DAI ENVIRONMENTAL

Environmental Engineers, Geologists and Scientists

Tel 847.573.8900
Fax 847.573.8953

Polo Park Business Center
27834 N. Irma Lee Circle
Lake Forest, Illinois 60045-5130

March 3, 2023

Mr. Renante Marante
City of Chicago Department of Public Health
333 South State Street, Room 200
Chicago, IL 60604

Re: Response to Deficiency Letter and Request for Additional Information
Application for Liquid Waste Handling Facility Permit
Green Era Renewable Energy and Urban Farming Campus
650 West 83rd Street
Chicago, IL 60620

Mr. Marante:

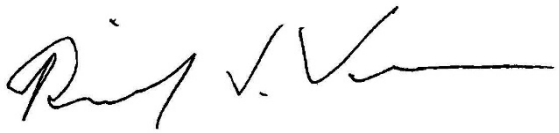
An *Application for Liquid Waste Handling Facility Permit* dated February 11, 2022, was submitted to the City of Chicago Department of Public Health (CDPH) for the Green Era Renewable Energy and Urban Farming Campus facility addressed at 650 West 83rd Street in Chicago, Illinois. In a letter dated June 2, 2022, CDPH provided a *Deficiency Letter and Requests for Additional Information* requiring response prior to CDPH approving the permit application.

On September 21, 2022, a *Partial Response to Deficiency Letter* was submitted to CDPH addressing certain items in the *Deficiency Letter*. For completeness purposes, DAI has chosen to include the September 21, 2022 Responses into this *Response to Deficiency*, but for clarity, we have indicated where the response is a reiteration of what was provided in the September 21, 2022 *Response* with notations, and by providing the responses that were provided in September 2022 in blue type.

This *Response to Deficiency Letter and Requests for Additional Information* is provided to CDPH as an addendum to the initial permit application. Direct responses to CDPH's comments are provided in Attachment 1. Updated and additional supporting documentation is also attached to this submission, as applicable. These include a revised SPCC Plan that is referenced in various documents, but for ease of your review, provided as a standalone attachment, and a revised Closure Plan.

If you have any questions or require additional information in regards to the review of the permit application and this addendum, please feel free to contact me at (847) 343-4257.

Sincerely,
DAI Environmental, Inc.



Richard J. Vamos, Ph.D., P.E.
Vice-President

Attachments
Attachment 1: Response to Requests for Additional Information
Attachment 2: Figures
Attachment 3: Fire System Schematic Drawings
Attachment 4: Electricity and Natural Gas Usage Calculations
Attachment 5: Traffic Study Report
Attachment 6: Environmental Reports-Various
Attachment 7: Geotechnical Engineering Report (October 22, 2018)
Attachment 8: Geotechnical Data Report (January 6, 2023)
Attachment 9: Potentiometric Surface Map (July 19, 2013)
Attachment 10: Inward Facial Velocity Calculations
Attachment 11: Laboratory Analytical Report (Groundwater Sampling)
Attachment 12: Secondary Containment Calculations
Attachment 13: Spill Evaluation, Spill Response SOPs, and Response Cost Backup
Attachment 14: PSA Sound Measurements
Attachment 15: SPCC Plan
Attachment 16: Closure Plan

cc: Ms. Erika Allen; Green Era (electronically, with Attachments)
Mr. Jason Feldman; Green Era (electronically, with Attachments)

ATTACHMENT 1
RESPONSE TO REQUESTS FOR ADDITIONAL INFORMATION

ADDITIONAL INFORMATION REQUESTED

1. *Pursuant to 8.4.4.9 of the Rules, provide the locations of all fire suppression equipment, including fire extinguishers, and all flammable material storage areas.*

Response: Attachment 2 provides an update to Figure 3A (originally provided in the February 2022 permit application) that addresses the requirement. Additionally, a process building detail is provided as Figure 3B. Both figures show the locations of fire extinguishers around the building, the location of the fire water system piping entering the building, and the location of the flammable material storage cabinet. Attachment 3 provides a fire pump detail and a schematic of the fire sprinkler system layout.

2. *Pursuant to 8.4.7.3 of the Rules, provide calculations demonstrating the peak electrical and gas demands for the proper operation of the liquid waste handling facility.*

Response: The requested calculations for natural gas and electricity are provided in Attachment 4 along with the utility applications and other pertinent information. Documentation that service accounts have been created by Peoples Gas and ComEd (i.e., application approvals) was previously provided.

3. *Pursuant to 8.4.9.1 of the Rules, provide description and specifications of the fencing surrounding the three sides of the Facility (e.g., height, material, screening, etc.).*

Response: The fence along the north and east boundaries of the facility is a 6-ft tall, chain-link fence.

The fence along the southern property boundary is 6-ft tall chain link fence with vertical post. The fencing along the southern boundary adjacent to West 83rd Street is more decorative than the chain-link fencing.

4. [The following is a restatement of what was provided in the September 21, 2022 Partial Response]. *Pursuant to 8.4.14 of the Rules, provide a demonstration that traffic generated by the Facility will not significantly affect existing traffic flows, and that the points of ingress and egress are designed according to Illinois Department of Transportation or Chicago Department of Transportation standards. Such demonstration shall include, but not be limited, to:*
   a. a stacking plan of all trucks and vehicles during the Facility's peak AM and PM traffic hour;
   b. a listing of roads and highways designated for use by traffic generated by the liquid waste handling facility; and
   c. a demonstration that traffic generated by the liquid waste handling facility will not interfere with the flow of traffic or exceed the intended level of service of any public way. Such demonstration shall include:
      i. traffic counts taken in hourly intervals at all ingress/egress points during the anticipated operating hours of the liquid waste handling facility. The entire operating period shall be represented in this traffic count study and shall identify the peak hours of traffic volume occurring in the morning and afternoon. The traffic counts shall include classification of vehicles.
      ii. a description of the measures taken to reduce the impact of the liquid waste handling facility generated traffic on the existing traffic flows.

Response: To address the multiple comments regarding traffic, Green Era engaged TERRA Engineering Ltd. to complete a traffic study. A copy of their Traffic Study report is provided in Attachment 5. Specific responses to the various items of requested information are provided below.

8.4.14.1. Calculations of the average and maximum number of vehicles generated by the liquid waste handling facility as well as hourly breakdown of vehicle traffic.

Response: Truck traffic at the facility is anticipated to include eight (8) to 16-loads/day of solid food waste, five (5) to 8-loads/day of pumpable food waste, two (2) loads/day for garbage compactor delivery/removal, and two (2) loads/day of finished product compost off-site shipment.

Approximately two (2) loads of palletized, packaged food is also anticipated. A worst-case peak scenario would be to have up to nine (9) trucks arrive and leave during the AM peak period via the east entrance and to have an additional eight (8) employees and four (4) volunteers arrive via the south entrance in the AM peak. While these values were used in the study for modeling purposes, it is expected the typical AM peak will be lower than this value. The average trucks expected during other non-peak hours is less than 5 per hour.

8.4.14.2. Diagrams of the points of ingress and egress depicting the layout of the ingress/egress points, sight distance, and improvements necessary to minimize accidents at the ingress/egress points.

Response: Figure 3A (previously submitted) in Attachment 2 provides the traffic flow directions in/out of the facility. The process building detail provided as Figure 3B in Attachment 2 also shows the truck routing.

8.4.14.3. A listing of roads and highways designated for use by traffic generated by the liquid waste handling facility.

Response: All truck traffic will use the eastern entrance/exit located on South Wallace Street (northeast corner of the facility). To reach the South Wallace Street entrance, trucks will proceed south from West 81st Street. The southern driveway that leads to West 83rd Street is for personal vehicles of facility personnel and public visitors. Personal vehicles would be expected to arrive from the west via West 83rd Street or from the south via South Birkhoff Avenue.

8.4.14.4. A stacking plan showing the number of waste handling vehicles and the location of these vehicles during the maximum peak service hour.

Response: During peak hours of truck traffic, trucks that do not immediately enter the Processing Building will stage outside the building on the asphalt paved driveway area. All trucks will remain covered at all times, except when unloading inside the closed Processing Building. No trucks will be allowed to lineup outside the facility property on either South Wallace Street to the east or West 83rd Street to the south.

8.4.14.5. A demonstration that traffic generated by the liquid waste handling facility will not interfere with the flow of traffic or exceed the intended level of service of any public street or right-of-way

Response: The traffic study conducted by TERRA Engineering Ltd., and documented in a Memorandum dated June 9, 2022 (see Attachment 5) concluded as follows:

Based on a review of the existing traffic data, estimated development trips, and other data it appears that the facility will not have a significant impact on the adjacent street network. The proposed facility is located on a low volume street in a mostly industrial area between two sets of rail tracks.

The Wallace Street and 83rd Street segments which are adjacent to the Green Era site have very low traffic volumes and the additional trips added from the site will not significantly impact these streets. Looking at how the additional trips impact the performance of the adjacent intersections, the low additional volumes created by the site have little impact on the intersection performance with all intersections operating at Level of Service (LOS) B or better. As these vehicles disperse throughout the roadway network further from the site the impacts will become less at each subsequent intersection that they pass through.

It is TERRA's opinion that the traffic generated by the site will not impact the intended Level of Service (LOS) of the public roadways and that no additional measures are necessary to mitigate traffic impacts.

As noted above, the maximum anticipated number of food waste trucks received in a day is 24. An additional one (1) to two (2) trucks may be expected daily for the exchange of compactor boxes. The trucks are anticipated to arrive across the typical operating hours of 7:00-17:00, Monday-Saturday. Peak operations are anticipated in the late morning to early afternoon. Other vehicle traffic will include a limited number of facility personnel vehicles, public visitors (little to none expected), and periodic deliveries or weekly municipal waste removal. The existing volume of traffic on South Wallace Street and West 83rd Street is low (see below). Traffic flow on West 83rd Street should not be impacted at all, with that entrance/exit expected to have minimal use. Traffic volume on South Wallace Street will increase, but the road is capable of handling the increased level of traffic based upon the minimal use of the roadway and the anticipated rebuild of the roadway by the City of Chicago (currently the street is more consistent with a gravel alley, not a public thoroughfare).

8.4.14.6. Traffic counts taken in hourly intervals at all ingress/egress points during the anticipated operating hours of the liquid waste handling facility. The entire operating period shall be represented in this traffic count study and shall identify the peak hours of traffic volume occurring in the morning and afternoon. The traffic counts shall include classification of vehicles.

Response: A traffic study was commissioned. The study was performed by TERRA Engineering Ltd. See Attachment 5 for the formal traffic study report.

8.4.14.7. A description of the measures taken to reduce the impact of the liquid waste handling facility generated traffic on the existing traffic flows.

Response: Based on the conclusions of the traffic study conducted by TERRA Engineering Ltd., the planned facility operations and schedule "…will not impact the intended Level of Service (LOS) of the public roadways and that no additional measures are necessary to mitigate traffic impacts." As such, no specific additional measures are proposed or viewed as necessary.

5. *Pursuant to 8.4.19 of the Rules, the Application must include a complete copy of the Environmental Assessment prepared pursuant to the Chicago Zoning Ordinance. Confirm that Terracon's Phase I Environmental Assessment, the Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan constitute said Zoning-required assessment. If not, please provide the correct report(s).*

Response: This response is provided to verify that the referenced reports that were previously submitted as part of the February 2022 permit application do meet the requirement for an environmental assessment. However, some supplement and more reports are being submitted as discussed below, to insure that CDPH has the complete set of reports.

The May 1, 2015, dated *Phase I Environmental Site Assessment* (Phase I ESA) prepared by Terracon Consultants, Inc. (Terracon) on behalf of the City of Chicago, and previously submitted to CDPH, detailed the site inspection and historical records review for the property and identified several recognized environmental conditions (RECs). (A copy of the more recent Phase I ESA dated March 10, 2020, completed by Terracon on behalf of Green Era Educational NFP, the property owner, is herein additionally provided as Attachment 6.)

To address the RECs identified in association with the property, Terracon was engaged by the City of Chicago (initially), and later by Green Era under the USEPA Brownfield Grant, to perform subsurface investigation and subsequent contaminant delineation. Subsurface investigations included the installation of numerous soil borings, four (4) monitoring wells, and four (4) soil gas sampling points. Details of the subsurface investigations were provided in the Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan (CSIR/ROR/RAP) dated May 29, 2015 (previously provided in the February 2022 permit application). The CSIR portion of the report provided a site characterization, a summary of subsurface investigation activities and results, and an endangerment assessment. The ROR portion of the report summarized all exceedances of the most stringent remediation objectives and provided results of fate and transport modeling as a demonstration of compliance with the exclusion of the groundwater ingestion rote of exposure. The RAP portion of the report proposed a combination of active remediation (e.g., chemical treatment and soil excavation) and institutional controls (e.g., engineered barriers and implementation of the City of Chicago groundwater use prohibition ordinance) to obtain a comprehensive No Further Remediation (NFR) Letter closing the site. The 2015 CSIR/ROR/RAP was approved by the Illinois Environmental Protection Agency (Illinois EPA) Site Remediation Program (SRP) in a letter dated August 20, 2015. Terracon later completed additional investigations on behalf of Green Era, and submitted the results of those additional investigations, as well as revisions to the RAP, to the Illinois EPA in a *Remedial Action Plan Addendum* dated January 21, 2020 (see Attachment 6). An additional *Supplemental Remedial Action Plan Information* (Supplemental RAP) as submitted to the Illinois EPA On April 5, 2021, to propose an alternative engineered barrier and to propose a design for the sealing of a sump in the lower level of the building (see Attachment 6). The Illinois EPA approved the Supplemental RAP in a letter dated May 24, 2021. Terracon subsequently completed the proposed Remedial Actions, including TCLP Lead "hot spot" remediation, remediation of a petroleum "hot spot," and installation of soil ingestion engineered barriers. Through that work, the RECs identified in the Phase I ESAs have been addressed. The only remaining "remediation" to be conducted is the final installation of soil ingestion engineered barriers at certain areas of the Site that have not

yet been fully constructed (for example, the Pole Barn area). Upon completion of engineered barrier installation, Terracon will seek the issuance of the final No Further Remediation (NFR) Letter for the Site through submission of a Remedial Action Completion Report (RACR) to the IEPA.

6. *Pursuant to 8.4.20 of the Rules, provide the locations of monitoring wells at the Facility designed to detect releases from the waste handling operations. Such information shall include, but not be limited to:*
   a. drawings indicating the location of all monitoring wells and piezometers;
   b. the construction details of the above wells and piezometers;
   c. a narrative explaining that the horizontal and vertical spacing of well screens are capable of detecting releases at the Facility; and
   d. a description of monitoring well abandonment procedures which detail any backfilling or sealing to prevent the abandoned well from serving as a potential contaminant pathway.

Response: Monitoring wells were previously installed on the property during environmental and geotechnical investigations. However, all monitoring wells previously installed have been abandoned or destroyed as a result of time and/or property redevelopment.

Therefore, to meet this requirement and as part of the requirements for a groundwater monitoring plan (per 8.5.10 of the Rules), new monitoring wells have been installed on-site. Per conversations with CDPH, five (5) temporary monitoring wells were initially installed for the purpose of verifying the groundwater flow direction. Temporary monitoring wells MW-101 to MW-105 were completed on September 23, 2022, by Terracon under the direction of DAI personnel as follows:

1. MW-101: Northwest corner of property
2. MW-102: South of eastern entrance drive; northeastern portion of property
3. MW-103: Northeast corner of on-site stormwater detention pond
4. MW-104: Southwestern corner of Processing Building
5. MW-105: Northwest corner of stormwater pond.

The locations of the temporary monitoring wells are shown in Figure 5. After allowing time for the wells to recharge and equilibrate, Terracon returned on September 30th to survey and collect static water level measurements. The measurements were utilized to determine the current groundwater flow direction below the facility. As shown in Figure 5, a northeasterly groundwater flow direction was observed.

With the groundwater flow direction confirmed, a permanent 2-in diameter monitoring well (MW-201) was installed on October 6, 2022 (see Figure 5). (Temporary monitoring wells were removed and abandoned with bentonite.) The location of the well is downgradient of the Processing Building operations in the approximate center-north of the overall facility. The well is also cross-gradient/downgradient of the outdoor storage tank and equipment area.

The well was installed in a manner consistent with Illinois EPA standard methodology. Based upon the depth to groundwater below the property, the monitoring well was completed to 15-ft below ground surface (bgs), constructed of 2-in diameter by 10-ft long factory-slotted PVC screen (0.010-in) attached to a 5-ft PVC riser pipe. The filter pack consisted of an artificially introduced sand pack extended to 1-ft above the top of the screen. Bentonite chips were used to backfill and seal each well up to 1-ft bgs. A locking flush-mounted well vault will be installed in concrete to secure and protect each well.

The well will remain in place for use during groundwater monitoring activities. If, at a point in the future, when monitoring is no longer required and/or the facility is closed, the well will be properly abandoned. Consistent with Illinois EPA accepted standard practices, the well vault will be removed, the PVC riser will be cut down below grade, the entire well and vault cavity will be filled with bentonite clay or concrete, and the casing will be capped with concrete. The surface material at the well location will then be generally matched (i.e., clean soil cover or pavement).

7. *Pursuant to 8.4.21 of the Rules, provide a comprehensive hydrogeologic investigation of the site and the surrounding area. Such investigation shall include all pertinent information required under 8.4.21.1 through 8.4.21.8 of the Rules.*

Response: The below information is provided to CDPH in response to the above comment and broken down by the requirements of 8.4.21.

8.4.21.1. A narrative describing the local and regional hydrogeology for the subject site.

As part of the environmental assessment activities conducted by Terracon, a hydrogeological evaluation of the subsurface soil and groundwater were completed. In addition to the environmental assessment, Terracon was engaged by Green Era Educational NFP to complete a geotechnical analysis of the property. Based upon review of the May 29, 2015, CSIR/ROR/RAP (previously submitted as Attachment 13) and the *Geotechnical Engineering Report – Revision 1* (Geotech Report) dated October 22, 2018 (previously submitted as Attachment 14 to the February 2022 *Liquid Waste Facility Permit Application*), the subsurface stratigraphy of the property consists of approximately 4-ft to 8-ft of mixed urban fill followed by silty sand, then clay to silty clay above bedrock (encountered at approximately 48-ft to 50-ft bgs). Terracon noted the depth to the upper-most water as observed in the soil was approximately 3-ft to 7-ft bgs, and the observed depth to water in the monitoring wells was 6.39-ft to 7.21-ft bgs. Based upon the groundwater level measurements, a southeasterly groundwater flow direction is noted, with a hydraulic gradient of 0.001. Previous hydrogeological slug testing performed by Terracon as part of the initial Site Investigation (on a previously installed monitoring well no longer present) indicated a hydraulic conductivity of 2.7×10^{-3}-cm/s, consistent with the observation of sandy soil below the fill material.

8.4.21.2. Logs of all soil borings taken at the facility. Sufficient site-specific hydrogeological information shall be obtained to verify that hydrogeological conditions will protect the public health, safety and welfare. All borings shall be continuously sampled in accordance with appropriate testing standards and shall be retained for City inspection until such time as a permit has been issued. The boring logs shall provide an accurate depiction of the site geology extending down to the bottom of the uppermost aquifer or 20 feet below the surface or bedrock, whichever is shallower.

The previously submitted Terracon CSIR/ROR/RAP included (in Appendix B of that report) soil boring logs for the 89 soil borings completed during environmental Site Investigation activities. The environmental soil borings were completed to a depth of between 4-ft and 24-ft bgs, with most boring completed to either 16-ft or 24-ft bgs. Subsequently, as part of the predevelopment investigations, a total of 20 geotechnical soil borings were installed by Terracon. Those boring logs were included in the previously submitted Geotech Report, but are provided again here as Attachment 7, as these were the more current and complete logs that are representative of the property.

8.4.21.3. Sufficient regional geologic information to correlate the on-site data to the surrounding off-site area.

Based on a review of the Bedrock Geology of Illinois map, most recently compiled in 2005 by the Illinois State Geological Survey (ISGS), the bedrock material beneath the general area is expected to be various dolomite types within the Silurian System. This information is consistent with the description included in the Terracon CSIR/ROR/RAP.

According to the ISGS "Quaternary Deposits of Illinois," by J. A. Lineback (1979), the local area is mapped as being part of the Dolton Member of the Equality Formation. The Equality Formation is described as “Lake deposits; offshore deposits of silt and clay; sand facies near shorelines.” The Dolton Member more specifically notes, “Largely shallow-water, nearshore lake sediments in beaches, bars, spits, and deltas; includes some former lakes that contain coarse-grained deposits; dominantly medium-grained sand; some gravel along beaches; contains beds of silt where gradational with the Carmi Member.”

Based upon review of the Terracon soil borings logs and summarized subsurface stratigraphy of sand over clay to silty clay (to a depth on the order of 50-ft below ground surface) over limestone bedrock, the on-site stratigraphy is consistent with the area stratigraphy. The only deviation from historical geological mapping is the observation of mixed urban fill material overlaying the native soils.

8.4.21.4. A minimum of two cross-sections through the site, extending 500 feet beyond the property boundary and to the bottom of the uppermost aquifer or 10 feet below the tip of bedrock, whichever is shallower. Existing, published information may be used. At least one cross-section shall be perpendicular to the other cross-sections. The cross-sections shall indicate the geologic units under the site; the water table; the uppermost aquifer's potentiometric surface; pits, tanks, and treatment units; and the property boundary.

Figures 6A and 6B in Attachment 2 provide the two (2) required stratigraphic cross-sections. Figure 6 provides the overview figure for the cross-sections.

8.4.21.5. The results of all soil tests performed on samples taken from borings. All tests shall be conducted according to appropriate testing standards and results reported according to the same testing standards. Soil tests shall include, but not be limited to:

As part of pre-redevelopment of the Green Era Site, Terracon conducted a Geotechnical Investigation of the Site in 2017 and 2018, the results of which were summarized in a Geotechnical Engineering Report dated October 22, 2018 (see Attachment 7). As part of the original geotechnical investigation, a total of 20 geotechnical soil borings were completed by Terracon using hollow stem augur drilling method. Certain of the information required by CDPH was collected during the geotechnical soil borings. As part of the above-discussed and recent installation of monitoring well MW-201, additional soil geotechnical samples were collected towards obtaining the additionally required information. A discussion of previous and recently completed geotechnical testing is provided below.

Atterberg Limits - minimum one test for each auger boring, including a representative of each unconsolidated material type present on site.

Atterberg limits results were collected on soil borings B-1 to B-3 (see logs in Attachment 7). The Atterberg limits were collected on the native lean clay soil first encountered at approximately 8-ft to 9-ft bgs, the first fine-grained soil observed in the subsurface. An urban fill layer generally extends at the Site from the surface to approximately 6-ft to 7-ft bgs, followed by a silty sand, the uppermost water-bearing unit.

Although Atterberg limits were not collected on all 20 of the original geotechnical borings, the data from B-1 to B-3 were rather consistent and should be applicable to all soil borings based upon the consistency of the observed subsurface stratigraphy across the property. No further testing for Atterberg limits was performed. The reported Atterberg limits were as follows:

Soil boring	Depth Interval	Soil Type	Atterberg Limits (LL-PL-PI)
B-1	13.5-15	Lean clay	34-16-18
	18-20	Lean clay	27-15-12
B-2	8.5-10	Lean clay	36-17-19
	13.5-15	Lean clay	36-15-21
	23.5-25	Lean clay	34-16-18
B-3	13.5-15	Lean clay	36-16-20

Moisture Content - minimum one test for each sample taken from every boring.

As observed on the soil boring logs included in Attachment 7, moisture content was collected for each soil sample collected during geotechnical evaluation of the property. The results ranged from 5 to 46% (excluding the samples of dolomite bedrock), with the majority of readings in the mid-teens to mid-30s.

To obtain additional geotechnical information as required by CDPH, Terracon was further engaged to conduct a limited additional geotechnical investigation. The results of that additional investigation are summarized in a *Geotechnical Data Report* dated January 6, 2023 (see Attachment 8). Terracon collected soil samples from one (1) geotechnical boring referred to in the report as B-1 and MW-B1 (same location as the above-discussed permanent 2-inch diameter monitoring well MW-201).

The soils observed at the boring location consisted of 7-inches of topsoil underlain by fill soils consisting of lean clay followed by buried topsoil. The fill soils extended to a depth of about 7-feet. Below the fill soils, we observed native lean clay soils, gray to brownish gray until the termination depth of the boring. The silty sand layer observed across much of the property was not encountered during the installation of MW-201. The moisture content in the boring ranged from 13.2 to 30.7%, with the native clay soil reported with moisture ranging between 22.7 and 30.7%. The moisture content readings are provided on the boring log included in the report provided in Attachment 8.

Ion Exchange Capacity - minimum one test for each boring, including a representative of each unconsolidated material type present on site, conducted in accordance with the American Society of Agronomy Method, using a one normal solution of NH4 aqueous at pH 7.0 +/- 0.1.

No sampling for ion exchange capacity was performed during the initial geotechnical analysis. To meet the requirement for ion exchange capacity, Terracon's 2022 geotechnical investigation included collecting samples from 5-ft to 8-ft bgs (bottom of fill layer from 5-7-ft, transitions to lean clay at 7-ft bgs) and 13-ft to 15-ft bgs (lean clay). As reported in Attachment 8, A&L Great Lakes Laboratories, Inc. reported 8.71-meq/100-g and 5.95-meq/100g, respectively for the Cation Exchange Capacity (NH_4-Sat).

Hydraulic Conductivity (permeability) - minimum one test for each boring to include each unconsolidated material found at the site. Vertical and lateral hydraulic conductivity testing shall be performed for in-situ soils. For placed and compacted liners, hydraulic conductivity testing shall be performed on the soil mix to be used for the liner. Samples taken for laboratory hydraulic conductivity testing shall be obtained by thin-walled (Shelby) tubes (minimum 3-inch diameter).

The lateral hydraulic conductivity of the uppermost water-bearing unit (silty sand) below the property was determined by Terracon during Site Investigation activities via the performance of a slug test on a monitoring well installed near the northwestern property corner during environmental Site Investigation activities. The calculated lateral hydraulic conductivity reported by Terracon in the 2015 CSIR/ROR/RAP was 2.7 x 10^{-3}-cm/s. However, slug testing of the recently installed

MW-201 by Terracon (see Attachment 8) indicated a hydraulic conductivity of 8.7 x 10^{-5}-cm/sec. The calculated conductivity is representative of groundwater in the native clay stratigraphy, not the higher conductivity reportedly associated with the silty sand layer in 2015 (which was not observed during the installation of MW-201).

In addition to lateral hydraulic conductivity, vertical hydraulic conductivity (i.e., permeability) was determined on samples collected at 8-ft to 10-ft bgs and 14-ft to 16-ft bgs (both within the native clay underlying the mixed fill). The results (see Attachment 8) of the permeability measurements were 1.71 x 10^{-7}-cm/sec (8-10) and 5.07 x 10^{-8}-cm/sec (14-16), consistent with the typical vertical hydraulic conductivities of clay soils (1 x 10^{-7}-cm/sec or less).

> *Standard and Modified Proctor - minimum one test for each boring to include the materials to be used in the construction of the liner bottom and side slopes as well as each unconsolidated material found at the site.*

No liners are installed at the Site. The native clay underlying the property will act consistent with characteristics of landfill liner. Proctor testing was performed during the most recent geotechnical investigation (none performed during the initial geotechnical investigation) on the native clay from samples collected at 11-ft to 13-ft and 13-ft to 15-ft bgs. The results of the native clay proctor testing are included in Attachment 8.

> *Shear-Strength - minimum one test for each boring to include the materials to be used in the construction of the liner bottom and side slopes as well as each unconsolidated material found at the site.*

There are no liners installed at the site. But to meet the listed requirement for shear-strength testing, samples were collected from the clay soils underlying the surficial fill at the Site from boring MW-201 and subjected to a shear strength test (see Attachment 8).

> *Compressibility - minimum one consolidation test for each boring to include each unconsolidated material found at the site.*

Information on unconfined compressive strength is included on the soil boring logs provided in Attachment 7 for the following: B-1 (18-ft to 20-ft bgs), B-13 (13-ft to 15-ft bgs), B-15 (18-ft to 20-ft bgs), and B-19 (18-ft to 20-ft bgs). All samples were collected from the lean clay layer. The results are summarized as follows:

Soil boring	Depth Interval	Soil Type	Unconfined Compressive Strength (tons/ft^2, tsf)
B-1	18-20	Lean clay	5.06
B-13	13-15	Lean clay	1.06
B-15	18-20	Lean clay	1.85
B-19	18-20	Lean clay	2.03

Additionally, an unconfined compression test of the underlying native clay soils collected from boring MW-201 was conducted by Terracon in the most recent investigation (see Attachment 8

for results). An unconfined compressive strength test was completed on a sample of the brownish gray clay yielding an unconfined compressive strength of 0.94-tons/ft^2. Note that unconfined compressive strength tests cannot be performed on silty sand or the mixed urban fill overlying the silty sand.

Grain size analysis - minimum one analysis for each boring and each soil type classified in the field.

The soil boring logs included in Attachment 7 provide a stratigraphic description consistent with the Unified Soil Classification System (USCS). The USCS provides the grain size ranges based upon soil type (e.g., sand = 4.75-mm to 0.075-mm). A soil boring log was completed for each of the 20 soil borings that includes a description of the soil stratigraphy, and therefore, information on grain size has been provided.

In addition to the general grain size description as interpreted from the previous soil borings, samples from 5-ft to 8-ft bgs (bottom of fill layer from 5-7-ft, transitions to lean clay at 7-ft bgs) and 13-ft to 15-ft bgs (lean clay) were collected from soil boring MW-201, and submitted for grain size distribution analysis. The graphical depiction of results is included in Attachment 8.

8.4.21.6. Four potentiometric surface maps of the uppermost aquifer corresponding to four consecutive quarters of potentiometric surface measurements.

The Terracon CSIR/ROR/RAP included a map of groundwater monitoring wells and flow direction based upon measurements collected on July 19, 2013. A copy of the Terracon potentiometric surface map is provided in Attachment 9. A southeasterly groundwater flow direction was observed. All previous monitoring wells have been destroyed as a result of time and/or property redevelopment activities.

Per discussions with CDPH, in lieu of the requirement for potentiometric surface maps representing four (4) quarters of time, the current groundwater flow direction below the facility was to be determined from the five (5) temporary monitoring wells installed in September 2022, and that groundwater flow direction was used to determine the placement of the permanent monitoring wells that would be used as part of the required ongoing groundwater monitoring (per 8.5.10 of the Rules). The potentiometric surface map completed from the September 30, 2022, measurements is provided as Figure 5 (see Attachment 2).

8.4.21.7. An analysis of the rate and direction of the flow of groundwater in the uppermost aquifer.

As noted, a southeasterly groundwater flow direction under a hydraulic gradient of 0.001 was observed by Terracon during environmental Site Investigation activities (see potentiometric surface map in Attachment 9). The September 30, 2022, potentiometric surface map (see Figure 5 in Attachment 2) shows a northeasterly groundwater flow direction under a hydraulic gradient of 0.0014 ((9.6-8.7)/655).

8.4.21.8. An analysis of the potential contaminant migration pathways that may exist in the geologic structures surrounding the facility.

The facility is being constructed within a developed, urban area. Potential migration pathways associated with this facility are:

- Lateral dispersion through the silty sand water-bearing unit;
- Migration through the underground utility corridors located both on-site and off-site; and
- Discharge into the combined sewers.

Vertical migration should be minimized (or fully eliminated) by the native clay soil unit underlying the silty sand and extending to a depth on the order of 50-ft bgs (below which is limestone bedrock). Containment and a commitment to rapid response should help minimize spread of contamination through subsurface utilities and/or into the sewer system.

8. *Pursuant to 8.5.8 of the Rules, provide a demonstration that the building's HVAC system can maintain adequate negative pressure to prevent odors from escaping the building untreated. Such demonstration shall include sensitivity calculations of inward facial velocities ranging from a conservative scenario assuming all doors and windows open, versus a more likely situation of only a limited number of overhead doors open to accommodate daily peak deliveries and shipments.*

Response: There are a total of nine (9) large overhead roll-up doors for truck entrance/exit (14-ft wide x 18-ft tall), two (2) slightly smaller overhead roll-up doors for compactor box in/out (10-ft wide x 14-ft tall), a small overhead roll-up door at the truck dock and for the boiler room (9-ft wide x 10-ft tall), eight (8) standard man doors (3-ft, 4-in wide x 7-ft, 2-in tall), and one (1) double man door. All of these openings will remain closed except when vehicles/personnel are going in or out. There are no windows on the building. Attachment 10 includes a schematic depicting all of the building openings.

Other penetrations through the building wall are connected to HVAC duct in/out of the building (i.e., not openings). Two (2) air handlers located outside the east wall of the building supply air to the Processing Building, and two (2) vacuum blowers extract air from the building for treatment by the odor control system located outside the west wall of the Processing Building. The SCADA system that will control the process air handling system will be set to modulate the supply fans and the exhaust fan speeds so as to maintain a minimum face velocity or building negative pressure when doors are opened. The control strategy can be customized for different operating conditions as needed.

In addition to specifying that the inlet and outlet air handlers will be continuously operated and appropriately controlled by the SCADA system, facial velocity calculations have been performed that demonstrate the building will maintain an adequate negative pressure to prevent the escape of odors. Calculations are provided in Attachment 10. Five (5) different scenarios are provided in the Attachment 10 calculations, including a scenario when all overhead doors are open at the same time as directed. The calculation scenarios are as follows:

- Typical operations: one (1) large overhead door open; all other doors closed;
- Possible, but operationally restricted: two (2) large overhead doors open; all other doors closed;
- Possible, but operationally restricted: one (1) large and one medium overhead door open; all other doors closed;
- Possible, but operationally restricted: two (2) large overhead doors, one (1) medium overhead door, and one (1) compactor box overhead door all open; all other doors closed; and
- Unrealistic scenario that will never occur: all doors open.

9. *Pursuant to 8.510 of the Rules, provide a ground water monitoring plan addressing all the information requirements set forth in paragraphs 8.5.10.1 through 8.5.10.7 of the Rules.*

Response: The below information is provided to CDPH in response to the above comment and broken down by the requirements of 8.5.10.

8.5.10.1. A listing of constituents monitored at each monitoring point.

The facility will not be accepting or storing hazardous liquids. All imported waste materials will be food waste, for which there are no specific contaminants of concern. No storage or handling of other hazardous materials will be performed at the facility. Therefore, groundwater monitoring for general groundwater quality parameters will be performed at this facility judged to be indicative of possible impacts of a feed waste recycling facility, including: total Kjeldahl Nitrogen (TKN), pH, biochemical oxygen demand (BOD), and chemical oxygen demand (COD). Baseline sampling of monitoring well MW-201 was completed on October 26, 2022. A copy of the laboratory report with analytical results is provided in Attachment 11. The results of future quarterly monitoring for the same parameters will be compared to these initial results to assess for potential signs of impacts of the operations on the groundwater quality. While quarterly monitoring will be performed as required, it should be noted that groundwater is prohibited from use as potable water source in the City of Chicago by ordinance.

8.5.10.2. All documentation used to determine the list of constituents and the maximum allowable predicted concentration (MAPC) of each constituent at each monitoring point.

Response: As noted above, there are no specific contaminants of concern associated with the non-hazardous food waste to be accepted by the facility. The constituents of TKN, pH, BOD, and COD were selected as they are judged to be indicator contaminants of subsurface impacts if operations results in spills of organic and nitrogen containing solids or liquids on the Site, such that they could have potentially impacted the groundwater. Of the constituents to be monitored for, only pH has a groundwater quality standard (6.5-9) listed in 35 IAC 620.410. This pH range will be used as a maximum allowable predicted concentration (MAPC). TKN, BOD, and COD have no listed groundwater standard. Therefore, the pre-operation groundwater concentrations observed in the sample collected from MW-201 on October 26, 2022, have been used to establish MAPCs for TKN, BOD, and COD (the idea being that concentrations markedly higher than the pre-operation

baseline concentrations would be indicative of potential impacts to the groundwater by the operations). The sampling parameters and MAPCs are summarized below.

Parameter	Pre-operation sampling results	MAPC	Justification
pH	7.44	6.5-9	35 IAC 620.410(e)
TKN	5.94-mg/L	10.4-mg/L	75% increase
BOD	<15-mg/L	26.25-mg/L	75% increase
COD	49.8-mg/L	87.15-mg/L	75% increase

8.5.10.3. The schedule for sampling all monitoring wells including the constituents monitored during each routine sampling event.
8.5.10.4. Reporting requirements for quarterly groundwater samples. The quarterly monitoring results shall be provided to the Department of Environment. The quarterly submittal shall include a summary table that includes the results of the current monitoring results from the three previous monitoring events, the MAPC for the specific well, and the applicable groundwater quality standard (AGQS) for each constituent.

Response: To meet the requirements of 8.5.10.4, quarterly sampling of MW-201 is proposed for the first year of operation. Quarterly sampling is planned to be performed during the middle month of the quarter (i.e., February, May, August, and November), with groundwater analyses consisting of the same four (4) pre-operation parameters noted above. The quarterly report will be submitted within 60-days of receipt of groundwater monitoring data. The report will include a historical summary of sampling (4-quarters minimum) in comparison to the initial baseline results (pre-operation) and to the proposed MACP. If quarterly sampling from the first year of operations indicate that there is no adverse impact to groundwater, a reduction in sample frequency to semi-annual sampling will be requested.

8.5.10.5. Procedures for verifying and reporting exceedances of MAPCs or AGQCs including procedures and schedule for the design and implementation of remedial actions in the event of a verified exceedance.

Response: The reported groundwater concentrations will be compared to the proposed MACPs. Any exceedances of the MACPs identified as a result of groundwater monitoring will be reported to CDPH as part of the post-sample reporting. The post-sample reporting will include an evaluation of the cause of the exceedance and any remedial steps taken/to be taken. If evaluation and remedial actions are yet to be completed, a schedule of activities will be included in the report.

8.5.10.6. A requirement that copies of all documentation sent to the IEPA related to confirmation of monitored increase, assessment monitoring, assessment of potential groundwater impact, and remedial action be sent to the Department of Environment.

Response: Upon final construction of the facility, Terracon will be submitting a Remedial Action Completion Report (RACR) to Illinois EPA seeking issuance of an NFR Letter. Copies of the RACR, NFR Letter, and any other correspondence with Illinois EPA will be provided to CDPH. If required, copies of reporting to Illinois EPA associated with the land and air permits to be issued for the facility will also be provided to CDPH.

8.5.10.7. A description of the groundwater sampling procedures, including sampling equipment to be utilized.

Sampling of monitoring well MW-201 will be completed during a ½-day event once a quarter. The groundwater level measurement will be obtained using a water level indicator, and a disposable PVC bailer or peristaltic pump with dedicated tubing will be utilized to collect samples from the monitoring well. All samples will be distributed directly into laboratory-provided sample containers and be placed into a cooler on ice pending submission to a commercially independent, Illinois certified analytical laboratory. Disposable gloves will be used during sampling, and all equipment used during the sampling will be decontaminated prior to use to prevent cross-contamination.

10. [The following is a restatement of what was provided in the September 21, 2022 Partial Response]. *Pursuant to 10.6 of the Rules, provide the following information for the Phase I and Phase II biogas flares, thermal oxidizer, odor control exhaust, and all vent stacks from the biomass and digester tanks:*
    a. location in Universal Transverse Mercator (UTM) coordinates,
    b. stack diameter in meters,
    c. stack height in meters,
    d. exit temperature in Kelvin,
    e. exit velocity in meters per second, and
    f. PM 2.5 emission rate is grams per second.

Response: The below table summarizes all the CDPH requested information. Note that there are no vent stacks from the biomass and digester tanks. Biogas generated within the tanks is collected by the biogas upgrade system, with final emissions to the atmosphere via the flare and thermal oxidizer. Instead of tank vents, the information for the emergency pressure relief valves for each tank are provided. No particulate matter emissions are expected from and of the equipment. Per AP-42 Table 13.5-1, Footnote D, soot is zero for non-smoking flares. This same consideration is assumed to apply to the thermal oxidizer. The odor control system and tanks are not sources of particulate matter emissions.

Equipment	UTM	Diameter (m)	Height (m)	Temperature (°K)	Velocity (m/s)	$PM_{2.5}$ (g/s)
Flare	446750.59 E 4621629.67 N	1.43 (56.3-in)	7.47 (24.5-ft)	1,033.15 (1,400°F)	4.56-5.60 (14.69-18.36 FPS)	0 (none anticipated)
Flare (Phase II)	446755.24 E 4621628.41 N	TBD (See Note 1)				
Thermal oxidizer	446745.28 E 4621630.6 N	0.50 (19.75-in)	3.94 (12.92-ft)	1,060.93 (1,450°F)	6.43 (21.1 FPS)	0 (none anticipated)
Odor control system exhaust stack	446667.82 E 4620498.11 N	1.17 (46-in)	7.32 (24-ft)	288.71-297.04 (60-75°F)	18.54 (60.83 FPS)	0 (none anticipated)
Biomass tank emergency pressure relief valve	446692.84 E 4621657.19 N	0.61 (24-in)	16.31 (53.5-ft)	324.82 (125°F)	See Note 2	0 (none anticipated)
Digester tank emergency pressure relief valve	446745.28 E 4621630.60 N	0.61 (24-in) & 0.25 (10-in)	16.31 (53.5-ft)	324.82 (125°F)	See Note 2	0 (none anticipated)

Note 1 – The need for a second flare will be determined in the future by extrapolating Phase I actual facility operations into expanded Phase II operations. There are no plans to install a second flare at any point in the near future. Any modeling of operating conditions with a second flare should be completed by utilizing the operating parameters of the existing flare. If a second flare is required in the future, all required information will be provided as part of a permit modification.

Note 2 – The 24-in pressure/vacuum vents are designed for a flow rate of 350,000-SCFH pressure/50,000-SCFH vacuum. The 10-in pressure/vacuum vent is designed for a flow rate of 265,353-SCFH pressure/91,100-SCFH vacuum. Velocity information is not provided on the manufacturer's documentation; velocity in/out of the vents is 0-m/s except in the event of emergency.

11. *Pursuant to 11.8 of the Rules, provide a secondary containment plan that retains the volume of the largest tank plus precipitation from a 25-year, 24-hour rainfall event, using the latest Illinois State Water Survey Bulletin 70 precipitation data. The secondary containment installation shall allow for the complete and timely removal of any spilled waste or other materials. The Applicant may propose using the basement and detention pond for secondary containment storage. However, such proposal shall demonstrate that the required secondary-storage volume will be fully contained within the property, and at a minimum include the following information:*
    a. a topographic map depicting the flow paths of liquids or material from the spill source to all receiving collection points, and the extent of inundation of the property from a spill equal to the required secondary containment volume;
    b. a written approval from the Chicago Department of Buildings authorizing the complete flooding of the basement for temporary secondary containment storage;
    c. a description of procedures to promptly close off all detention pond outlets in an event of a catastrophic spill; and
    d. a cost estimate, detailed procedures, and timeline for the prompt removal of all spilled and contaminated materials, as well as the thorough cleaning of impacted surfaces and equipment.

Response: To meet the requirements for secondary containment, most storage tanks at the facility are located inside of the Processing Building. The building has a lower level with cast-in-place concrete walls and floor. No trench or floor drains within the processing area of the building are connected to sanitary sewers. All trench drains and sumps within liquid storage areas direct captured liquids back to the two (2) liquid receiving tanks. The stormwater sump in the northwest basement floor is sealed closed, preventing any material spilled into the basement from subsequently pumping out of the building into the on-site stormwater sewer system. The main floor of the building is concrete slab and building walls are pre-cast concrete construction. These tanks are not exposed to precipitation

As presently constructed, the facility does not have the ability to provide secondary containment capable of managing the catastrophic release: the full 1,680,000-gallons capacity of the Digester Tank and the additionally required freeboard of the 25-yr, 24-hr storm (5.7-in). Therefore, the property to the north of the facility will be leased or acquired by Green Era, with the intent to allow for the design and build of appropriately sized secondary containment. Engineering design work is presently being performed to develop the appropriately sized secondary containment sufficient to manage the full capacity of the Digester Tank and the 25-yr, 24-hr storm (5.7-in). Until such time as the full secondary containment is in-place, the Digester Tank operating volume will be limited by the City of Chicago Liquid Waste Handling Facility permit to a maximum of 602,057-gallons, which is based upon the presently available secondary containment provided by the on-site stormwater detention basin (656,692-gallons) plus the on-site sewer system (24,738-gallons) minus 79,373-gallons of precipitation generated within the first 15-minutes of a 2-yr storm (after which high volume recovery efforts can be initiated). The detention basin has the volumetric capacity to hold the entire volume of the Biomass Equalization Tank (320,000-gallons). Attachment 12 provides the requested "*topographic map depicting the flow paths of liquids or material from the spill source to all receiving collection points, and the extent of inundation of the property from a spill equal to the required secondary containment volume"* and supporting

engineering calculations establishing the available containment and Digester Tank restriction volume. Attachment 12 also includes the City of Chicago Department of Buildings approval (addressing CDPH's request for "written approval" of a plan).

Because the current secondary containment for the facility relies upon active response activities beginning quickly in the event of a release, a detailed *Spill Evaluation* narrative has been included in this submission in Attachment 13. The narrative provides a description of facility storage, liquid level controls, available containment, and possible release scenarios. Additionally included in Attachment 13 are standard operating procedures (SOPs) that summarize the proposed spill response actions to be taken by the facility (SOP-21-009) and procedures to safely allow the temporary filling of the lower level of the building with spilled digestate and storm water (mixture) (SOP-21-010).

But for convenience in your review, and to address CDPH's request for "*detailed procedures, and timeline for the prompt removal of all spilled and contaminated materials, as well as the thorough cleaning of impacted surfaces and equipment",* the key aspects of the response plan and procedures are additionally summarized below.

In the event of a large volume release, a normally-open plug valve at the detention pond catch basin CB13 will be closed, temporarily converting the detention pond into a retention basin that will prevent a release from the pond into the sewer system. Additionally, backflow preventers have been installed in the on-site sewer lines that are hydraulically connected to the pond, so that rising liquid levels in the pond will not backflow out the pond through the on-site sewers as the level rises. The engineered grading of the facility in combination with a diversionary berm installed along the northern property boundary ensure that release from either of the outdoor storage tanks flows to the east and south, either overland into the on-site detention basin or into on-site sewers that drain to the detention basin. The adjacent elevated railway embankment to the west will prevent any westerly flow of a release. (Note that the diversionary berm to the north will later be removed as part of the full-capacity secondary containment basing being designed for construction on the property to the north).

The plug-valve will not be re-opened until the full volume released (maximum 602,057-gallons), plus the projected potential storm water volume that might reach the detention pond during the response activities (79,373-gallons), is pumped from the pond and sewer system into the basement of the Processing Building (647,035-gallons capacity) and spare sub-grade concrete storage tanks (additional 65,743-gallons). The combined capacity of the basement and spare tanks is 712,778-gallons, capable of holding 100% of the restricted digester operating capacity plus the 79,373-gallons of precipitation, with an excess capacity of 31,348-gallons. The transfer of the spilled material into the basement will be accomplished using three (3) diesel powered 1,250-GPM pumps (total capacity of 3,750-gpm) that will be maintained on-site at all times. The combined 3,750-gpm pumping capacity has the ability to pump out the full volume of the closed-off detention pond in approximately 3-hrs.

A general description of the steps and procedures to be followed (taken from SOP-21-009) is as follows:

Spilled sludge on the site will flow to the stormwater detention pond through the stormwater drainage system. The normal outfall of the detention pond (at CB13) is an 8-inch diameter outfall to the combined sanitary/storm sewer from a manhole at the southeast corner of the site. A pond overflow outfall (STM MH8) is also present along the southern boundary of the detention pond.

To prevent any sludge or sludge and stormwater from entering the combined sewer, the plug valve at CB13 at the outfall from the detention pond should be manually closed. To close the plug valves, use a valve wrench to turn the valve clockwise until the plug seats. A valve wrench will be stored at all times in a labeled and capped PVC pipe at the fence for emergency use.

Notify the Operations Manager that the plug valve has been closed and any other authorities. Leave the valve wrench on the valve.

The Operations Manager will direct on-site personnel to mobilize the on-site high-capacity diesel powered recovery pumps, and initiate the pumping of accumulated liquid from the detention pond to the lower level of the building. Locate the pump in an area adjacent to the pond that is accessible and can be reached with 24' of suction hose. Attach the suction hose to the inlet of the pump with the quick coupler. Layout the dragline hose from the pump to the building using a telehandler or skidsteer to manage the reel. Couple the hose to the discharge side of the pump. Place the discharge end of the hose in the grit tank so the pumped flow can be contained and stilled prior to overflowing into the pit. Snake any excess length in the yard so it isn't pinched. Once the pumps and hoses have been positioned at the pond, but prior to initiating pumping, ensure that the procedures specified in SOP-21-010 Flooding Lower Level of Process Building have been completed. Then, initiate pumping by following the procedures on the pump skid to start the pump. Continue pumping until the recoverable liquids and sludge in the pond have been removed or the lower level detention area is full.

Upon completion of the removal of spilled digestate from the detention pond and any other areas on Site that could discharge to the detention pond, open the plug valves at the outlets of the storm water detention pond, so that the pond can function as primarily designed (i.e., to convey storm water in a controlled manner from the Site to the sewer system).

Other Cleanup Activities

Once the plug valve of the outfall of the detention pond has been opened, additional cleanup activities will be conducted, as follows (taken from SOP-21-009):

Perform Additional Site Cleanup Activities

Use water to irrigate areas with accumulated sludge and use pumps or vac trucks to remove wastewater from low areas or temporary sump pits.

Spills on impervious (paved) surfaces

Use rubber squeegees, brooms and flat scoop shovels, to remove bulk material from paved areas and roadways. Push to an area where bulk material can be contained and removed. After removing bulk sludge from the paved surface, flush the surface with fresh water after a spill to clean. A pressure washer service or vac truck with water on board may be used effectively depending on the spill type.

Spills on aggregate (stone)

For areas with compacted stone or gravel, irrigate with a fire hose to flush solids towards temporary sump pits and use a vac truck to remove surface water.

Spills on vegetated surfaces outside detention pond

Use a fire hose with a flat low velocity spray to wash any ponded sludge towards low spots or temporary sump pits to recover additional wastewater. Plant seasonal rye grass or other grass covers in areas with disturbed soils. Erect silt fencing until grasses establish to mitigate solids runoff.

Off-Site Disposal of Recovered Liquid and Sludge

The preferred disposal location of the recovered liquid and/or sludge is the MWRD Calumet Water Reclamation Plant, which has a High Strength Organic Materials (HSOM) acceptance program. However, in the event the recovered digestate cannot be sent to the MWRD, the following facilities are located within a reasonable distance from the Site and could be used as alternate disposal options to the MWRD Calumet Plant:

Liquid Environmental Solutions; Chicago, IL (866-694-7327)
Circon Environmental (formerly Beaver Oil); Hodgkins, IL (219-881-9234)
Circon Environmental (formerly Water Integrated Treatment Systems); Dolton, IL (708-880-0400)

Finally, another potential destination for the recovered digestate would be at land application (agricultural) sites, though given the further travel distance, closer, more cost-effective options would be initially utilized.

As discussed further below, an allowance for 5-days use of heavy equipment and operator (CAT 330 Excavator) is included to clear debris and materials to allow the emergency response work to proceed, to perform any trenching or excavation work to support the liquids recovery, and to load any solid waste into trucks if off-site disposal of any solid waste materials is necessary.

Spilled Digestate Recovery and Disposal Costs

To address CDPH's request for "*a cost estimate…for the prompt removal of all spilled and contaminated materials, as well as the thorough cleaning of impacted surfaces and equipment*", the costs to recover and dispose the digestate and possible storm water that would need to be managed in the event of a catastrophic spill, were calculated as follows:

- As per the methodology and calculations provided in Attachment 12, the combined volume of spilled digestate plus potential storm water to be pumped out of the detention pond is 681,430-gallons.

- The pumps are maintained on site, and can be operated by facility personnel, and as such, there are no allocated costs to the acquiring, mobilizing, or operating the pumps.

- A unit cost of $0.13/gallon is assumed to recovery the liquid from the basement of the building via vacuum trucks, and to transport and dispose at the MWRD's High Strength Organic Materials (HSOM) facility at their Calumet WWTP. This combined unit cost is justified as follows:
    - Vacuum Trucks are estimated at $159/hr, assume 3-trucks, 9-hrs/day, 3-hrs to make turn; 5,500-gal/turn; this totals to $64,395 ($0.095/gallon). MWRD "tip fees" under HSOM program are $0.03/gallon, and with inflation and rounding up, comes to $0.13/gallon)
- Based on the above, the 681,430-gallons of combined digestate plus storm water can be disposed off-site for a cost of $0.13/gallon x 681,430-gallons = **$88,586**

Other Cleanup and Response Costs

The following assumptions and cost references were used to estimate the additional cleanup and response costs:

- It is assumed that 60,000-gallons of additional liquids will be recovered as a result of pumping from low-lying accumulation areas, or generated by washdown and sweeping of liquids, and will be transported and disposed off-site at the MWRD's Calumet WWTP HSOM discharge location at a unit cost of $0.13/gallon for vacuum truck plus transport and disposal.

- It is assumed that the additional response and cleanup activities will involve the use of an emergency response contractor who will provide a crew of three for a total of 5-days (24-hrs/day), including allowances for job trucks, one bobcat, two 3,000-gallon vacuum trucks and operators, light towers for night work, and a 2-inch trash pump, at a combined cost of $27,000/day. (A spreadsheet summary in support of this calculation is provided in Attachment 13.

- It is assumed that two (2) frac tanks will be staged and used to temporarily store recovered liquids (with a delivery and pickup charge of $1,000.00/tank and rental charge of $31/day/tank).

- An allowance for heavy equipment and operator (CAT 330 Excavator) is included to clear debris and materials to allow the emergency response work to proceed, to perform any trenching or excavation work to support the liquids recovery, and to load any solid waste into trucks if off-site disposal of any solid waste materials is necessary ($1,200 mobilization plus $2,300/day x 5-days).

- A line item of $20,000 for general solid waste (non-hazardous) disposal to address some moderate quantities of solid waste materials that might need to be disposed off-site. At an assumed unit cost for transportation and disposal of $62/ton, this allowance equates to approximately 320-tons (16-loads @ 20-tons/load).

- Consultant oversight and documentation ($1,500/day x 5-days for on-site oversight + $5,000 in senior project management oversight, supervision, and reporting).

Item	Cost
Vac Truck Recovery, Transport, and Discharge to MWRD (@$0.13/gallon)	$1,800
Emergency Response Contractor (3-days + 2-days for setup/demobilization)	$135,000
Frac Tanks (3-days rental + 2-days setup/demobilization)	$2,500
Heavy Equipment Rental and Operator	$12,700
Solid Waste Disposal	$20,000
Consultant Oversight and Reporting	$12,500
Total Estimated Costs	**$184,500**

Total Combined Catastrophic Spill Recovery and Cleanup Cost Estimate
The total combined costs for catastrophic spill recovery and cleanup is estimated at $88,586 + $184,500 = **$273,086**

12. [The following is a restatement of what was provided in the September 21, 2022 Partial Response]. *CDPH requires certain information to assess potential noise impacts to surrounding residences. Pursuant to 11-4-1520(A)(30) of the Code, provide the following information for each and every outdoor mechanical equipment/device, including but not limited to air pollution control devices, blowers, fans, pumps, motors, and generators:*
    i. brief description, make and model number;
    ii. physical dimensions in meters,
    iii. sound power and octave band, or sound pressure reading and measurement distance,
    iv. location in UTM coordinates, and
    v. installation height in meters.

Response: The equipment to be in operation at the facility outside of the building (i.e., the primary noise concerns) includes the following:

- Two (2) air handlers (Model DGX-P227-H38-II) each with a variable speed blower (18,000-CFM to 30,000-CFM) for building makeup air (i.e., fresh air draw-in) and manufactured by Greenheck Fan Corporation (sound power by octave band is noted below);

Sound Power by Octave Band								Lwa	dBA
62.5	125	250	500	1000	2000	4000	8000		
91	94	100	104	100	94	88	84	105	94

- The pressure swing adsorption system (consisting of multiple pieces of equipment on three [3] skids) to be operated as the biogas upgrading equipment and manufactured by Guild Associated, Inc. (sound pressure readings for the combined system are included in Attachment 14);
- One (1) natural gas-fired flare (Model FAII 1500hp) for use in burning non-upgraded biogas or biomethane not injected into the natural gas utility system and manufactured by Bilgeri EnvironTec GmbH (no sound power information; not a source of mechanical noise);

- One (1) natural gas-fired thermal oxidizer (Quadrant NR 2.0) for use in burning tail gas (by-product of upgraded biogas) and manufactured by Catalytic Products International (no sound power information; not a source of mechanical noise);
- The odor control system with a total of four (4) exhaust blowers as follows:
    - Two (2) exhaust fans (Model VAB-36F14-II-300 and VAB-36F14-II-500) with a variable speed blower (19,000-CFM to 26,400-CFM and 19,000-CFM to 33,600-CFM) as building outlet/odor control system inlet and manufactured by Greenheck Fan Corporation (sound power by octave band is noted below)

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA
Inlet	93	98	105	101	101	99	94	87	106	95

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA
Inlet	100	105	112	110	109	107	103	96	114	102

    - Two (2) exhaust fans (Model A03-1-303BC100STFCU3) each with a 21,000-CFM blower drawing air through the odor control system to the emissions stack outlet manufactured by Hartzwell Air Movement (located inside of the odor control system structure, not outdoors)

The below table summarizes the additional information requested by CDPH for this equipment.

Equipment	UTM	Dimensions (m)	Height (m)	Sound Information
Air handler (north)	446720.90 E 4621573.38 N	Base: 3.76 x 2.34 (148-in x 92-in)	1.22 (48-in)	62.5: 91 125: 94 250: 100 500: 104 100: 100 2000:94 4000: 88 8000: 84
Air handler (south)	446730.30 E 4621610.71 N	Base: 3.76 x 2.34 (148-in x 92-i)	1.22 (48-in)	Same as above
Pressure swing adsorption (PSA) system (see note below)	446755.09 E 4621642.52 N	Approximately Base: 19.66 x 2.87 (64.5-ft x 9-ft, 5-in)	4.32 (14-ft, 2-in)	See manufacturer's data in Attachment 14
Flare	446750.59 E 4621629.67 N	Base: 1.17 x 1.17 (46-in x 46-in) Stack Diameter: 1.43 (56.3-in)	7.47 (24.5-ft)	No sound power information; not a source of mechanical noise
Thermal oxidizer	446745.28 E 4621630.6 N	Base: 3.49 x 5.49 (10-ft x 18-ft) Stack Diameter: 0.50 (19.75-in)	3.94 (12.92-ft)	No sound power information; not a source of mechanical noise

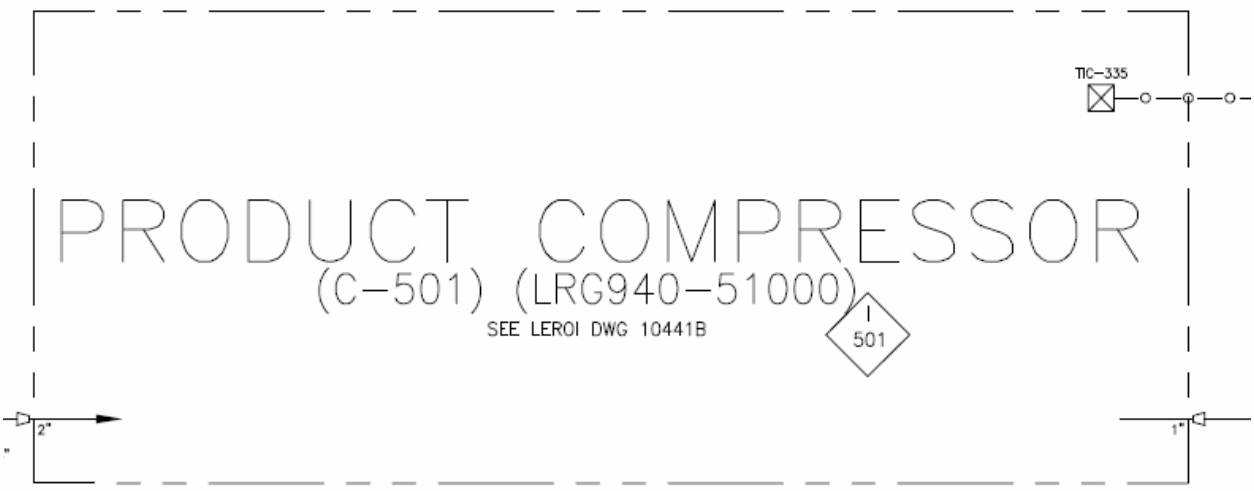
Equipment	UTM	Dimensions (m)	Height (m)	Sound Information
Odor control system	446667.82 E 4620498.11 N (emission stack coordinates)	3 Modified shipping containers: 12.19 x 2.44-ft (40-ft x 8-ft)	Container: 2.9 (9.5-ft) Top of affixed blowers: 2.67 (15-ft, 7-in)	62.5: 93 and 100 125: 98 and 105 250: 105 and 112 500: 101 and 110 100: 101 and 109 2000:99 and 107 4000: 94 and 103 8000: 87 and 96

Note: Numerous pieces of equipment make up the PSA system, but only the compressors are noise-generating. Specifications for the noise-producing compressors are provided below. For completeness, the other PSA equipment are also included, although not considered noise-generating.

Noise-generating compressors (C101, C451, and C501)

C101
COMPRESSOR
MAKE: LeROI
MODEL: HG17243VIP
HP: 150

C451
VACUUM COMPR
FLOW: 123 SCFM NOM
PRESSURE: 2 PSIA IN, 18 PSIA OUT
WT (COMPR): 450 LBS
WT (MOTOR): 630 LBS
MOTOR: 75 HP



Non-noise-generating equipment

V100
INLET KNOCK-OUT

CAPACITY: 60 GALLONS
SIZE: 16" O.D X 112"H
FLANGES: 4"150# IN & OUT
MAWP: 150PSI @ -20 to 230'F

V130
GAS/OIL SEPARATOR

CAPACITY: 110 GALLONS
SIZE: 24" O.D X 77"H
CONNECTIONS: 2"150# IN & 2" FNPT OUT
MAWP: 150 PSI @ -20 to 230'F

HX132
GAS/OIL COOLER

MAKE: KIM KOOL INC.
MODEL: A71-1158
DUTY: 466,560 BTU/HR
SIZE: 66.5" X 55" X 10.5"
HP: 10
MAWP (GAS): 150 PSIG @ -20 TO 230'F
MAWP (OIL): 350 PSIG @ -20 TO 230'F
FINISH: ELECTRO-NICKEL

V140
OUTLET KNOCK-OUT

CAPACITY: 25 GALLONS
SIZE: 8" O.D X 117"H
FLANGES: 2"150# IN & OUT
MAWP: 150PSI @ -20 to 230'F

HX150
OUTLET GAS HEATER

DUTY: 94,000 BTU/HR
SIZE: 12"X 13" X 39"
FLANGES: 3" COMPACT FLANGES
MAWP (GAS): 300 PSIG @ -155'-300'F
MAWP (OIL): 300 PSIG @ -155'-300'F

FIT301
FLOW CONTROLLER

FLOW: 400 SCFM NOMINAL
PRESSURE: 100 PSIG NOMINAL
SIZE: 14"W X 42"L X 22"H
WT: 150 LBS
FLANGES: 3"150# IN & OUT

V301
INLET KNOCK-OUT

CAPACITY: 25 GALLONS
SIZE: 12.75" O.D X 55"H
WT: 400 LBS
FLANGES: 2"150# IN & OUT
MAWP: 150PSI @ -20 to 230'F

V31, V32, V33
ADSORBER VESSELS

MAWP: 200PSI @ -20 TO 230'F
CAPACITY: 250 GALS
ADSORBER SIZE: 3 @ 36.75"O.D. X 99.38"H/EA
ADSORBER WT: 3 @ 2100 LBS/EA EMPTY

V304
PURGE VESSEL

MAWP: 200PSI @ -20 TO 230'F MAWP
CAPACITY: 240 GALS
SIZE: 30"OD X 93"H
WEIGHT: 525 LBS

V303A&B&C, V308A&B
EQUALIZATION/REPRESSURIZATION VESSELS

MAWP: 200PSI @ -20 TO 230'F
CAPACITY: 1000 GALS
SIZE: 42"OD X 170"L
WEIGHT: 2000 LBS

V455
GAS/OIL SEP

MAWP: 100 PSIG @ -20 TO 230'F
CAPACITY: 122 GALS
SIZE: 22"OD X 86"H
WEIGHT: 600 LBS

HX452
PSA GAS HEATER

DUTY: 65,400 BTU/H
SIZE: 42"L X 30"W X 24"H
WT: 580 LBS
FLANGES: GAS 3"150#, OIL 1"NPT
MAWP: 150 PSIG, -20 to 350'F

HX453
OIL COOLER

MAWP: 250 PSIG, -20 TO 250'F
CAPACITY: 2.3 GALS
SIZE: 23"D X 37"W X 30"H
WEIGHT: 240 LBS
MOTOR: 3/4 HP

FCV460
FLOW METER

FLOW: 170 SCFM NOMINAL
PRESSURE: 2 PSIG NOMINAL
FLANGES: 2"150# IN & OUT

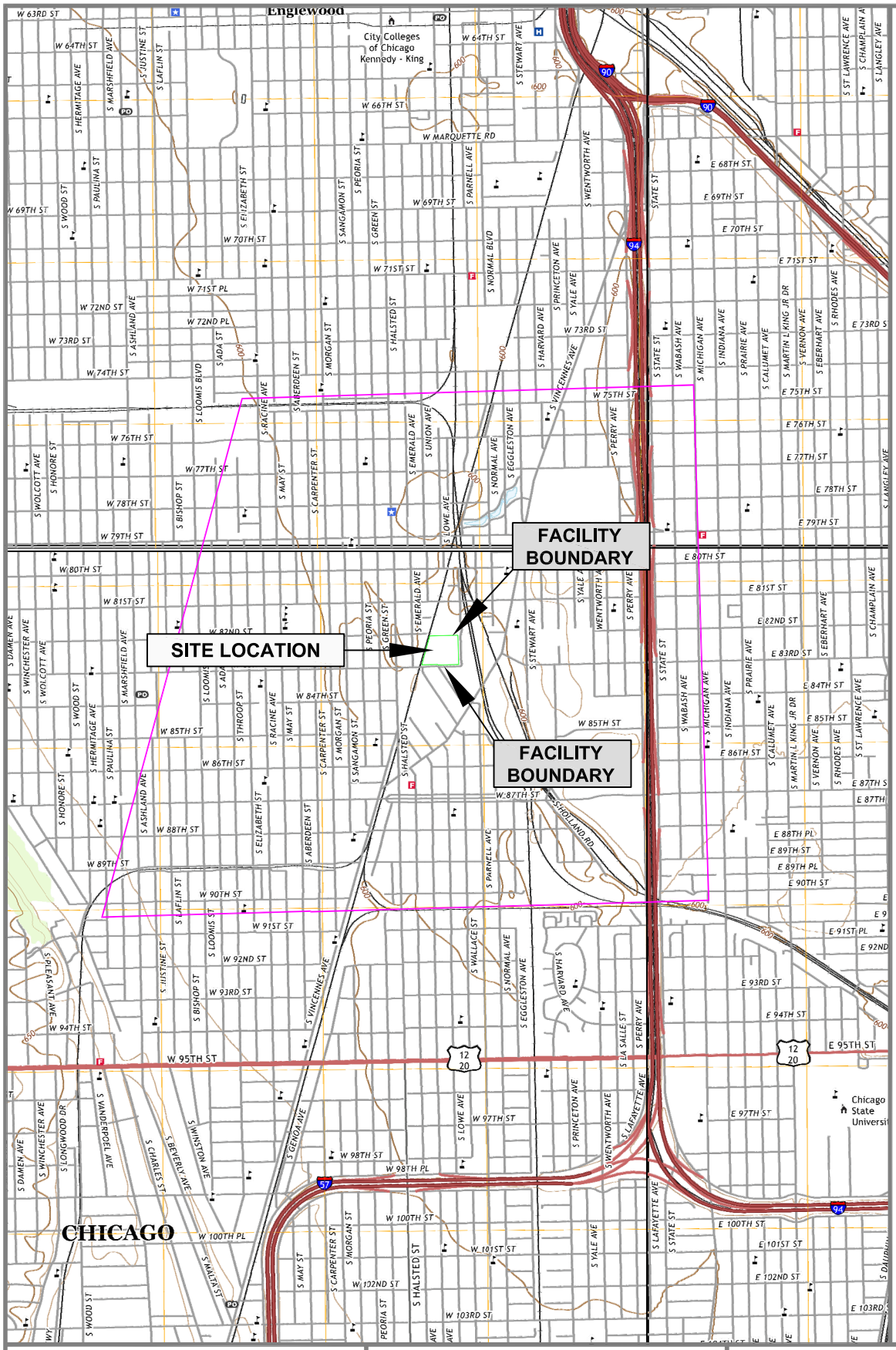
V462A/B
TAILGAS TANKS

MAWP: 100PSI @ -20 TO 230'F MAWP
CAPACITY: 1000 GALS
SIZE: 42"OD NOM. X 170"H
WEIGHT: 2000 LBS

DRY704
PSA DRYER

FLOW: 25 SCFM
PRESSURE: 100 PSIG
SIZE: 22"L X 14"W X 52"H
WT: 265 LBS

ATTACHMENT 2
FIGURES



LEGEND

APPROXIMATE SITE PROPERTY BOUNDARY

1-MILE OFFSET FROM FACILITY BOUNDARY

BLUE ISLAND & ENGLEWOOD QUADRANGLES ILLINOIS-COOK CO.

AND

JACKSON PARK & AND LAKE CALUMET QUADRANGLES ILLINOIS-INDIANA 7.5-MINUTE SERIES (2021 TOPOGRAPHIC)

N

0' 3,000'

S C A L E

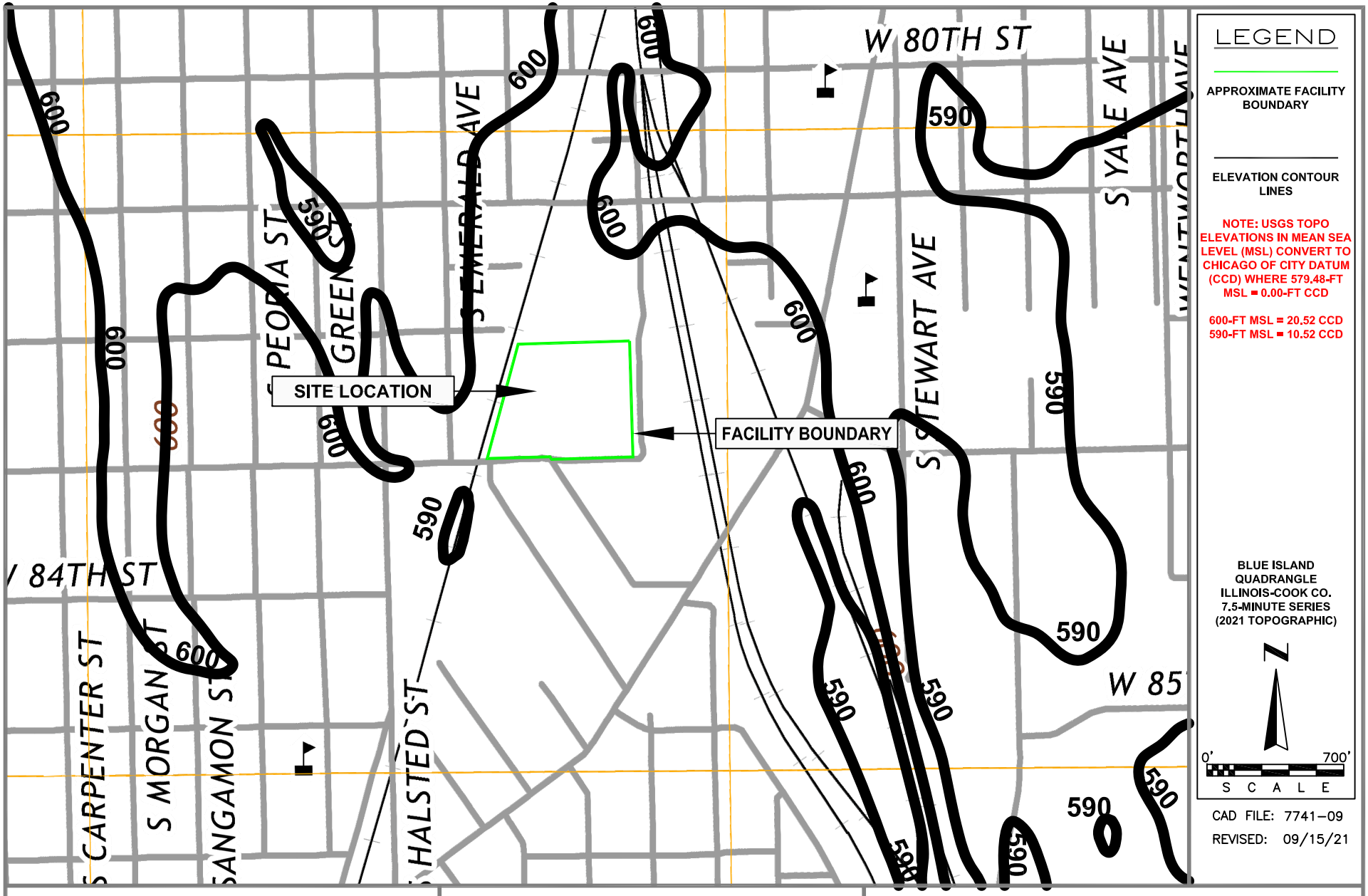
CAD FILE: 7741-01B(LW)

REVISED: 10/28/21

PAL ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

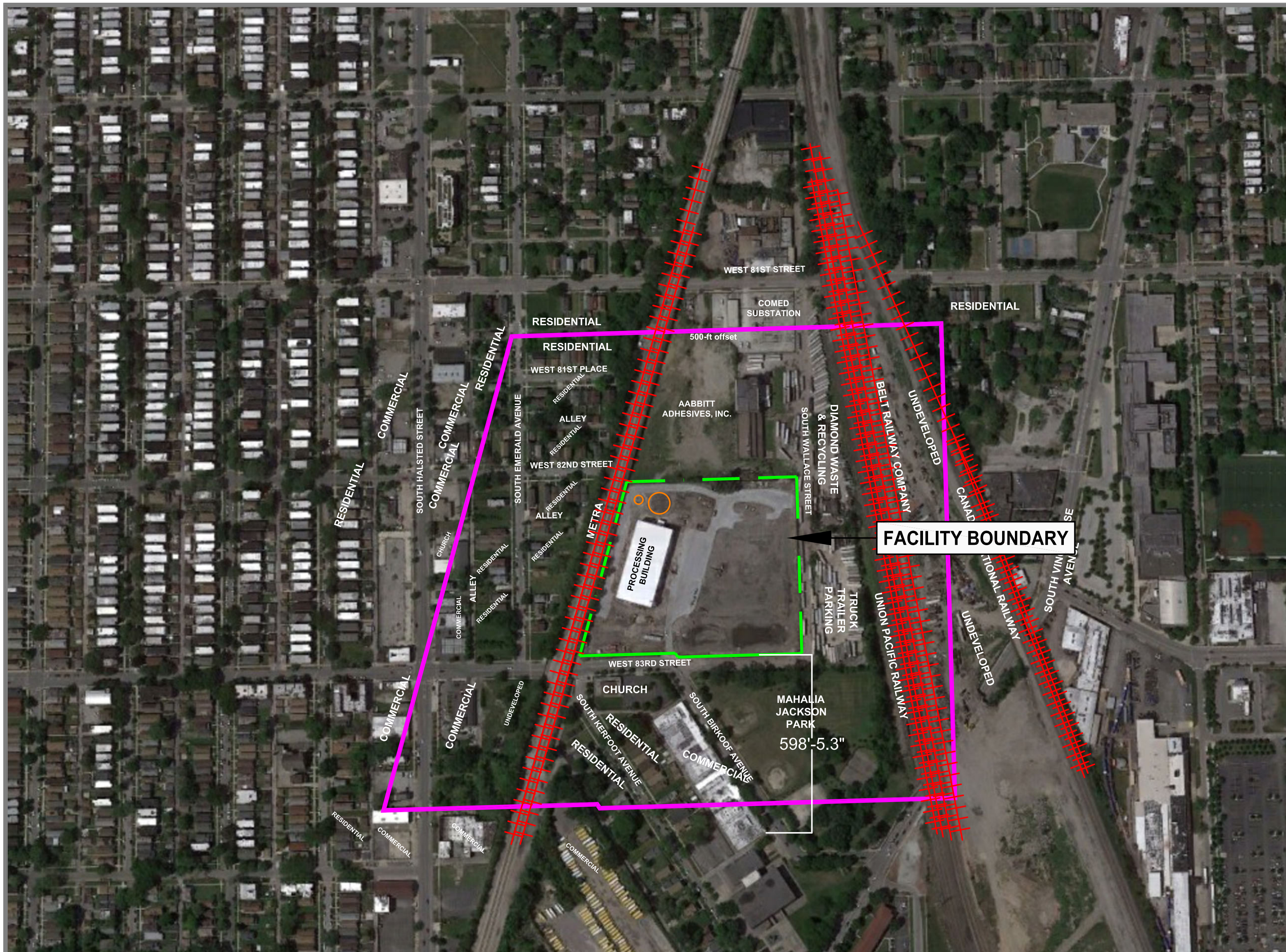
FIGURE 1
SITE LOCATION MAP



ENVIRONMENTAL PAI

GREEN ERA RENEWABLE ENERGY
AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 1A
TOPOGRAPHIC DETAIL OF FACILITY
AND SURROUNDING AREA



LEGEND

PROPERTY BOUNDARY OF COMPOSTING FACILITY

500-FT OFFSET FROM FACILITY BOUNDARY

ABOVEGROUND STORAGE TANK

THE NEAREST WATER WELL IS LOCATED OVER 2,000-FT FROM THE FACILITY AND IS NOT LIKELY IN USE PER CITY OF CHICAGO RESTRICTIONS.

THE FACILITY IS NOT LOCATED WITHIN OR NEAR THE 10-YEAR FLOOS PLAIN. MAPPING INDICATES "AREA OF MINIMAL FLOOD HAZARD."

N

0' 300'

S C A L E

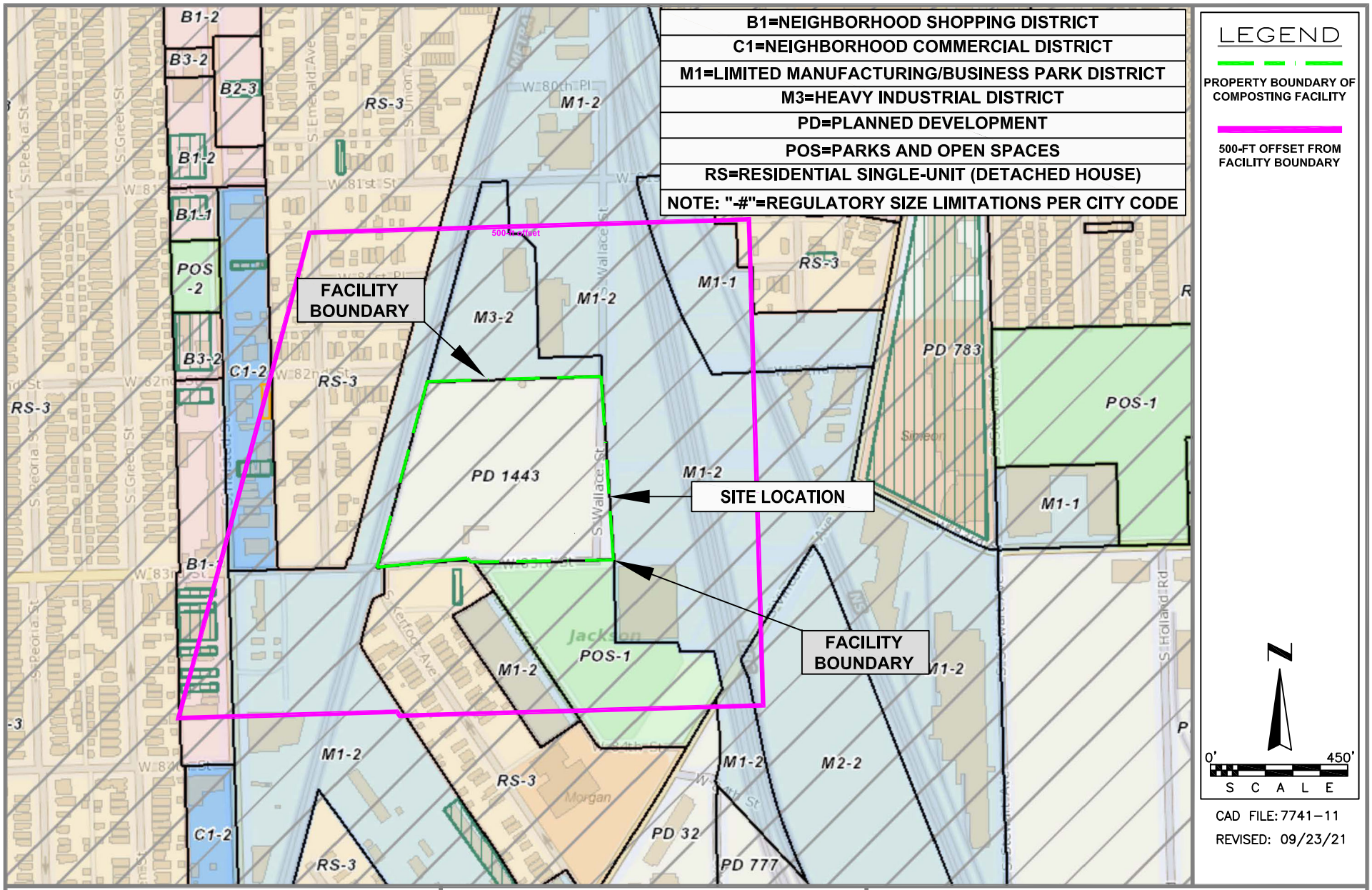
CAD FILE: 7741-14A

REVISED: 10/28/21

DAI ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

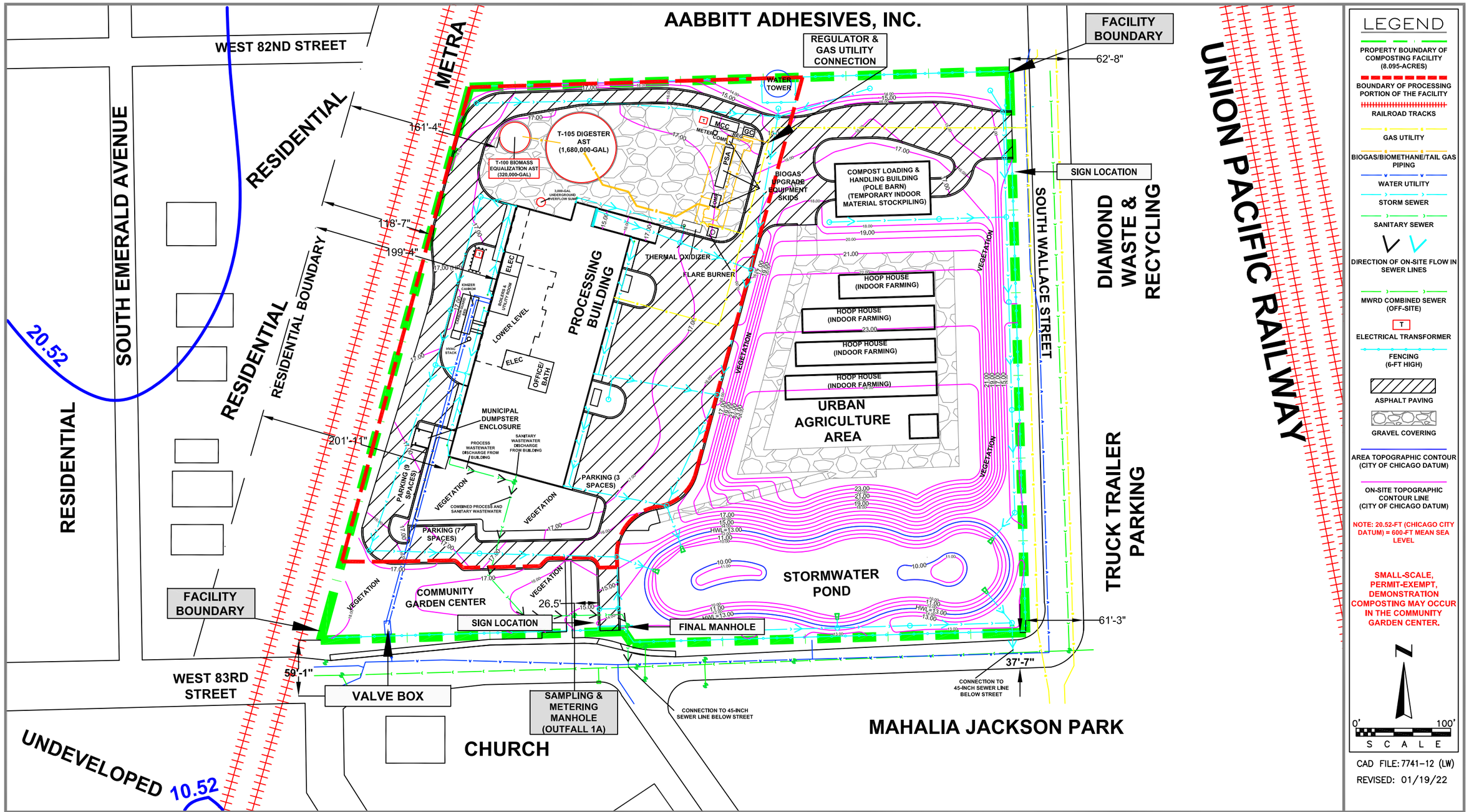
FIGURE 2
AERIAL VIEW OF SITE AND SURROUNDING PROPERTY USAGE
(MAY 2021 AERIAL TAKEN GOOGLE EARTH)



DAI ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY
AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

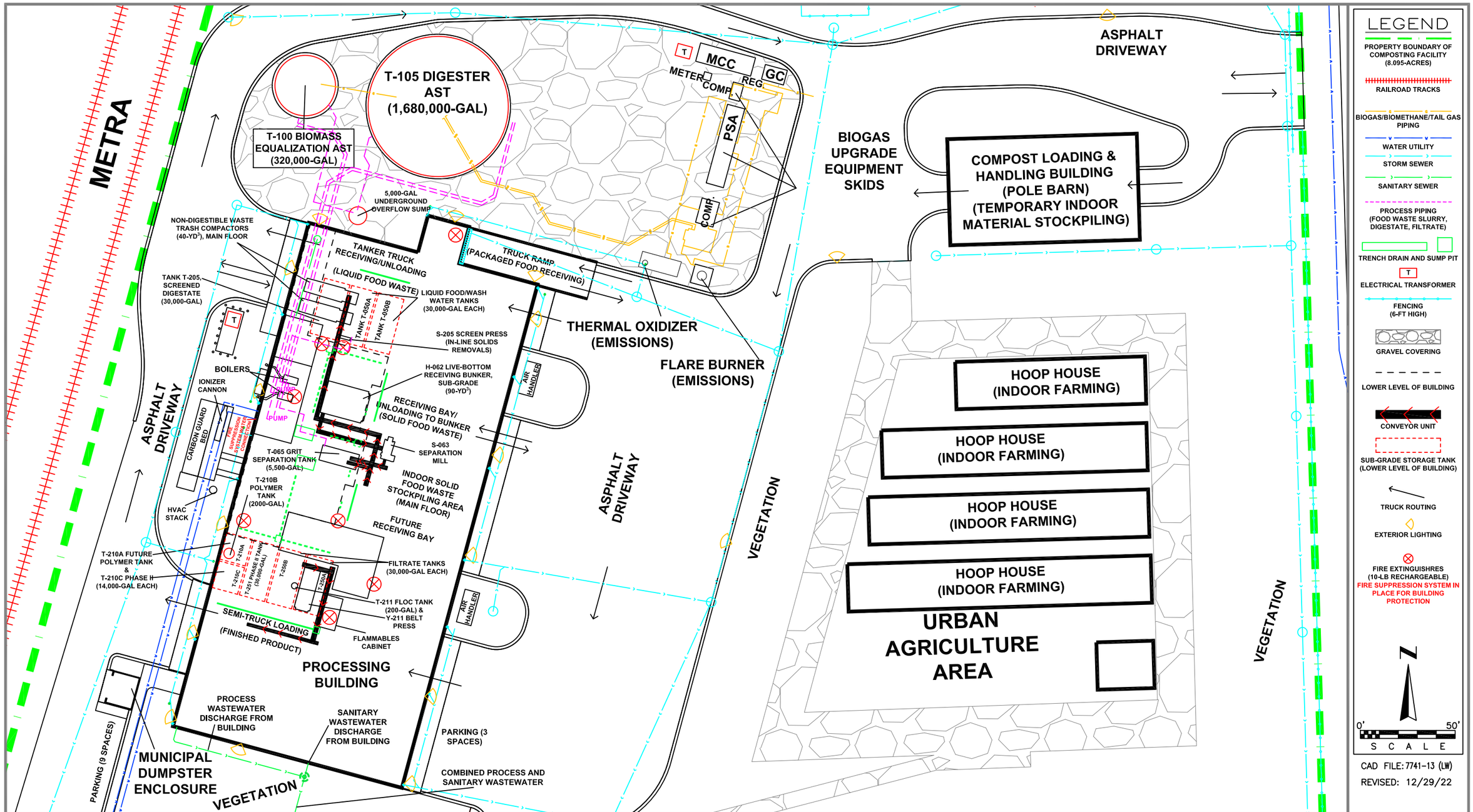
FIGURE 2A
SITE AND SURROUNDING
AREA ZONING MAP



DAI ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY
AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

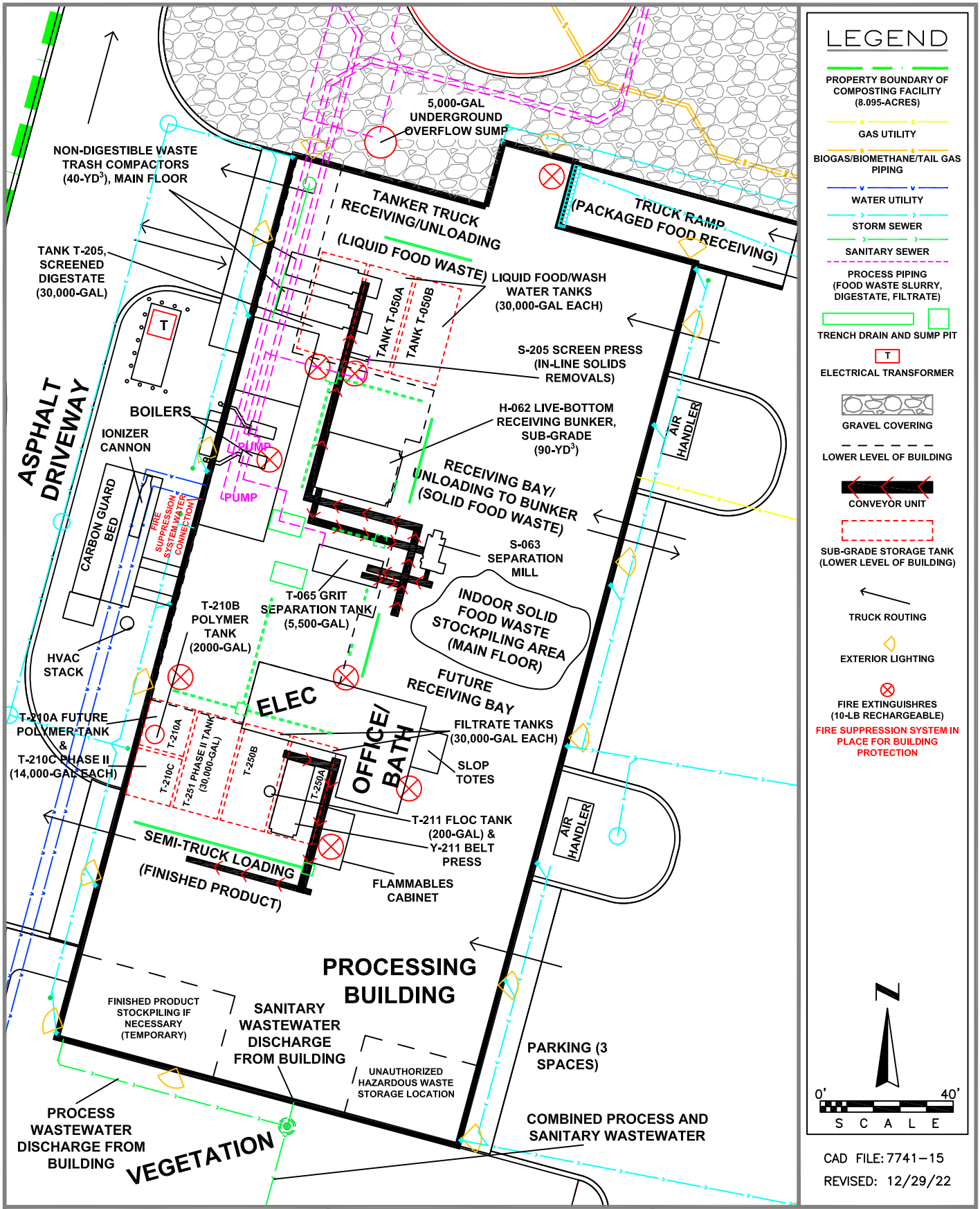
FIGURE 3
SITE PLAN AND CONTOUR MAP



DAI ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 3A
SITE DETAIL SHOWING
PROCESS OPERATIONS AND EQUIPMENT

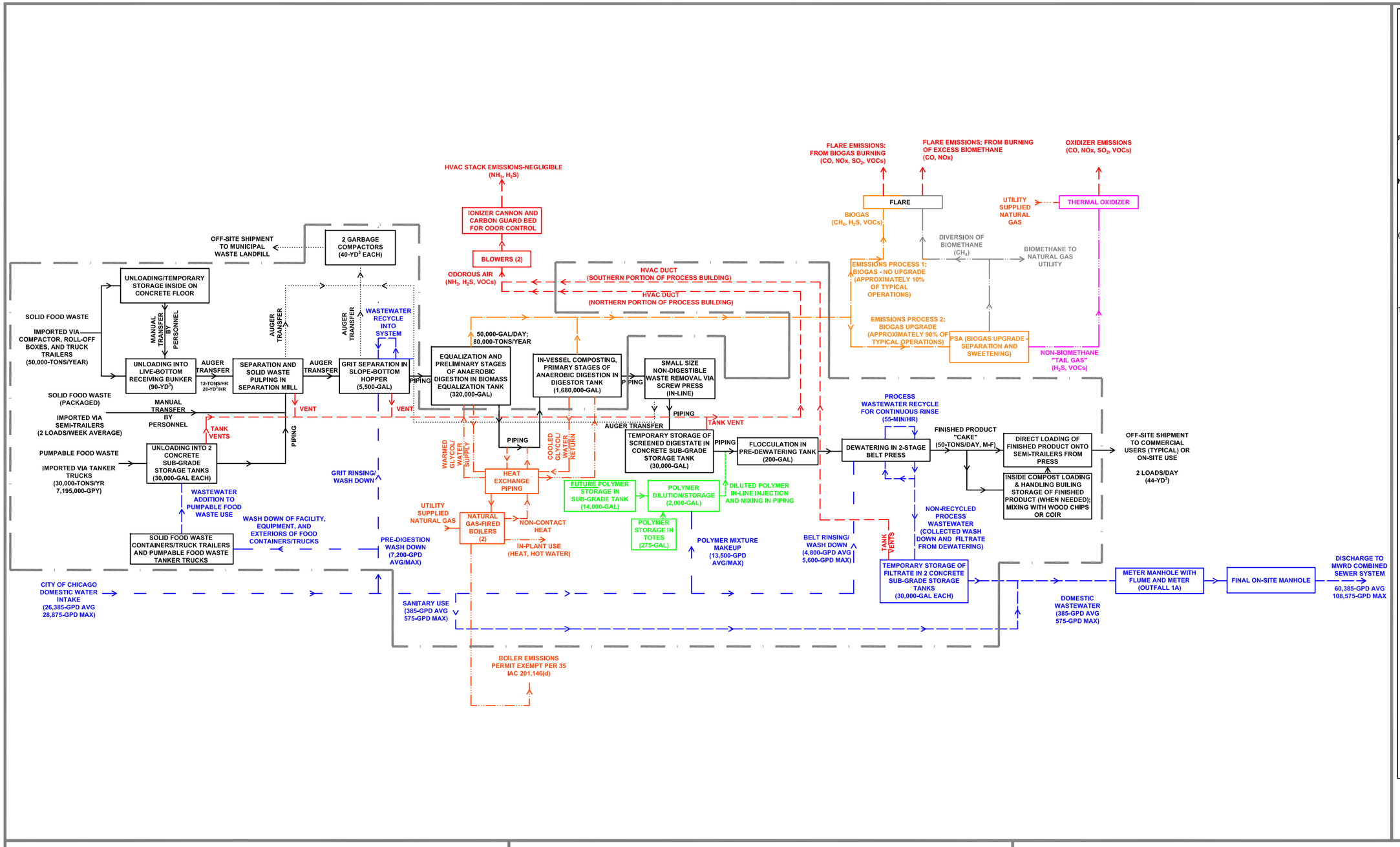


CAD FILE: 7741–15
REVISED: 12/29/22

ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 3B
PROCESS BUILDING DETAIL



LEGEND

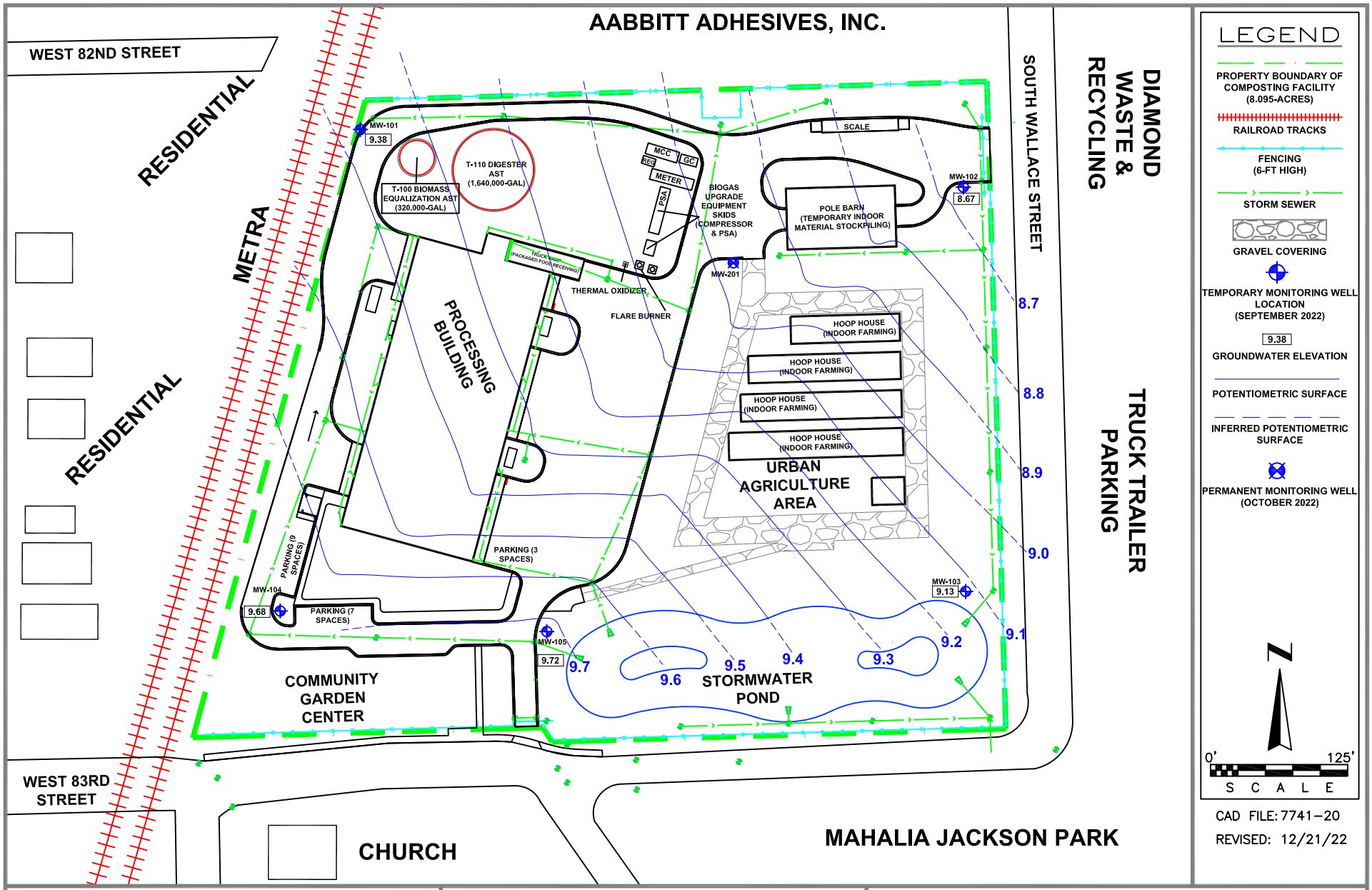
- FOOD WASTE ANAEROBIC DIGESTION PROCESS
- NON-DIGESTIBLE WASTE REMOVAL/OFF-SITE SHIPMENT
- IN-LINE INJECTION OF DILUTED POLYMER INTO PIPING PRIOR TO DEWATERING PROCESS (AIDS IN FLOCCULATION)
- NATURAL GAS USE/EMISSIONS & HEAT EXCHANGE OPERATIONS
- BIOGAS PRODUCTION WITH TRANSFER TO UPGRADE (TYPICAL) OR FLARE (EMERGENCY) AND ASSOCIATED EMISSIONS
- BIOMETHANE (UPGRADED BIOGAS) WITH TRANSFER TO UTILITY OR EMISSIONS VIA FLARE
- TAIL GAS (WASTE FROM BIOGAS UPGRADE) EMISSIONS VIA THERMAL OXIDIZER
- EMMISSIONS TO ATMOSPHERE
- DOMESTIC WATER USE
- WASTEWATER REUSE/DISCHARGE
- PORTIONS OF PROCESS PERFORMED INSIDE OF PROCESSING BUILDING (INDOORS)

CAD FILE: 7741-04B
REVISED: 12/13/21

DAI ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 4
PROCESS FLOW DIAGRAM AND WATER USAGE/WASTEWATER DISCHARGE SCHEMATIC



ENVIRONMENTAL DAI

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 5
POTENTIOMETRIC SURFACE MAP
(SEPTEMBER 30, 2022)

LEGEND

PROPERTY BOUNDARY OF COMPOSTING FACILITY

SOIL BORING/MONITORING WELL LOCATION

ISGS WATER WELL LOCATION

A — A'

STRATIGRAPHIC CROSS-SECTION (SEE FIGURES 6A & 6B)

N

0' 650'

S C A L E

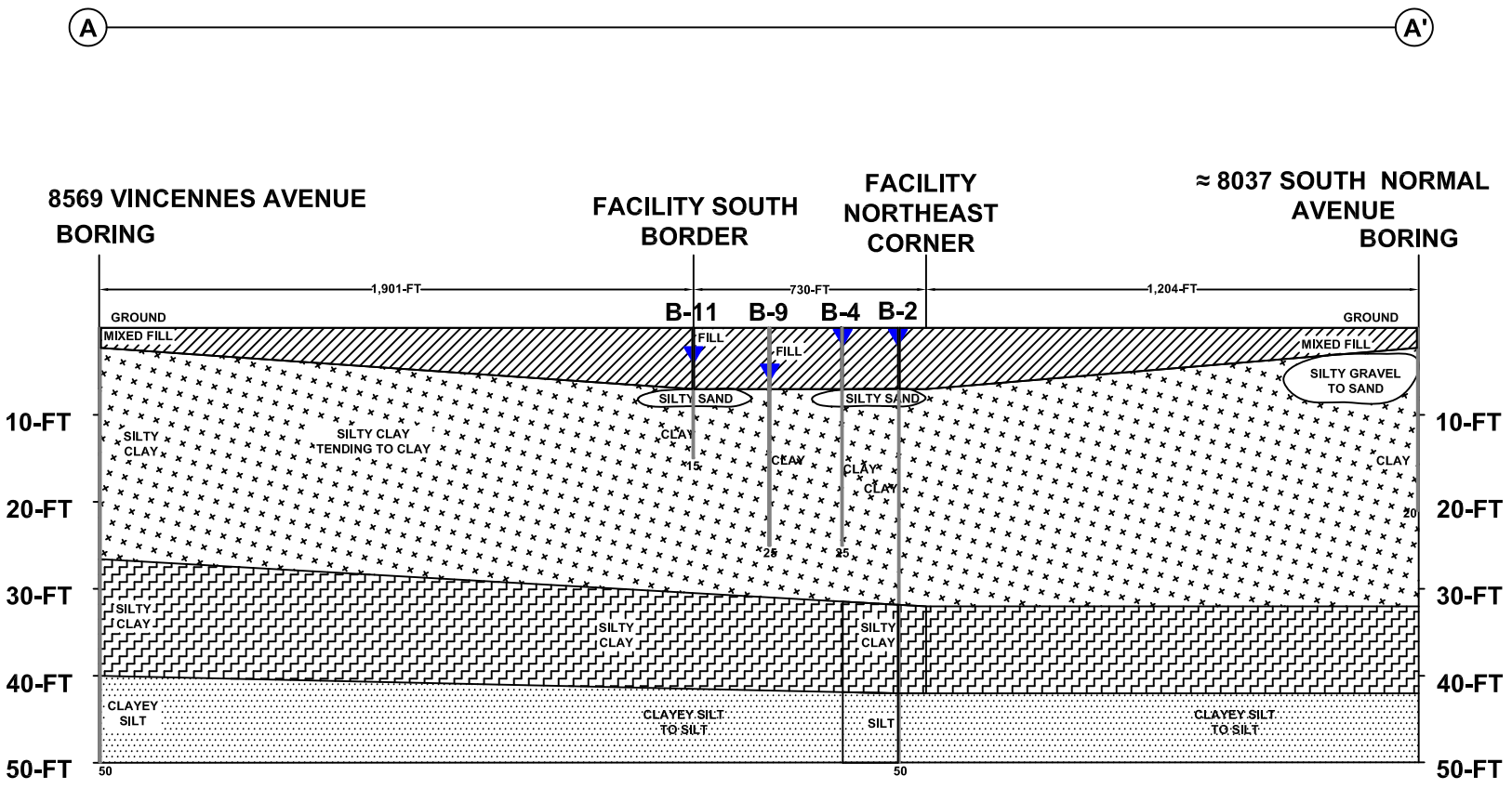
CAD FILE: 7741–23

REVISED: 12/29/22

DAI ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 6
CROSS-SECTION OVERVIEW
(2022 AERIAL TAKEN FROM GOOGLE EARTH)



LEGEND

- OBSERVED GROUNDWATER DEPTH IN WELL (MOST RECENT MEASUREMENT)
- MIXED FILL
- SILTY CLAY TO CLAY
- SILTY CLAY
- CLAYEY SILT

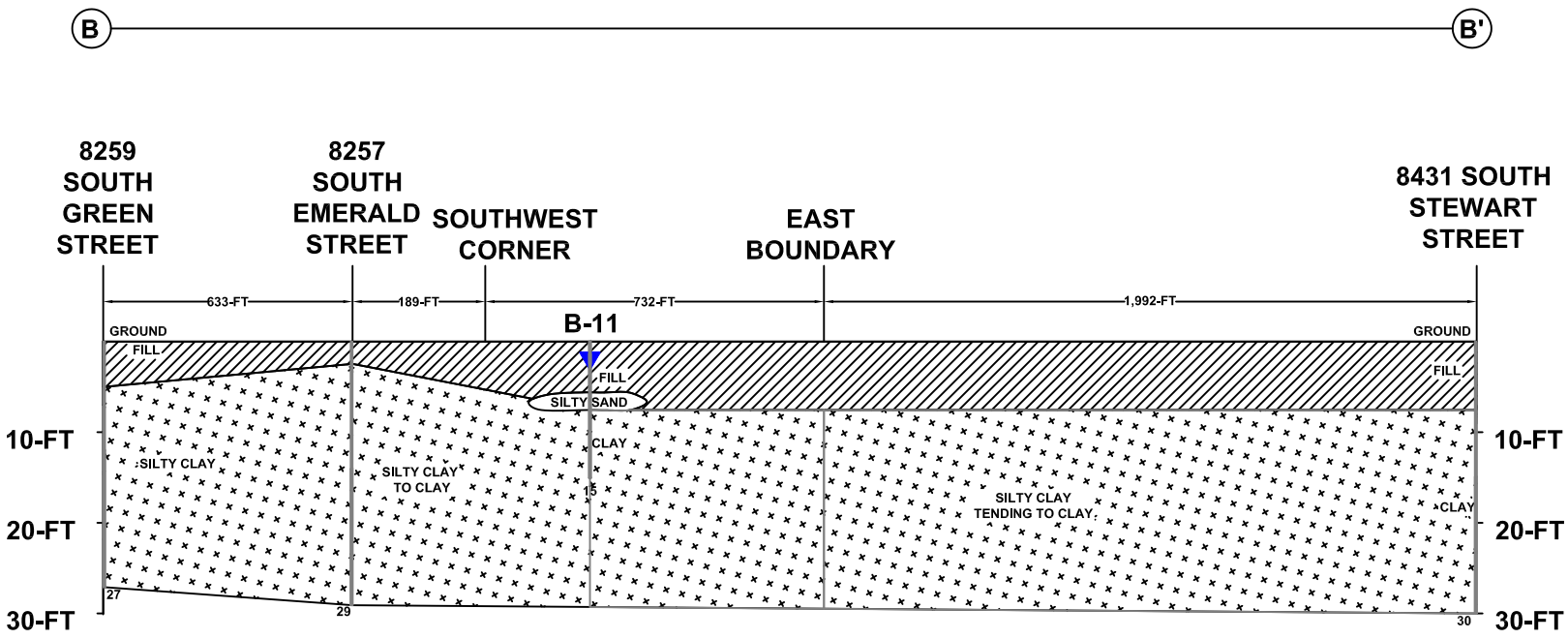
CAD FILE: 7741–21

REVISED: 12/29/22

ENVIRONMENTAL DAI

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 6A
STRATIGRAPHIC CROSS-SECTION
(A-A')



LEGEND

OBSERVED GROUNDWATER DEPTH IN WELL (MOST RECENT MEASUREMENT)

MIXED FILL

SILTY CLAY TO CLAY

CAD FILE: 7741–22

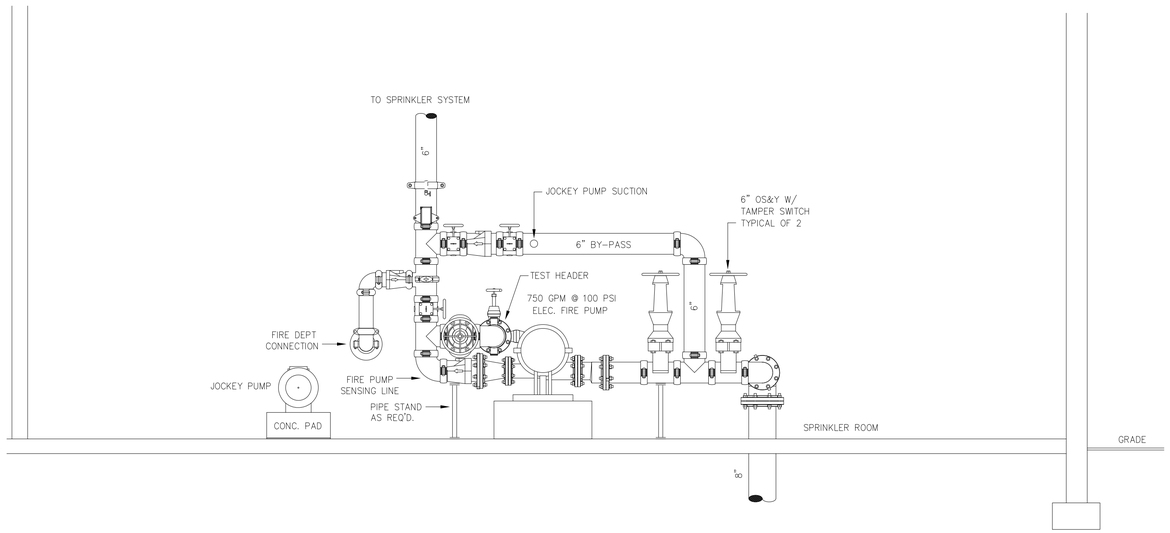
REVISED: 12/29/22

ENVIRONMENTAL DAI

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 6B
STRATIGRAPHIC CROSS-SECTION
(B-B')

ATTACHMENT 3
FIRE SYSTEM SCHEMATIC DRAWINGS



SPRINKLER ROOM – FIRE PUMP DETAIL

SCOPE OF WORK:

DESIGN AND INSTALL A WET PIPE SPRINKLER SYSTEM TO PROTECT THE ENTIRE BUILDING.
INSTALL A 750 GPM @100 PSI FIRE PUMP.

DESIGN:

AREA 1: OFFICE
OCCUPANCY CLASSIFICATION IS LIGHT HAZARD.
DESIGN DENSITY IS .12 GPM OVER 1500 SQ. FT.
MAXIMUM SPACING PER SPRINKLER IS 225 SQ FT.

AREA 2: TRUCK UNLOADING - STORAGE - PROCESSING
OCCUPANCY CLASSIFICATION IS G-2.
STORAGE HEIGHT LESS THAN 12'.
DESIGN DENSITY IS .25 GPM OVER 2500 SQ. FT.
MAXIMUM SPACING PER SPRINKLER IS 130 SQ FT.

AREA 3: CHEMICAL STORAGE
OCCUPANCY CLASSIFICATION IS G-2.
DESIGN DENSITY IS .25 GPM OVER 2500 SQ. FT.
MAXIMUM SPACING PER SPRINKLER IS 130 SQ FT.

BUILDING CONSTRUCTION:

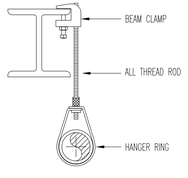
NON-COMBUSTIBLE
STEEL BEAM PURLIN
METAL ROOF
CONCRETE FLOORS
METAL SIDING

MATERIAL NOTES:

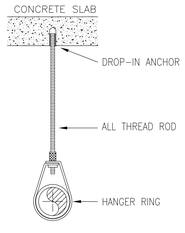
SPRINKLER MAINS AND LINES ARE BLACK SCHEDULE 10 WITH GROOVED ENDS AND FITTINGS.
SPRINKLER ARM OVER PIPES ARE BLACK SCHEDULE 40 WITH THREADED ENDS AND FITTINGS.
PIPE HANGERS SHALL BE INSTALLED AS REQUIRED BY NFPA FOR SUPPORTING SPRINKLER PIPING.
NO OTHER TRADES SHALL CONTACT ANY PART OF THE SPRINKLER SYSTEM.
NO OTHER PIPING AND/OR DEVICES ARE TO BE ATTACHED TO THE SPRINKLER PIPE HANGER SYSTEM.
THIS CONTRACT DOES NOT INCLUDE ANY MATERIAL OR DEVICE TO IMPROVE THE STRUCTURAL STRENGTH OF THE BUILDING TO ENABLE IT TO CARRY THE LOAD OF THE FIRE PROTECTION SYSTEM.
ALL MATERIAL IS UL LISTED AND/OR FM APPROVED.

GENERAL NOTES:

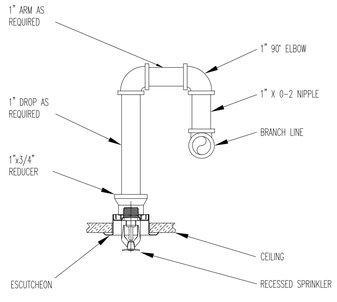
BEFORE ANY PIPES OR HANGERS ARE CONCEALED, THE FIRE DEPARTMENT SHALL BE NOTIFIED FOR INSPECTION PRIOR TO OCCUPANCY.
ADDITIONAL SPRINKLERS AND/OR DEVICES MAY BE REQUIRED OR DELETED UPON FIELD VERIFICATION.
BACKFLOW PREVENTER ASSEMBLY IS SUPPLIED AND INSTALLED BY PLUMBER.
BEFORE CONNECTION TO THE BACKFLOW PREVENTER ASSEMBLY THE UNDERGROUND PIPING SHALL BE FLUSHED PER NFPA 24 BY A LICENSED PLUMBING CONTRACTOR AND PROVIDED WITH A COPY OF THE UNDERGROUND FLUSHING AND TESTING CERTIFICATE.
ALL PIPING TO BE HYDROSTATICALLY PRESSURE TESTED UPON COMPLETION AT 200 PSI FOR 2 HOURS AND WITNESSED BY THE FIRE DEPARTMENT.
DRY VALVE WILL BE TRIP TESTED UPON COMPLETION.
TAMPER SWITCHES WILL BE PROVIDED ON ALL CONTROL VALVES.
ALL ELECTRICAL WIRING IS BY OTHERS.
ALL METHODS OF DESIGN & INSTALLATION WILL BE IN STRICT COMPLIANCE WITH REGULATIONS AS OUTLINED CITY OF CHICAGO FIRE PREVENTION BUREAU NFPA 20 AND NFPA 13 .



HANGER DETAIL1



HANGER DETAIL2



ARM OVER DETAIL

DRAWING IS PRELIMINARY AND NOT FOR CONSTRUCTION, RECORDING PURPOSES, OR IMPLEMENTATION

Contractors & Engineers of Automatic Sprinklers
Illinois Fire Sprinkler Contracting License #0009 • Established 1974
CENTRAL STATES AUTOMATIC SPRINKLERS, INC.
13740 South California Ave. – Blue Island, Illinois 60406 (708)489-9400

LaSalle Associates Consulting, Inc.
605 Wildwood Ln, West Chicago, IL 60185
630-293-9022 www.lasalleassoc.com

REV	DATE	BY	DESCRIPTION
E			
D			
C			
B			
A	10/9/20	JAA	ISSUED FOR CONSTRUCTION

SCALE: AS SHOWN
DATE: 10-20-18
DRAWN: JAA
CHECKED: RFC
APPROVED: RAA

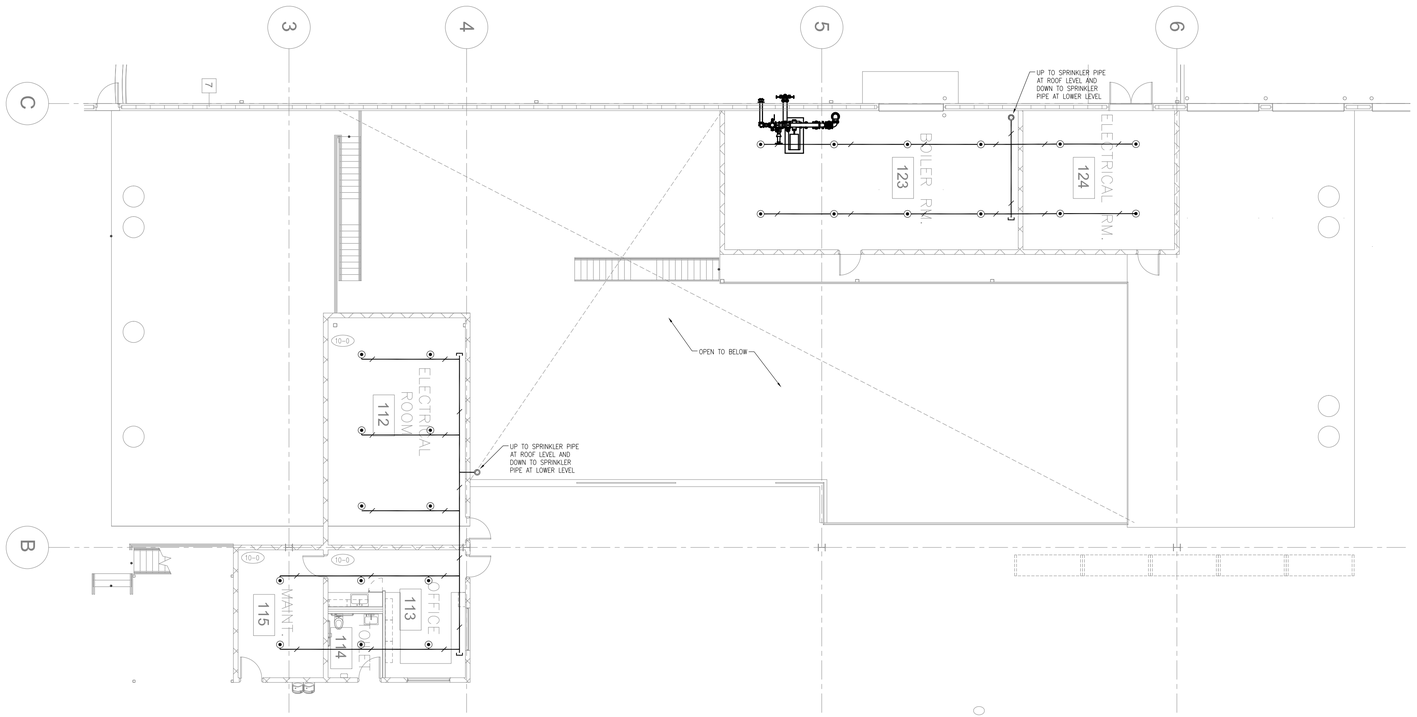
ACEng
www.ac-engineering.com

CLIENT
GREEN ERA SUSTAINABILITY, LLC
ANAEROBIC DIGESTER PROJECT
650 W. 83RD STREET
CHICAGO, IL. 60620

DESCRIPTION
FIRE PUMP PLAN
NOTES AND DETAILS

PROJECT NO:
1019.001

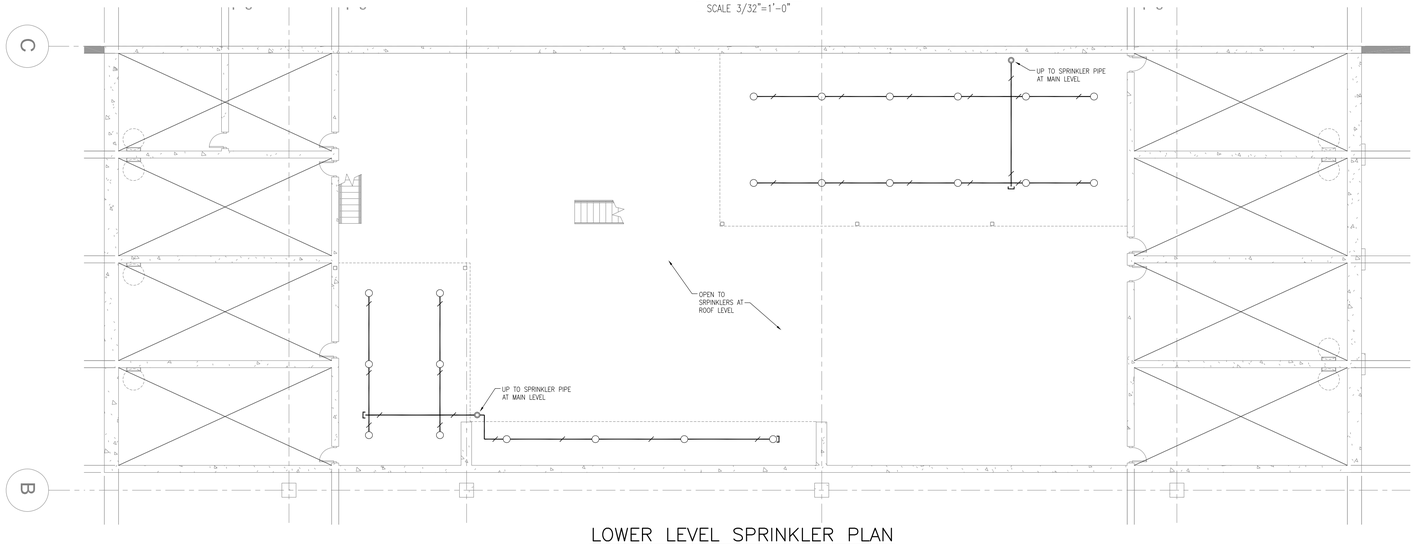
SHEET:
FP-100



MAIN LEVEL SPRINKLER PLAN

3 1½ 0 6 12

SCALE 3/32"=1'-0"



LOWER LEVEL SPRINKLER PLAN

3 1½ 0 6 12

SCALE 3/32"=1'-0"

N

DRAWING IS PRELIMINARY AND NOT FOR CONSTRUCTION, RECORDING PURPOSES, OR IMPLEMENTATION

Contractors & Engineers of Automatic Sprinklers

Illinois Fire Sprinkler Contracting License #0009 · Established 1974

CENTRAL STATES AUTOMATIC SPRINKLERS, INC.
13740 South California Ave. – Blue Island, Illinois 60406 (708)489-9400

LaSalle Associates Consulting, Inc.
605 Wildwood Ln, West Chicago, IL 60185
630-293-9022 www.lasalleassoc.com

REV	DATE	BY	DESCRIPTION
E			
D			
C			
B			
A	10/9/20	JAA	ISSUED FOR CONSTRUCTION

SCALE:	AS SHOWN
DATE:	10-20-18
DRAWN:	JFD
CHECKED:	RFC
APPROVED:	RAA

ACEng
www.ac-engineering.com

CLIENT

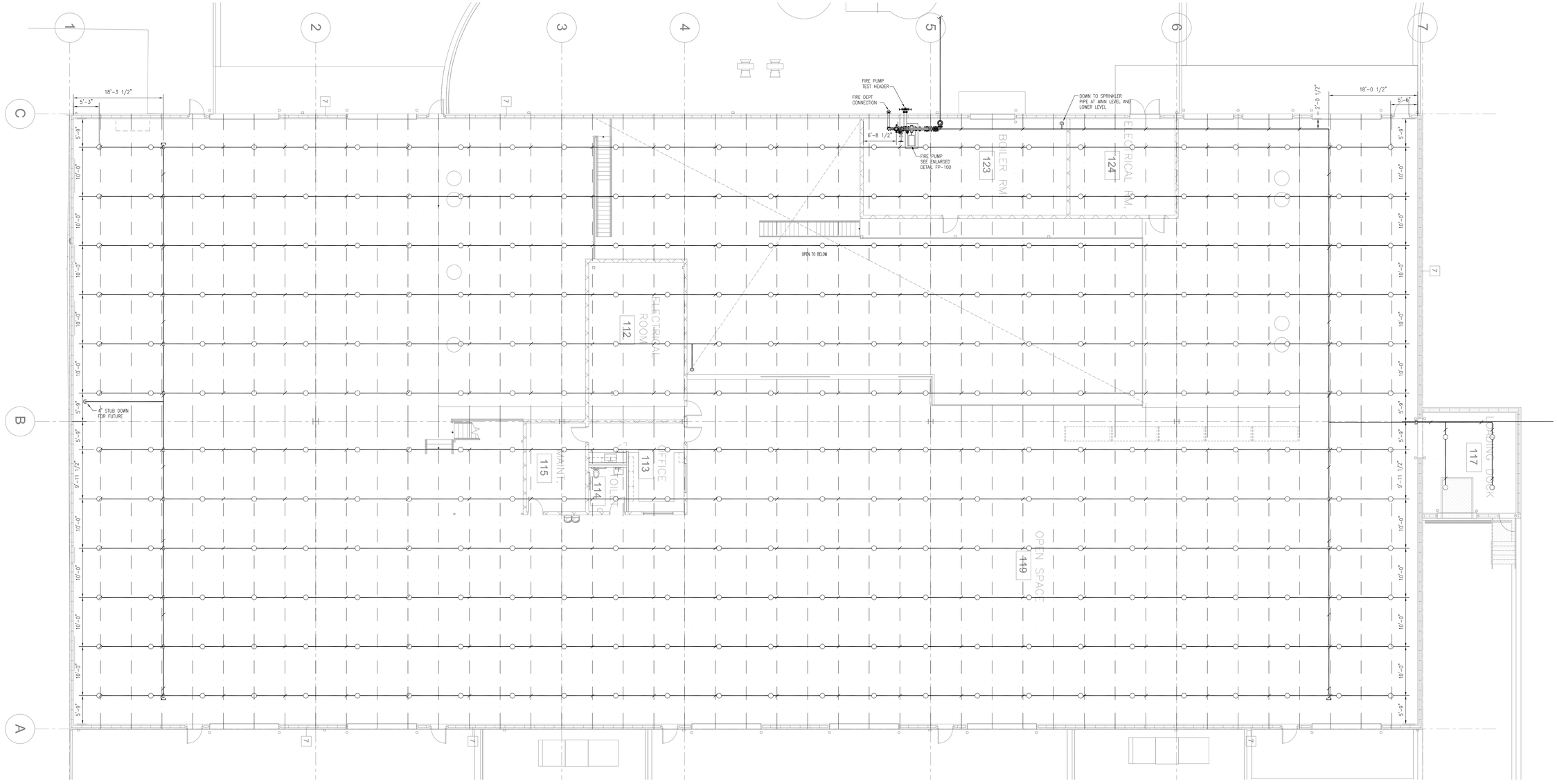
GREEN ERA SUSTAINABILITY, LLC
ANAEROBIC DIGESTER PROJECT
650 W. 83RD STREET
CHICAGO, IL. 60620

DESCRIPTION

OFFICE FIRE SPRINKLER PLAN
PHASE 2 FIRE SPRINKLER PLAN
LOWER LEVEL FIRE SPRINKLER PLAN

PROJECT NO:
1019.001

SHEET:
FP-101



ROOF LEVEL SPRINKLER PLAN

3 1½ 0 6 12

SCALE 3/32"=1'-0"

N

DRAWING IS PRELIMINARY AND NOT FOR CONSTRUCTION, RECORDING PURPOSES, OR IMPLEMENTATION

Contractors & Engineers of Automatic Sprinklers
Illinois Fire Sprinkler Contracting License #0009 Established 1974
CENTRAL STATES AUTOMATIC SPRINKLERS, INC.
13740 South California Ave. ~ Blue Island, Illinois 60406 (708)489-9400

LaSalle Associates Consulting, Inc.
605 Wildwood Ln, West Chicago, IL 60185
630-293-9022 www.lasalleassoc.com

REV	DATE	BY	DESCRIPTION
E			
D			
C			
B			
A	10/9/20	JAA	ISSUED FOR CONSTRUCTION

SCALE:	AS SHOWN
DATE:	10-20-18
DRAWN:	JFD
CHECKED:	RFC
APPROVED:	RAA

ACEng
www.ac-engineering.com

CLIENT

GREEN ERA SUSTAINABILITY, LLC
ANAEROBIC DIGESTER PROJECT
650 W. 83RD STREET
CHICAGO, IL. 60620

DESCRIPTION

MAIN LEVEL FIRE SPRINKLER PLAN

PROJECT NO:
1019.001

SHEET:
FP-102

ATTACHMENT 4
ELECTRICITY AND NATURAL GAS USAGE CALCULATIONS

Expected Natural Gas Demands
Green Era Digester Project

METER #1

ITEM	TAG	DECRIPTION	NG INPUT (BTU/HR)	NG INPUT (MBTU/HR)	*NG INPUT (SCF/HR)	MIN PRESSURE		MAX PRESSURE		INLET CONNECTION SIZE
						INWC	PSIG	INWC	PSIG	IN
1	MAU-950	Make-up Air Unit	2,400,000	2,400	2,376	14	0.51	139	5.0	1.50
2	MAU-951	Make-up Air Unit	2,400,000	2,400	2,376	14	0.51	139	5.0	1.50
3	AHU-954A	Air Handler	281,700	282	279	9.0	0.32	14	0.5	0.75
4	AHU-954C	Air Handler	281,700	282	279	9.0	0.32	14	0.5	0.75
5	AHU-954B	Air Handler	281,700	282	279	9.0	0.32	14	0.5	0.75
6	HTR-913	Unit Heater	30,000	30	30	7.0	0.25	13	0.47	0.50
7	HTR-943	Unit Heater	30,000	30	30	7.0	0.25	13	0.47	0.50
8	HTR-980	Unit Heater	30,000	30	30	7.0	0.25	13	0.47	0.50
9	HTR-962	Unit Heater	30,000	30	30	7.0	0.25	13	0.47	0.50
10	F-360	Boiler	3,680,000	3,680	3,644	5.9	0.21	14	0.51	5.00
11	F-361	Boiler	3,680,000	3,680	3,644	5.9	0.21	14	0.51	5.00
12	RTU-900	RTU	150,000	150	149	4.5	0.16	14	0.51	0.75
13	RTU-920	RTU	600,000	600	594	2.5	0.09	14	0.51	1.00
14	RTU-990	RTU	750,000	750	743	2.5	0.09	14	0.51	1.00
TOTAL			**14,625,100**	**14,625**	**14,480**					

METER #2

ITEM	TAG	DECRIPTION	NG INPUT (BTU/HR)	NG INPUT (MBTU/HR)	NG INPUT (SCF/HR)	MIN PRESSURE		MAX PRESSURE		INLET CONNECTION SIZE
						INWC	PSIG	INWC	PSIG	IN
15	E-330	Thermal Oxidizer	2,000,000	2,000	1,980	83	3.00	139	5.0	1.50
16	E-370	Flare	500,000	500	495	55	2.00	83	3.0	1.00
17	E-371	Flare	500,000	500	495	55	2.00	83	3.0	1.00
TOTAL			**3,000,000**	**3,000**	**2,970**					

PEOPLES GAS SERVICE PIPE APPLICATION

PLEASE FILL OUT THE ATTACHED INFORMATION AND EMAIL BACK TO:

NewServiceApplications@peoplesgasdelivery.com

TEL: (773)542-7923 FAX (920)430-6070

Section 1

New Account Name Green Era 83rd Street, LLC		Federal ID # / Social Security # 81-3934327	
Proposed Service Address 650 W. 83rd St., Chicago, IL	Zip 60620	Contact Name Jason Feldman	
Account Phone (708) 792-0649	Contact Phone (708) 792-0649	Contact Fax N/A	Contact Email permits@greenerachicago.com
Account Billing Address 218 N. Jefferson St., Ste.300	City Chicago	State IL	Zip 60661
Description of Building Industrial Process		Construction Status Building (Meter 1) is substantially complete. Process (Meter 2) is mobilizing soon.	
# of Residential Units	# of Commercial Units 2	Total Number of Meters Needed 2	

For single meter only: complete section 2 & 3
For additional meters breakdown: see page 2 and complete section 3

Section 2

Gas Burning Equipment	Quantity	BTU Input/Each	Gas Burning Equipment	Quantity	BTU Input/Each
			Fireplace(s)		
			Unit Heater(s)		
			Make-up Air Heater(s)		

Circle a desired meter location (which side or wall) : N S E W Front

Section 3

The undersigned (herein designated as "Customer") hereby requests the Company to provide gas service facilities at the address shown on this application, and hereby consents and agrees to such installation and to the maintenance of such facilities, all in accordance with the applicable provisions of the Orders of the Illinois Commerce Commission and the Terms and Conditions of Service of, and Riders to, the Company's Schedule of Rates on file with the Illinois Commerce Commission, and Customer further agrees to pay the Company on a jobbing contract basis all costs incurred by the Company installing or relocating gas service facilities not borne by the Company pursuant to such provisions or this application.

The Company agrees to make, at its own expense, ordinary concrete floor repairs and Customer agrees to make, at his own expense, any floor repairs occasioned by service pipe installations involving a type of flooring other than ordinary concrete. Customer further agrees (a) to provide a suitable space, satisfactory to the Company, for the installation of the Company's regulators, meters and metering equipment and, if the meter is not temperature compensated, the temperature in such space shall be maintained at all times by Customer at not less than 40° F; (b) to reimburse the Company for the cost of furnishing and installing any special equipment required by City Ordinance or by the Board of Underwriters, if located along the service pipe installed under this application; (c) to pay for any estimated amount of additional service installation costs occasioned by existing abnormal obstructions which impede normal construction procedures; and (d) to hold the Company harmless from any and all damages to sidewalks, driveways, lawns or other buildings, necessarily caused by the work provided for herein.

MUST draw a diagram of the building below showing windows, doors and the desired meter location

Indicate Direction

See attached site plans for proposed meter locations.

Lot Line

Street Name:

THIS APPLICATION IS SUBJECT TO APPROVAL OF THE CREDIT SECTION OF THE COMPANY

ACCEPTED: SIGN HERE X (CUSTOMER)		DATE X 09/07/2021	CONSENT OF OWNER OF BUILDING **The owner of the building at the address shown above hereby consents to the installation of the service pipe upon the conditions stated in the above agreement.**
Print Jason Feldman		TITLE CEO	
ADDRESS X 650 W 83rd St., Chicago, IL		ZIP CODE 60620	OWNER Green Era 83rd Street, LLC / DATE 09/07/2021

PEOPLES GAS
NATURAL GAS DELIVERY

Service Pipe Application Attachment

NewServiceApplications@peoplesgasdelivery.com

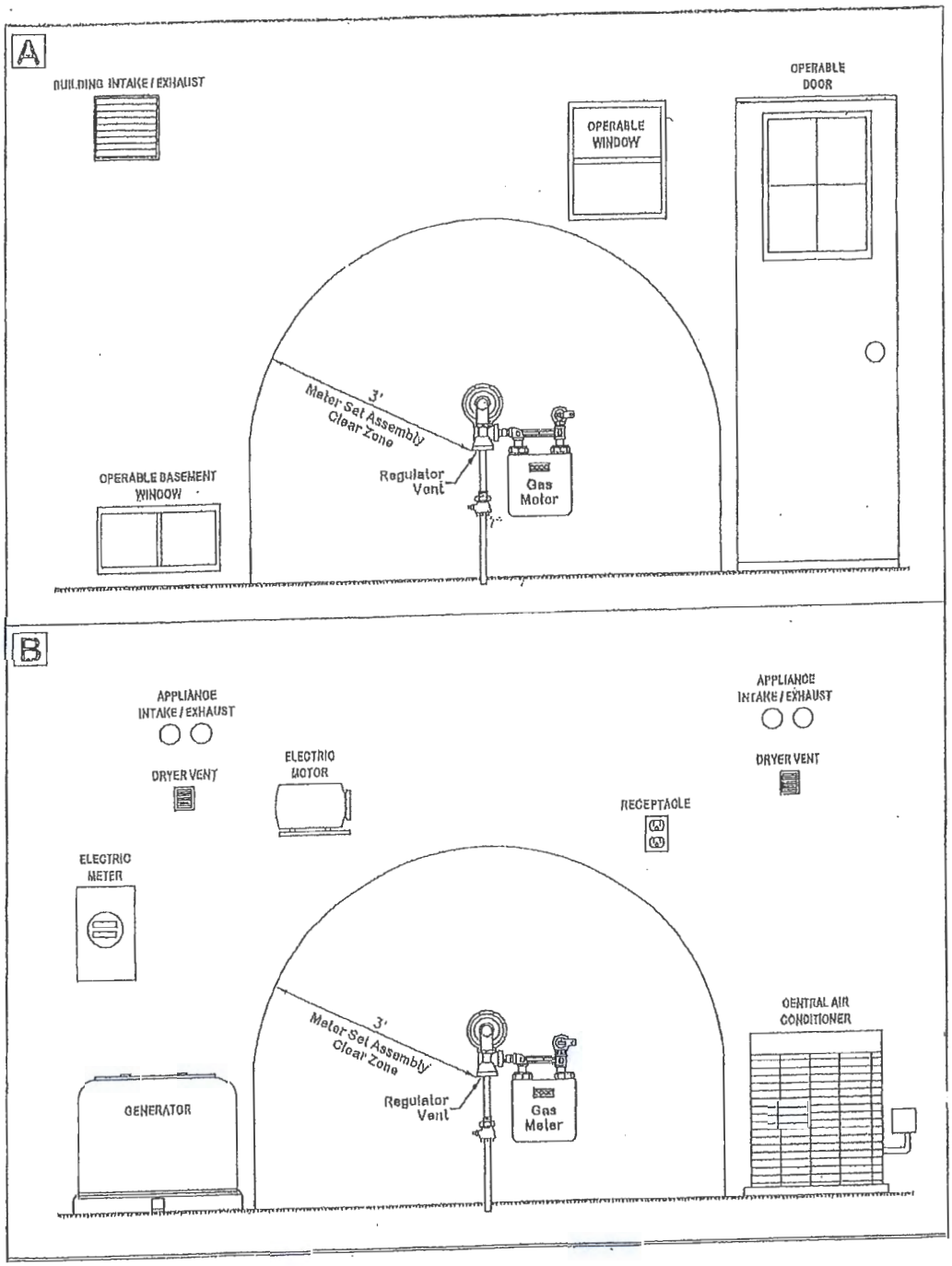
Tel: (773) 542-7923

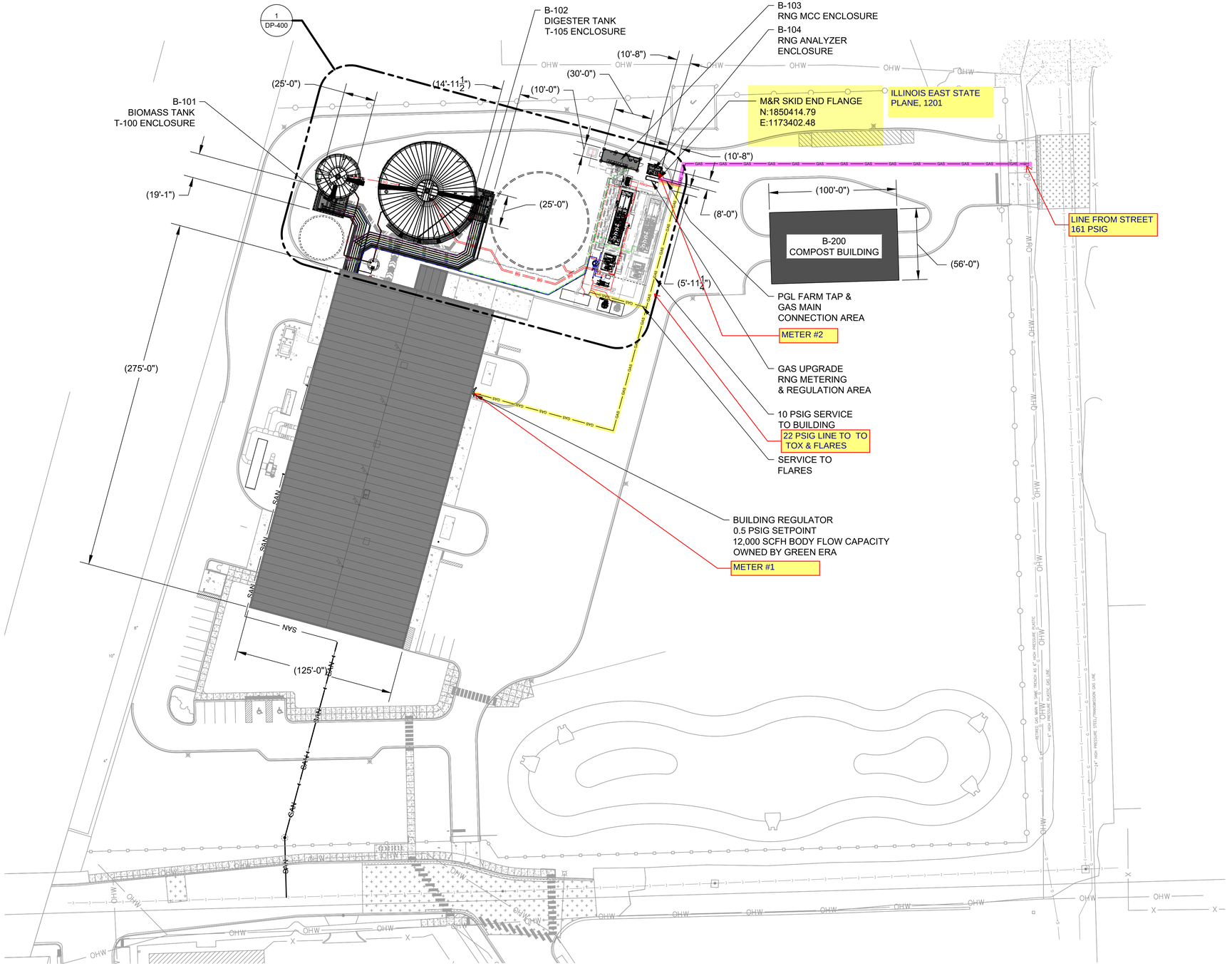
Fax: (920) 430-6070

Service Pipe Application

Appliances

Address	Unit #	Qty	Furnace BTU	Water Heater BTU	Range BTU	Dryer BTU	Fireplace BTU	Boiler BTU	Rooftop BTU	Unit Heater BTU	Other BTU	Total BTU
650 W. 83rd St., Chicago, IL	1	1							150,000			150,000
650 W. 83rd St., Chicago, IL	1	1							750,000			750,000
650 W. 83rd St., Chicago, IL	1	1							600,000			600,000
650 W. 83rd St., Chicago, IL	1	2						3,680,000				7,360,000
650 W. 83rd St., Chicago, IL	1	3									281,700	845,000
650 W. 83rd St., Chicago, IL	1	4								30,000		120,000
650 W. 83rd St., Chicago, IL	1	2									2,400,000	4,800,000
650 W. 83rd St., Chicago, IL	2	1									2,000,000	2,000,000
650 W. 83rd St., Chicago, IL	2	2									500,000	500,000


A
BUILDING INTAKE / EXHAUST
OPERABLE WINDOW
OPERABLE DOOR
3'
Meter Set Assembly Clear Zone
Regulator Vent
Gas Meter
OPERABLE BASEMENT WINDOW
B
APPLIANCE INTAKE / EXHAUST
DRYER VENT
ELECTRIC MOTOR
APPLIANCE INTAKE / EXHAUST
DRYER VENT
RECEPTACLE
ELECTRIC METER
3'
Meter Set Assembly Clear Zone
Regulator Vent
Gas Meter
CENTRAL AIR CONDITIONER
GENERATOR



GREEN ERA
PLANT YARD PIPING

SCALE: 1" = 40'-0"

0 40' 80'

NO.	DATE
BY	
REVISION	
NO.	DATE
BY	
REVISION	
NO.	DATE
BY	
REVISION	

GREEN ARROW

2759 LONG ROAD
WOOSTER, OH 44691

GREEN ERA
PLANT YARD PIPING

GREEN ERA
650 W. 83RD S.T.
CHICAGO, IL 60620

AREA	CHECKED BY
	NM
JOB NO.	DRAWN BY
1512	BR
SCALE	DATE
SEE NOTE	02/12/2021
DWG NO.	
SHEET NO.	
DP-100	

Green Era Electrical Service Transformer Sizing

Prepared by: Chris Yoakum
Green Arrow
7-26-21

Sent to Rob Adams, Chuck Anderson, Rick Cisterna
CC: Jason Feldman, Ryan Huddleston, Ned Mast, Clemens Halene

The following tables describe the full load and estimated power usage for the plant. At 80% of full load the main building is at 96% of transformer capacity. The transformers will be leased from ComEd so it will fall on them to service the transformers. As long as the oil is checked periodically the transformer life should not be degraded. The benefit of upsizing a transformer is the peak electrical efficiency is reached between 30-60% and drops by 0.5% to 1.5% as the load approaches 100%.

Main Building 750KVA Transformer			
Equipment	kW	KVA	80% Full Load KVA
MCC-1A Phase I Motor Loads	77.7		
MCC-1B Phase I Motor Loads	56.25		
MCC-2A Phase I Motor Loads	109.875		
MCC-2B Phase I Motor Loads	102		
W-038 Odor Control Blower	93.75		
S-063 Separation Mill Motor	90		
MCC-HVAC	155		
LP-1 Lighting Panel	59.5		
CP-1, CP-2 Control Power Panels	25.5		
Total	**769.575**	905	724
MCC-1A Phase II (Separation Mill)	37.95	45	
S-061 (Separation Mill)	90	106	
MCC-1B Phase II (Belt Press)	14.25	17	
MCC-2A Phase II (Tanks)	52.5	62	
MCC-2B Phase II (Pumps)	11.25	13	
Total	**205.95**	242	194
Requested in ComEd Application 11/18/20	**1,600**	1882	1506

Green Era Electrical Service Transformer Sizing

Prepared by: Chris Yoakum
Green Arrow
7-26-21

Guild provided estimated power usage at 65% of motor nameplate in a quote from 10/16/20 prepared by Tyler Russell. This coefficient was then applied for the entire gas processing area.

Gas Upgrade 500KVA Transformer			
Equipment	kW	KVA	65% Full Load KVA
Gas Upgrading Phase I	220	259	168
Additional Gas Processing Motors	72	85	55
LP-300 Lighting & Control PowerPanel	63.75	75	49
Total	**355.75**	**419**	**272**
Gas Upgrading Phase II	**177**	208	135
Requested in ComEd Application 11/18/20	**633**	745	484

COMMERCIAL & INDUSTRIAL LOAD INFORMATION

FORM TO BE COMPLETED BY QUALIFIED ELECTRICAL PROFESSIONAL

SITE & BUILDING INFORMATION

PROJECT NAME	PROJECT TYPE	EXISTING COMED ACCOUNT #
Green Era Sustainability, LLC	Factory	

SITE ADDRESS	CITY	ZIP CODE
650 W. 83rd Street	Chicago	60620

REQUESTED SERVICE

☑ Permanent ☐ Temporary

UNIT TYPE (IF APPLICABLE)

☐ Residential ☑ Commercial

RESIDENTIAL # OF UNITS	TOTAL RESIDENTIAL SQ. FOOTAGE	COMMERCIAL # OF UNITS	TOTAL COMMERCIAL SQ. FOOTAGE
		1	34,375

HOURS OF NORMAL OPERATION

Start: ☐ AM ☐ PM End: ☐ AM ☐ PM ☑ 24-hour

EQUIPMENT AND VOLTAGE

PREFERRED SERVICE EQUIPMENT TYPE

☑ Underground ☐ Overhead ☐ Vault/High-rise ☐ Outdoor Lighting

SERVICE VOLTAGE

☐ 120/240V 1-phase 3-wire ☐ 120/240V 3-phase 4-wire ☐ 120/208V 3-phase 4-wire ☑ 277/480V 3-phase 4-wire

☐ 480V 3-phase 3-wire (B-phase grounded, not allowed in Chicago) ☐ 480V 3-phase 3-wire (ungrounded, req. special equipment & approval)

☐ 4kV ☐ 12kV ☐ 34kV ☐ Other:

SWITCH INFORMATION (if more than one, please attach the following information per switch)

SWITCH NAME	# TOTAL SWITCHES FOR PROJECT	# SWITCHES IDENTICAL TO THIS APP
SWGR-2, 52-P2	1	

SWITCH LOCATION, IF KNOWN	SWITCH SIZE (AMPS)	SIZE OF CONDUCTOR
Outdoor Gas Processing Area	1200A	600kcmil

SWITCH RATING (%)	NUMBER OF SECONDARY SETS	CONDUCTOR MATERIAL
100	3	☑ CU ☐ AL

COMMERCIAL & INDUSTRIAL LOAD INFORMATION

FORM TO BE COMPLETED BY QUALIFIED ELECTRICAL PROFESSIONAL

PROJECT NAME	
	Green Era Sustainability, LLC
SWITCH NAME	
	SWGR-2, 52-P2

LOAD INFORMATION (all loads should be shown in kW, with a power factor of .85 used for conversion from KVA)

CATEGORY	DESCRIPTION	I-PHASE CONNECTED LOAD	I-PHASE DIVERSIFIED CAPACITY*	3-PHASE CONNECTED LOAD	3-PHASE DIVERSIFIED CAPACITY*
Lighting	Skid	2.0	0.5		
Appliances					
Receptacle	Outdoor	1.8	0.5		
Process Heat	Trace	15	1.0		
Water Heat					
Motors**	Process			614.5	0.67
HVAC/Heating					
HVAC/Cooling					
Ventilation-All Year					
Other					
Total		18.8	0.9	614.5	0.67

**Diversify connected load per Chicago Electrical Code in the City of Chicago and applicable areas, diversify per National Electrical Code in all other areas.*

***Please provide mechanical switchboard schedule.*

COMMERCIAL & INDUSTRIAL LOAD INFORMATION

FORM TO BE COMPLETED BY QUALIFIED ELECTRICAL PROFESSIONAL

PROJECT NAME
Green Era Sustainability, LLC

SWITCH NAME
SWGR-2, 52-P2

MOTOR INFORMATION

EQUIPMENT TYPE	QTY	VOLTAGE	HP	STARTING AMPS	FULL LOAD AMPS	STARTER TYPE	STARTER FLA COEFFICIENT	# OF STARTS PER DAY	NEMA CODE	POSITION IN STARTING SEQUENCE
Vac Compressor	2	460	75	294	96	Soft-Str		4		
Feed Compressor	2	460	150	540	180	VFD		4		
UP Compressor	2	460	40	128	52	VFD		1		
Blowers	2	460	20	73	27	VFD		4		
Coolers	2	460	20	81	27	Soft-Str		4		
Chiller	1	460	25	187	34	FVNR		4		
Oil Cooler	1	460	10	43	14	VFD		4		
Air Compressor	2	460	5	42	7.6	FVNR		4		

Please provide mechanical switchboard schedule.

WELDER INFORMATION

DESCRIPTION	QTY	VOLTAGE	SIZE (KVA)	TYPE	FULL LOAD AMPS	P.F. AT PEAK	STARTER FLA COEFFICIENT	WELDS PER MINUTE	CYCLES PER WELD	HOUR PER DAY USE

Please fill out welder table if welder load required.

COMMERCIAL & INDUSTRIAL PROJECT INFORMATION

SITE INFORMATION

PROJECT NAME	CONTACT NAME	
Green Era Sustainability, LLC		
SITE ADDRESS	**CITY**	**ZIP CODE**
650 W. 83rd Street	Chicago	60620

CONTACT EMAIL	CONTACT PHONE	TOTAL NUMBER OF SERVICE ENTRANCE LOCATIONS
ELECTRICAL PERMIT #	**DATE OF GROUNDBREAKING**	**TOTAL NUMBER OF SWITCHES (Points of Service)**
DATE COMED CAN BEGIN WORK	**PREFERRED SERVICE DATE**	**TOTAL NUMBER OF METERS REQUESTED**

BUSINESS INFORMATION

LEGAL NAME OF ENTITY (ELECTRIC CONSUMER)	TAX I.D.	EXISTING COMED ACCOUNT #

☐ Corporation ☐ Partnership ☐ Sole Proprietor ☐ Other:

PRINCIPLE(S) to sign agreements for service, easements, etc.

PROPERTY OWNER	PHONE
BUILDING OWNER	**PHONE**
BUILDING MANAGER	**PHONE**

COMMERCIAL & INDUSTRIAL PROJECT INFORMATION

PROJECT NAME
Green Era Sustainability, LLC

MAILING ADDRESS FOR AGREEMENTS

COMPANY	EMAIL	PHONE	FAX

ADDRESS	CITY	STATE	ZIP CODE

MAILING ADDRESS FOR ELECTRIC BILLS

COMPANY	EMAIL	PHONE	FAX

ADDRESS	CITY	STATE	ZIP CODE

PROJECT CONTACTS

CONSULTING ENGINEER	FIRM NAME
Charles Anderson	Meade Electric Company

ADDRESS	CITY	STATE	ZIP CODE
625 Willowbrook Center Parkway	Willowbrook	IL	60527

EMAIL	PHONE	FAX
cea@meade100.com	708-588-2514	708-588-2501

GENERAL CONTRACTOR	FIRM NAME

ADDRESS	CITY	STATE	ZIP CODE

EMAIL	PHONE	FAX

COMMERCIAL & INDUSTRIAL PROJECT INFORMATION

PROJECT NAME
Green Era Sustainability, LLC

ELECTRICAL CONTRACTOR	FIRM NAME
Charles Anderson	Meade Electric Company

ADDRESS	CITY	STATE	ZIP CODE
625 Willowbrook Center Parkway	Willowbrook	IL	60527

EMAIL	PHONE	FAX
cea@meade100.com	708-588-2514	708-588-2501

OTHER	ROLE	FIRM NAME

ADDRESS	CITY	STATE	ZIP CODE

EMAIL	PHONE	FAX

REQUIRED DOCUMENTS

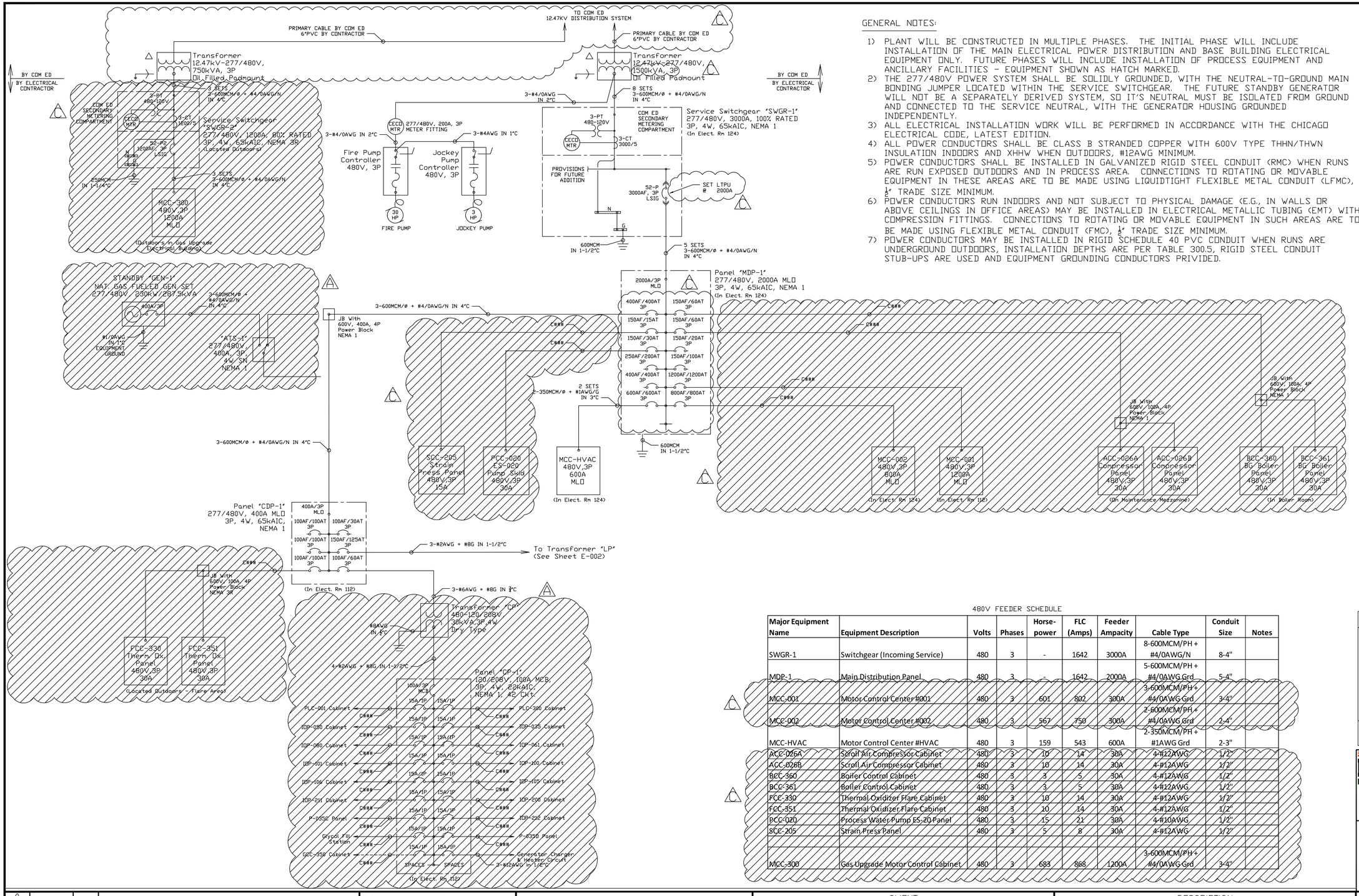
The following documents may be required (items are required for non-overhead services):

- Plat of Survey with legal description of property (for easement, if required)
- Site Plan showing building relative to property lines and elevation information for multi-story buildings – mark service entrance location(s)
- Civil drawings (showing water, sewer, gas, phone, electric, pavement, grading, etc.)
- Complete electrical drawings and/or load detail sheets

INFORMATION PROVIDED BY

SIGNATURE	PRINT NAME	DATE

Submit your information via the New Business Portal online form or email your completed pdf application to ServiceApplications@ComEd.com.



GENERAL NOTES:

1) PLANT WILL BE CONSTRUCTED IN MULTIPLE PHASES. THE INITIAL PHASE WILL INCLUDE INSTALLATION OF THE MAIN ELECTRICAL POWER DISTRIBUTION AND BASE BUILDING ELECTRICAL EQUIPMENT ONLY. FUTURE PHASES WILL INCLUDE INSTALLATION OF PROCESS EQUIPMENT AND ANCILLARY FACILITIES - EQUIPMENT SHOWN AS HATCH MARKED.
2) THE 277/480V POWER SYSTEM SHALL BE SOLIDLY GROUNDED, WITH THE NEUTRAL-TO-GROUND MAIN BONDING JUMPER LOCATED WITHIN THE SERVICE SWITCHGEAR. THE FUTURE STANDBY GENERATOR WILL NOT BE A SEPARATELY DERIVED SYSTEM, SO IT'S NEUTRAL MUST BE ISOLATED FROM GROUND AND CONNECTED TO THE SERVICE NEUTRAL, WITH THE GENERATOR HOUSING GROUNDED INDEPENDENTLY.
3) ALL ELECTRICAL INSTALLATION WORK WILL BE PERFORMED IN ACCORDANCE WITH THE CHICAGO ELECTRICAL CODE, LATEST EDITION.
4) ALL POWER CONDUCTORS SHALL BE CLASS B STRANDED COPPER WITH 600V TYPE THHN/THWN INSULATION INDOORS AND XHHW WHEN OUTDOORS, #12AWG MINIMUM.
5) POWER CONDUCTORS SHALL BE INSTALLED IN GALVANIZED RIGID STEEL CONDUIT (RMC) WHEN RUNS ARE RUN EXPOSED OUTDOORS AND IN PROCESS AREA. CONNECTIONS TO ROTATING OR MOVABLE EQUIPMENT IN THESE AREAS ARE TO BE MADE USING LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC), ½" TRADE SIZE MINIMUM.
6) POWER CONDUCTORS RUN INDOORS AND NOT SUBJECT TO PHYSICAL DAMAGE (E.G., IN WALLS OR ABOVE CEILINGS IN OFFICE AREAS) MAY BE INSTALLED IN ELECTRICAL METALLIC TUBING (EMT) WITH COMPRESSION FITTINGS. CONNECTIONS TO ROTATING OR MOVABLE EQUIPMENT IN SUCH AREAS ARE TO BE MADE USING FLEXIBLE METAL CONDUIT (FMC), ½" TRADE SIZE MINIMUM.
7) POWER CONDUCTORS MAY BE INSTALLED IN RIGID SCHEDULE 40 PVC CONDUIT WHEN RUNS ARE UNDERGROUND OUTDOORS, INSTALLATION DEPTHS ARE PER TABLE 300.5, RIGID STEEL CONDUIT STUB-UPS ARE USED AND EQUIPMENT GROUNDING CONDUCTORS PRIVIDED.

480V FEEDER SCHEDULE

Major Equipment Name	Equipment Description	Volts	Phases	Horse-power	FLC (Amps)	Feeder Ampacity	Cable Type	Conduit Size	Notes
SWGR-1	Switchgear (Incoming Service)	480	3	-	1642	3000A	8-600MCM/PH + #4/0AWG/N	8-4"	
MDP-1	Main Distribution Panel	480	3	-	1642	2000A	5-600MCM/PH + #4/0AWG Grd	5-4"	
MCC-001	Motor Control Center #001	480	3	601	802	300A	3-600MCM/PH + #4/0AWG Grd	3-4"	
MCC-002	Motor Control Center #002	480	3	567	750	300A	2-600MCM/PH + #4/0AWG Grd	2-4"	
MCC-HVAC	Motor Control Center #HVAC	480	3	159	543	600A	2-350MCM/PH + #1AWG Grd	2-3"	
ACC-026A	Scroll Air Compressor Cabinet	480	3	10	14	30A	4-#12AWG	1/2"	
ACC-026B	Scroll Air Compressor Cabinet	480	3	10	14	30A	4-#12AWG	1/2"	
BCC-360	Boiler Control Cabinet	480	3	3	5	30A	4-#12AWG	1/2"	
BCC-361	Boiler Control Cabinet	480	3	3	5	30A	4-#12AWG	1/2"	
FCC-330	Thermal Oxidizer Flare Cabinet	480	3	10	14	30A	4-#12AWG	1/2"	
FCC-351	Thermal Oxidizer Flare Cabinet	480	3	10	14	30A	4-#12AWG	1/2"	
PCC-020	Process Water Pump ES-20 Panel	480	3	15	21	30A	4-#10AWG	1/2"	
SCC-205	Strain Press Panel	480	3	5	8	30A	4-#12AWG	1/2"	
MCC-300	Gas Upgrade Motor Control Cabinet	480	3	683	868	1200A	3-600MCM/PH + #4/0AWG Grd	3-4"	

PLAN NOTES:

REFER TO SHEET E-002 FOR CONTINUATION OF SINGLE LINE DIAGRAM.

Prepared Under My Hand and Seal

CHARLES E. ANDERSON 62-042190 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

Expires: 11/30/2021

MEADE
625 Willow□roo□ Ctr P□wy
Willow□roo□, IL 60527
Phone: 708-588-2500
www.meade100.com

IL Design Firm □184002159-0002
Expires 04/30/2021

LaSalle Associates Consulting, Inc.
605 Wildwood Ln. West Chicago, IL 60185
630-293-9022 www.lasalleassoc.com

REV	DATE	BY	DESCRIPTION
E			
D			
C	11-16-20	CEA	ADDED GAS UPGRADE SERVICE & UPDATED MOTOR LIST
B	10-16-20	CEA	PIPE CHASE - NO ELECTRICAL CHANGE
A	10-09-20	CEA	ISSUED FOR CONSTRUCTION

SCALE: NONE
DATE: 12-11-19
DRAWN: CEA
CHECKED: RFC
APPROVED: RAA

ACEng
www.ac-engineering.com

CLIENT

GREEN ERA SUSTAINABILITY, LLC
ANAEROBIC DIGESTER PROJECT
650 W. 83RD STREET
CHICAGO, IL. 60620

DESCRIPTION

ELECTRICAL SINGLE LINE DIAGRAM
277/480V ELECTRICAL SERVICE

PROJECT NO:
1019.001

SHEET:
E-001

MCC-001 SCHEDULE (FUTURE PHASE) - 480V, 1200A, 3 PHASE, 3 WIRE

P&ID Tag	Description	Horsepower	FLC (Amps)	Cable Type	Conduit Size	Disconnect Size	Notes
G-050	Macerator	7.5	11.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-060	Solids Pit Sump Pump	1	2.1	4-#12AWG	1/2"	30A	FVNR
W-060	Solids Hopper Exhaust Fan	0.75	1.6	4-#12AWG	1/2"	30A	FVNR
Y-060A	Solids Hopper Auger	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-060B	Solids Hopper Auger	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-060C	Solids Hopper Auger	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-060D	Solids Hopper Auger	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-060E	Solids Hopper Auger	10	14.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-060F	Solids Receiving Incline Auger	20	27.0	3-#8AWG+10Grd	3/4"	60A	PowerFlex 525 VFD
HPU-061	Separation Mill Hydraulic Power Unit	2	3.4	4-#12AWG	1/2"	30A	FVNR
S-061	Separation Mill Main Drive	150	180.0	3-#4/0AWG+4Grd	2"	400A	Soft Starter
W-061	Separation Mill Exhaust Fan	0.75	1.6	4-#12AWG	1/2"	30A	FVNR
Y-061A	Separation Mill Substrate Conveyor	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-061B	Separation Mill Reject Auger	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-062A	Solids Hopper Auger	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-062B	Solids Hopper Auger	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-062C	Solids Hopper Auger	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-062D	Solids Hopper Auger	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-062E	Solids Hopper Auger	10	14.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-062F	Solids Receiving Incline Auger	20	27.0	3-#8AWG+10Grd	3/4"	60A	PowerFlex 525 VFD
HPU-063	Separation Mill Hydraulic Power Unit	2	3.4	4-#12AWG	1/2"	30A	FVNR
S-063	Separation Mill Main Drive	150	180.0	3-#4/0AWG+4Grd	2"	400A	Soft Starter
W-063	Separation Mill Exhaust Fan	0.75	1.6	4-#12AWG	1/2"	30A	FVNR
Y-063A	Separation Mill Substrate Conveyor	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-063B	Separation Mill Reject Auger	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-064	Solids Receiving Area Sump Pump	1	2.1	4-#12AWG	1/2"	30A	FVNR
Y-065A	Grit Screw Conveyor	10	14.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-065B	Grit Auger	3	4.8	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-065C	Grit Incline Conveyor	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-070A	Pulp Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
P-070B	Pulp Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
A-210A	Bulk Polymer Tank Agitator	7.5	11.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
A-210B	Polymer Make-Down Tank Mixer	1.5	3.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
A-210C	Spare Tank Agitator	7.5	11.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-210A	Neat Polymer Dosing Pump	0.5	1.1	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
A-211	Flocculation Tank Mixer	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-211B	Polymer Dosing Pump	1	2.1	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-211C	Water Booster Pump	10	14.0	4-#12AWG	1/2"	30A	Soft Starter
W-211	Belt Press Exhaust Fan	0.75	1.6	4-#12AWG	1/2"	30A	FVNR
Y-211A/B	Belt Press Belt Drive	3	4.8	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
A-212	Flocculation Tank Mixer	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-212B	Polymer Dosing Pump	1	2.1	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-212C	Water Booster Pump	10	14.0	4-#12AWG	1/2"	30A	Soft Starter
W-212	Belt Press Exhaust Fan	0.75	1.6	4-#12AWG	1/2"	30A	FVNR
Y-212A/B	Belt Press Belt Drive	3	4.8	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-220A	Cake Solids Collection Conveyor	7.5	11.0	4-#12AWG	1/2"	30A	FVNR
Y-220B	Cake Solids Incline Conveyor	10	14.0	4-#12AWG	1/2"	30A	FVNR
Y-220C	Cake Solids Plow Conveyor	10	14.0	4-#12AWG	1/2"	30A	FVNR
Y-220D	Cake Solids Plow	1	2.1	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-225	Cake Solids Area Sump Pump	1	2.1	4-#12AWG	1/2"	30A	FVNR
P-250A	Filtrate Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
P-250B	Filtrate Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
P-252	Filtrate Area Sump Pump	1	2.1	4-#12AWG	1/2"	30A	FVNR
	TOTAL CONNECTED =	601	802.0				

MCC-002 SCHEDULE (FUTURE PHASE) - 480V, 1200A, 3 PHASE, 3 WIRE

P&ID Tag	Description	Horsepower	FLC (Amps)	Cable Type	Conduit Size	Disconnect Size	Notes
P-035A	Odor Scrubber First Stage Circulation Pump	20	27.0	3-#8AWG+10Grd	3/4"	60A	FVNR
P-035B	Odor Scrubber Second Stage Circulation Pump	20	27.0	3-#8AWG+10Grd	3/4"	60A	FVNR
W-035	Odor Scrubber Blower	200	240.0	3-#350MCM+3Grd	3"	400A	PowerFlex 755 VFD
P-050A	Liquid Receiving Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
P-050B	Liquid Receiving Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
P-050C	Liquid Receiving Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
P-050D	Liquid Receiving Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
P-055	Liquid Receiving Area Sump Pump	1	2.1	4-#12AWG	1/2"	30A	FVNR
Y-067A	Reject Collection Conveyor	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-067B	Reject Incline Conveyor	7.5	11.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
Y-067C	Reject Discharge Conveyor	5	7.6	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-080A	Heating & Dosing Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
P-080B	Heating & Dosing Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
P-090A	Screening & Dosing Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
P-090B	Screening & Dosing Pump	15	21.0	3-#10AWG+12Grd	1/2"	30A	PowerFlex 525 VFD
A-100	T-100 Vertical Mixer	30	40.0	3-#8AWG+10Grd	3/4"	60A	PowerFlex 755 VFD
A-101	T-101 Vertical Mixer	30	40.0	3-#8AWG+10Grd	3/4"	60A	PowerFlex 755 VFD
A-105	T-105 Vertical Mixer	30	40.0	3-#8AWG+10Grd	3/4"	60A	PowerFlex 755 VFD
A-106	T-106 Vertical Mixer	30	40.0	3-#8AWG+10Grd	3/4"	60A	PowerFlex 755 VFD
P-120A	Tank Overflow Pit Sump Pump	10	14.0	4-#12AWG	1/2"	30A	FVNR
P-120B	Tank Overflow Pit Sump Pump	10	14.0	4-#12AWG	1/2"	30A	FVNR
P-211A	Belt Press Digestate Feed Pump	10	14.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-212A	Belt Press Digestate Feed Pump	10	14.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-360	Boiler Glycol Circulator Pump	3	4.8	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-361	Boiler Glycol Circulator Pump	3	4.8	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
P-401A	Heat Exchanger Injection Pump	3	4.8	4-#12AWG	1/2"	30A	Integrated VFD
P-401B	Heat Exchanger Injection Pump	3	4.8	4-#12AWG	1/2"	30A	Integrated VFD
P-401C	T-100 Heat Circulator Pump	5	7.6	4-#12AWG	1/2"	30A	Integrated VFD
P-401D	T-105 Heat Circulator Pump	5	7.6	4-#12AWG	1/2"	30A	Integrated VFD
P-401E	Future Heat Injection Pump	3	4.8	4-#12AWG	1/2"	30A	FVNR
P-401F	Future Heat Injection Pump	3	4.8	4-#12AWG	1/2"	30A	FVNR
	TOTAL CONNECTED =	567	750.3				

MCC-HVAC SCHEDULE - 480V, 600A, 3 PHASE, 3 WIRE

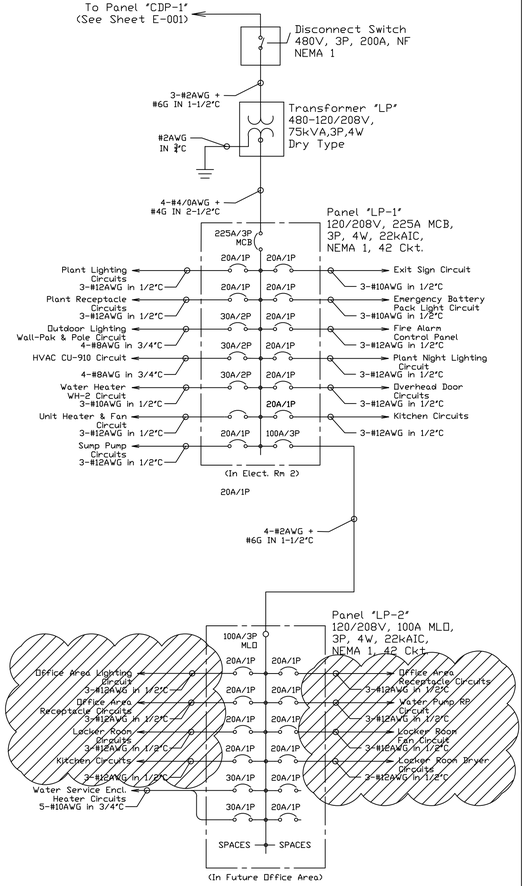
Device P&ID Tag	Device Description	Horse-power	FLC (Amps)	Cable Type	Conduit Size	Disc. Switch Size	Notes
DWP	DOMESTIC WATER PUMP	3	4.8	4-#12AWG	1/2"	30A	
PWP	PROCESS WATER PUMP SKID	15	22.0	3-#10AWG+12Grd	1/2"	30A	
P360	HVAC WATER PUMP	3	4.8	4-#12AWG	1/2"	30A	Future
P361	HVAC WATER PUMP	3	4.8	4-#12AWG	1/2"	30A	Future
WH-1	WATER HEATER - 45kW ELECTRIC	-	54.0	3-#4AWG+8Grd	1"	100A	
EF-941A	FAN - BOILER ROOM CEILING	20	27.0	3-#8AWG+10Grd	3/4"	60A	VFD
EF-941B	FAN - BOILER ROOM CEILING	20	27.0	3-#8AWG+10Grd	3/4"	60A	VFD, Future
EF-952	FAN - BELT PRESS ROOM	30	40.0	3-#8AWG+10Grd	3/4"	60A	VFD
EF-953	FAN - PROCESS ROOM	50	65.0	3-#4AWG+8Grd	1"	100A	VFD
AH-954A	AIR HANDLER - INDOOR	5	7.6	4-#12AWG	1/2"	30A	
AH-954B	AIR HANDLER - INDOOR	5	7.6	4-#12AWG	1/2"	30A	
AH-954C	AIR HANDLER - INDOOR	5	7.6	4-#12AWG	1/2"	30A	
RTU-900	RTU - CENTER OFFICE AREA	-	21.0	3-#10AWG+12Grd	1/2"	30A	
RTU-920	RTU - SOUTH ROOMS	-	27.9	3-#8AWG+10Grd	3/4"	60A	Future
RTU-990	RTU - VISITOR CENTER	-	85.1	3-#3AWG+8Grd	1"	100A	Future
MAU-950	AIR HANDLER - MAKE-UP	-	68.4	3-#4AWG+8Grd	1"	100A	
MAU-951	AIR HANDLER - MAKE-UP	-	68.4	3-#4AWG+8Grd	1"	100A	
	TOTAL CONNECTED LOAD =	159.00	543.0				

MCC-300 SCHEDULE (FUTURE PHASE) - 480V, 1200A, 3 PHASE, 4 WIRE

P&ID Tag	Description	Horsepower	FLC (Amps)	Cable Type	Conduit Size	Disconnect Size	Notes
E-300	Biogas Chiller	25	34.0	3-#8AWG+10Grd	3/4"	30A	Circuit Breaker
HT-300	Biogas Piping Heat Trace	15	21.0	3-#10AWG+12Grd	1/2"	30A	Circuit Breaker
P-300	Tank Yard Condensate Sump Pump	1	2.1	4-#12AWG	1/2"	30A	FVNR
W-302A	Biogas Blower	20	27.0	3-#8AWG+10Grd	3/4"	60A	PowerFlex 755 VFD
W-302B	Biogas Blower	20	27.0	3-#8AWG+10Grd	3/4"	60A	PowerFlex 755 VFD
C-310	Feed Compressor	150	180.0	3-#4/0AWG+4Grd	2"	400A	PowerFlex 755 VFD
E-310	Feed Compressor Gas/Oil Cooler	10	14.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
C-315	Vacuum Compressor	75	96.0	3-#1AWG+6Grd	1-1/4"	200A	Soft Starter
E-315	Vacuum Compressor Oil Cooler	0.75	1.6	4-#12AWG	1/2"	30A	FVNR
C-317	Air Compressor	5	7.6	4-#12AWG	1/2"	30A	FVNR
E-320	Utility Pressure Compressor	40	52.0	3-#6AWG+8Grd	3/4"	100A	PowerFlex 755 VFD
E-320	Final Aftercooler	20	27.0	3-#8AWG+10Grd	3/4"	60A	Soft Starter
C-340	Feed Compressor	150	180.0	3-#4/0AWG+4Grd	2"	400A	PowerFlex 755 VFD
E-340	Feed Compressor Gas/Oil Cooler	10	14.0	4-#12AWG	1/2"	30A	PowerFlex 525 VFD
C-345	Vacuum Compressor	75	96.0	3-#1AWG+6Grd	1-1/4"	200A	Soft Starter
E-345	Vacuum Compressor Oil Cooler	0.75	1.6	4-#12AWG	1/2"	30A	FVNR
C-347	Air Compressor	5	7.6	4-#12AWG	1/2"	30A	FVNR
C-350	Utility Pressure Compressor	40	52.0	3-#6AWG+8Grd	3/4"	100A	PowerFlex 755 VFD
E-350	Final Aftercooler	20	27.0	3-#8AWG+10Grd	3/4"	60A	Soft Starter
	TOTAL CONNECTED =	683	867.5				

PANEL CP-1- CRITICAL 120V BRANCH CIRCUIT SCHEDULE

Control Cabinet Name	Equipment Description	Volts	Phases	Feeder Ampacity	Cable Type	Conduit Size	Notes
PLC-001	Main PLC & Network Cabinet	120	1	15A	3-#12AWG	1/2"	
PLC-300	Gas Upgrade PLC & I/O	120	1	15A	3-#12AWG	1/2"	
IOP-035	Odor Control Remote I/O	120	1	15A	3-#12AWG	1/2"	
IOP-050	Receiving Area #1 Remote I/O	120	1	15A	3-#12AWG	1/2"	
IOP-061	Separation Mill Remote I/O	120	1	15A	3-#12AWG	1/2"	
IOP-080	Receiving Area #2 Remote I/O	120	1	15A	3-#12AWG	1/2"	
IOP-100	Biomass Receiving Tank Remote I/O	120	1	15A	3-#12AWG	1/2"	
IOP-105	Digester Tank Remote I/O	120	1	15A	3-#12AWG	1/2"	
IOP-200	Dewatering & Filtrate Area Remote I/O	120	1	15A	3-#12AWG	1/2"	
IOP-211	Belt Press #1 Remote I/O	120	1	15A	3-#12AWG	1/2"	
P-035C Dosing Panel	P-035C Dosing Panel	120	1	15A	3-#12AWG	1/2"	
P-035D Dosing Panel	P-035D Dosing Panel	120	1	15A	3-#12AWG	1/2"	
Glycol Fill Station	Glycol Fill Station	120	1	15A	3-#12AWG	1/2"	
IOP-101	Biomass PFRP Tank Remote I/O	120	1	15A	3-#12AWG	1/2"	
IOP-106	Digester Tank Remote I/O	120	1	15A	3-#12AWG	1/2"	
IOP-212	Belt Press #2 Remote I/O	120	1	15A	3-#12AWG	1/2"	



PLAN NOTES:

REFER TO SHEETS E-202 FOR PANEL "LP-1" AND "LP-2" SCHEDULES.

Prepared Under My Hand and Seal

CHARLES E. ANDERSON 62-042190 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

Expires: 11/30/2021

MEADE
625 Willow□roo□Ctr P□wy
Willow□roo□, IL 60527
Phone: 708-588-2500
www.meade100.com

IL Design Firm □184002159-0002
Expires 04/30/2021

LaSalle Associates Consulting, Inc.
605 Wildwood Ln, West Chicago, IL 60185
630-293-9022 www.lasalleassoc.com

REV	DATE	BY	DESCRIPTION
E			
D			
C	11-16-20	CEA	PROCESS MOTOR LOAD & MCC CHANGES
B	10-16-20	CEA	PIPE CHASE - NO ELECTRICAL CHANGE
A	10-09-20	CEA	ISSUED FOR CONSTRUCTION

SCALE: NONE
DATE: 12-20-19
DRAWN: CEA
CHECKED: RFC
APPROVED: RAA

ACEng
www.ac-engineering.com

CLIENT

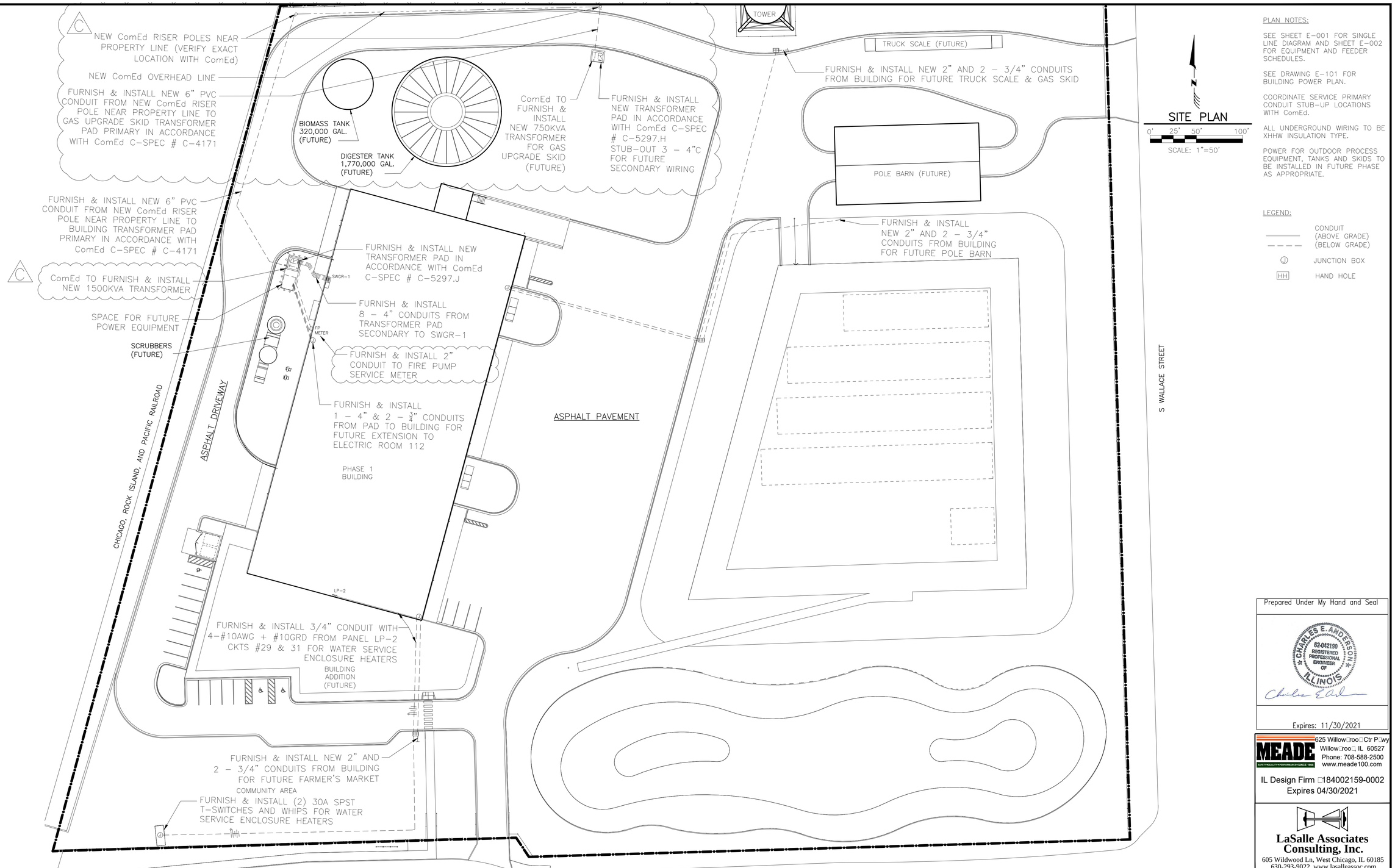
GREEN ERA SUSTAINABILITY, LLC
ANAEROBIC DIGESTER PROJECT
650 W. 83RD STREET
CHICAGO, IL. 60620

DESCRIPTION

ELECTRICAL FEEDERS AND MOTOR CONTROL CENTER SCHEDULES

PROJECT NO:
1019.001

SHEET:
E-002



SITE PLAN

0' 25' 50' 100'

SCALE: 1"=50'

PLAN NOTES:

SEE SHEET E-001 FOR SINGLE LINE DIAGRAM AND SHEET E-002 FOR EQUIPMENT AND FEEDER SCHEDULES.

SEE DRAWING E-101 FOR BUILDING POWER PLAN.

COORDINATE SERVICE PRIMARY CONDUIT STUB-UP LOCATIONS WITH ComEd.

ALL UNDERGROUND WIRING TO BE XHHW INSULATION TYPE.

POWER FOR OUTDOOR PROCESS EQUIPMENT, TANKS AND SKIDS TO BE INSTALLED IN FUTURE PHASE AS APPROPRIATE.

LEGEND:

- CONDUIT (ABOVE GRADE)
- CONDUIT (BELOW GRADE)
- (J) JUNCTION BOX
- HH HAND HOLE

REV	DATE	BY	DESCRIPTION
E			
D			
C	11-16-20	CEA	REVISED COM ED SERVICE FOR GAS UPGRADE SKID
B	10-16-20	CEA	PIPE CHASE - NO ELECTRICAL CHANGE
A	10-09-20	CEA	ISSUED FOR CONSTRUCTION

SCALE: 1" = 32'
DATE: 12-19-19
DRAWN: CEA
CHECKED: RFC
APPROVED: RAA

ACEng
www.ac-engineering.com

CLIENT
GREEN ERA SUSTAINABILITY, LLC
ANAEROBIC DIGESTER PROJECT
650 W. 83RD STREET
CHICAGO, IL. 60620

DESCRIPTION
ELECTRICAL OUTDOOR POWER
SITE PLAN

PROJECT NO: 1019.001

SHEET: E-100

Prepared Under My Hand and Seal

CHARLES E. ANDERSON
62-042199
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

Expires: 11/30/2021

MEADE
625 Willow□roo□Ctr P□wy
Willow□roo□ IL 60527
Phone: 708-588-2500
www.meade100.com

IL Design Firm □184002159-0002
Expires 04/30/2021

LaSalle Associates Consulting, Inc.
605 Wildwood Ln, West Chicago, IL 60185
630-293-9022 www.lasalleassoc.com

ATTACHMENT 5
TRAFFIC STUDY REPORT

TERRA ENGINEERING LTD.

DATE: June 9, 2022

TO: Jason Feldman

FROM: Michael (Chris) Hutchinson, P.E., PTOE

RE: Green Era Liquid Waste Site at 650 West 83rd Street, Chicago, IL

MEMO:

Introduction

TERRA Engineering was asked to perform a preliminary assessment of a proposed development to be situated at the northwest corner of Wallace Street and 83rd Street in the City of Chicago, Illinois. Phase I of the proposed development is to include a food waste facility of approximately 35,000 square feet (s.f.).

Site Location

The site is roughly bounded by the Metra Rail to the west, the Aabbitt Adhesives facility to the north, Wallace Street to the east, and 83rd Street to the south. The project location is shown in Figure 1. Two driveways are proposed for the food waste facility. One driveway intended for trucks on Wallace Street, and one driveway intended for passenger vehicles on 83rd Street. The proposed layout of the site is provided in Figure 2.

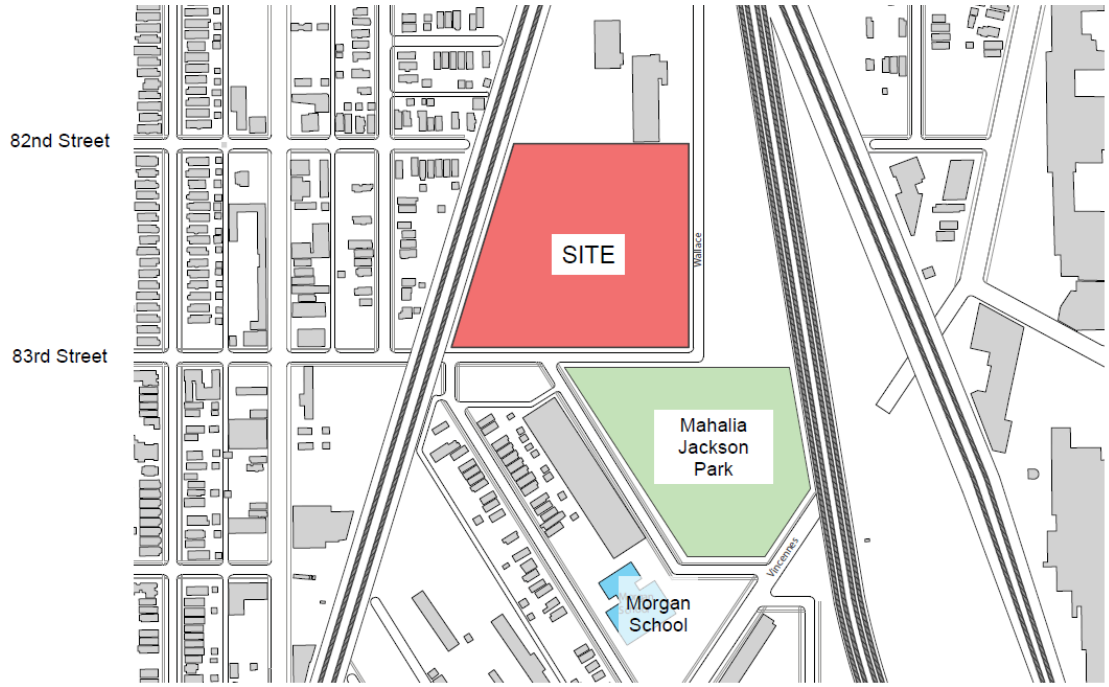


Figure 1 - Project site

MEMORANDUM

TERRA ENGINEERING LTD.

MEMORANDUM

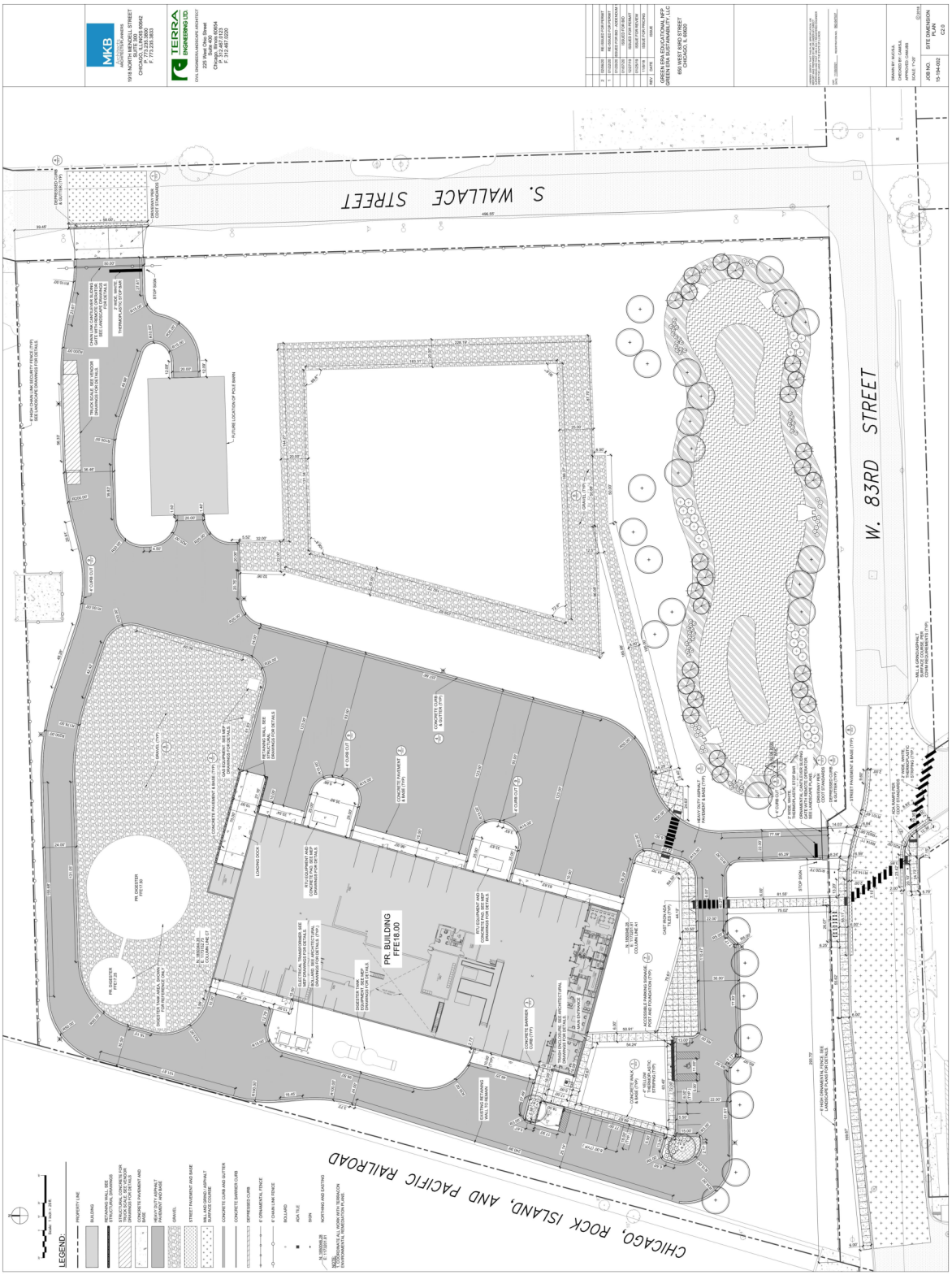


Figure 2 - Proposed site layout

The roadways included as part of the study area around the site are described as follows:

81st Street is a two-lane (one lane in each direction) road running in the east-west direction. Central Avenue serves primarily residential areas and a few businesses and schools. IDOT functionally classifies it as a local road. There is no posted speed limit on 81st Street near the project site other than school speed limit signs that limit the speed to 20 miles per hour (mph). Sidewalks exist on both sides of the street. On-street parking is allowed on 81st Street. There are no designated bike lanes on the street. Approximately 60 feet east of Wallace Street, 81st Street runs below a bridge which has a 13 foot 10 inch clearance.

Wallace Street is a two-lane (one lane in each direction) road running in the north-south direction between W. 83rd Street to the south and W. 80th Street. The section adjacent to the project starting at 83rd Street is in very poor condition to the point of the pavement appearing to be mostly gravel. There are no sidewalks or other facilities along this section of roadway.

83rd Street is a two-lane (one lane in each direction) road running in the east-west direction in the project area to the east of S. Birkhoff Avenue to wear the roadway turns north as S. Wallace Street the roadway is also very deteriorated to the point of being mostly gravel. To the west of S. Birkhoff the pavement is in good condition with one travel lane in each direction. There is a Metra bridge with a low clearance of 11 foot 8 inches just west of the site.

Existing Traffic

TERRA Engineering collected traffic data on May 19th, 2022 at the following locations:

- 81st Street at Wallace Street
- 83rd Street at Birkhoff Ave

The data was collected from 6:00 AM to 6:00 PM to include the morning and evening peak hours of vehicle traffic, colloquially called “rush hour,” and the midday peak hour of traffic that occurs around noon. The peak hours of traffic for each intersection did not always coincide. The start time of the peak hour of traffic for some intersections began earlier or later than other intersections. Although the peak hour of traffic at each intersection do not always occur together, using the volumes from the hour of highest observed traffic volume at each intersection provides a slightly more conservative calculation for intersection performance. Table 1 shows the starting time of peak hour of traffic for each intersection in the study area. Figure 3 shows the vehicle volume for each turning movement during the peak hour of traffic. Figure 4 shows the volumes for light vehicles and Figure 5 shows the volumes for trucks.

Table 1 – Peak Hours of Traffic

	AM	Midday	PM
81st St & Wallace St	7:30 AM	11:45 AM	3:00 PM
83rd St & Birkhoff St	7:30 AM	12:45 PM	3:30 PM

MEMORANDUM

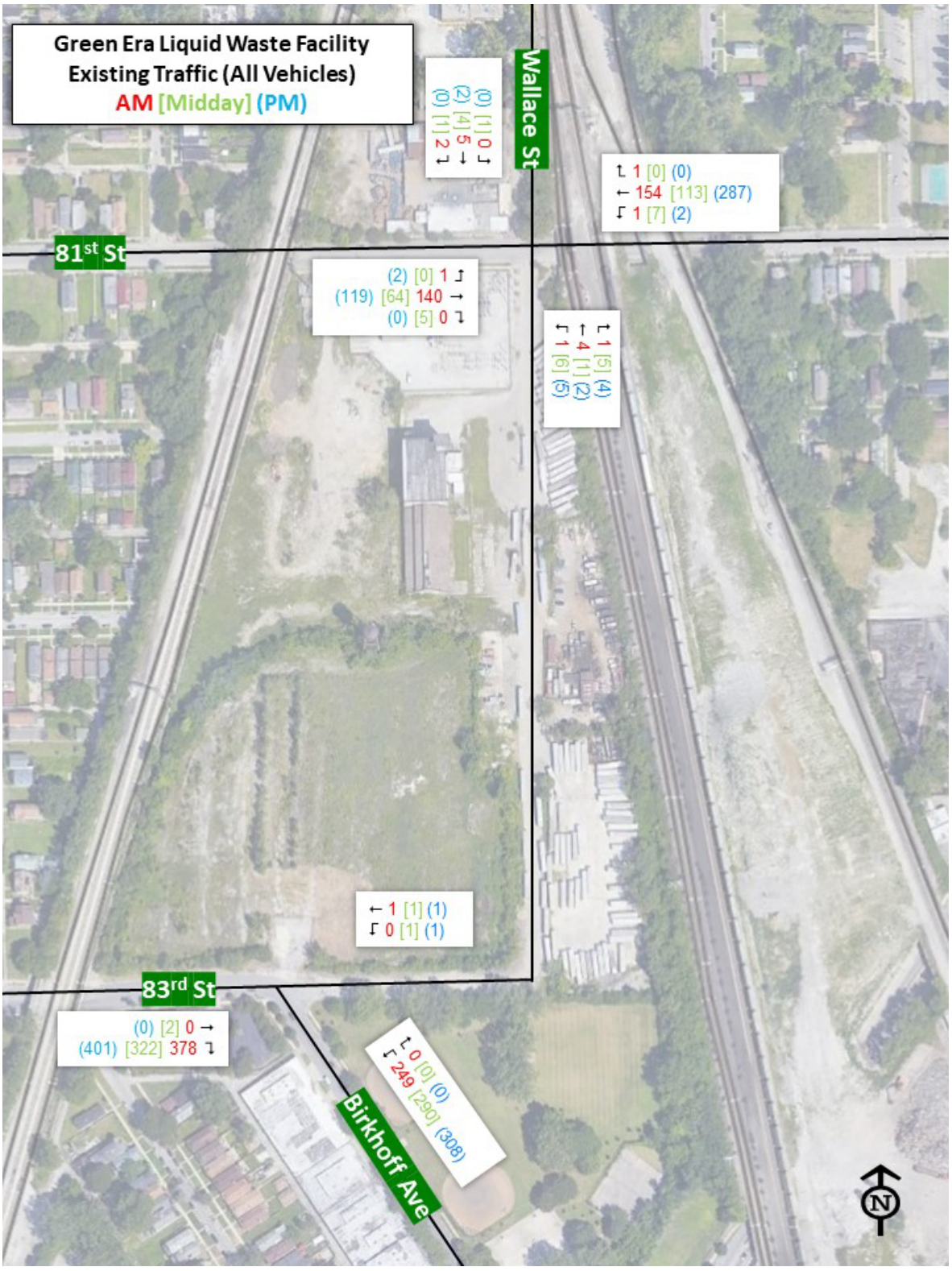


Figure 3 - Existing Peak Hour Traffic

MEMORANDUM

As shown in Figure 3, the overall peak hour traffic which is utilizing Wallace Street and the section of 83rd Street east of Birkhoff Avenue is very low. Westbound traffic at 83rd Street and Birkhoff was counted at two vehicles or less in each peak hour.

Similarly, northbound traffic on Wallace Street at 81st Street is also low with peak totals of 12 or fewer vehicles recorded northbound. Interestingly, it was noted that of these northbound vehicles and similarly for southbound vehicles there are a noticeable number of through trips along Wallace Street which was not expected prior to count collection. This could be large vehicles which have trouble with the nearby low clearances and are continuing to the termination of Wallace Street to the north at 80th Street as an access point to the area roadway network.

With the low volumes of vehicles during the peak hours, TERRA looked at the total volumes of vehicles throughout the entire 12-hour period from 6 AM to 6 PM where TERRA collected vehicle data. These totals are shown in Table 2 and Figure 4. Figure 5 shows the traffic volumes for light vehicles and Figure 6 shows the traffic volumes for trucks.

Table 2 – Total Traffic

	Southbound			Westbound			Northbound			Eastbound			
81st St & Wallace St	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt	Total
Light Vehicles	5	12	6	16	1528	3	22	3	20	4	766	13	2400
Light Vehicle %	72	46	86	49	98	75	92	14	63	80	97	77	95
Medium Vehicles	1	7	1	17	26	1	1	10	7	1	19	3	94
Medium Vehicle %	14	27	14	52	2	25	5	48	22	20	2	18	4
Articulated Trucks	1	7	0	0	1	0	1	8	5	0	6	1	32
Articulated Truck %	14	27	0	0	0.1	0	4	38	16	0	1	6	1
Total	7	26	7	33	1555	4	24	21	32	5	791	17	2526
	Southbound			Westbound			Northbound			Eastbound			
83rd St & Birkhoff	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt	Lt	Thru	Rt	Total
Light Vehicles	-	-	-	9	12	-	2645	-	1	-	7	3797	6472
Light Vehicle %	-	-	-	75	92	-	98	-	100	-	78	98	98
Medium Vehicles	-	-	-	2	1	-	53	-	0	-	2	81	139
Medium Vehicle %	-	-	-	17	8	-	2	-	0	-	22	2	2
Articulated Trucks	-	-	-	1	0	-	1	-	0	-	0	1	3
Articulated Truck %	-	-	-	8	0	-	0	-	0	-	0	0	0
Total	NA	NA	NA	12	13	-	2699	-	1	-	9	3879	6614

The total volume northbound for the 12-hour period on Wallace Street is 77 vehicles, of these 45 are light vehicles, 18 are medium size trucks which includes Single Unit trucks, dump trucks and buses and 14 are articulated trucks which means a vehicle with a cab and trailer. Most vehicles at the 81st and Wallace intersection are eastbound and westbound through traffic on 81st Street with light traffic on Wallace Street and few turns from the 81st Street to Wallace Street. This results in about 18% of the trips northbound on Wallace as large trucks and 23% as medium trucks or 41% of the volume as trucks.

At the intersection to the south, the westbound traffic has a total of 25 vehicles with traffic turning onto eastbound 83rd Street east of the intersection is 10 vehicles for a total of 35 vehicles on the east leg of 83rd Street in 12-hours of a total 6,614 vehicles through the

MEMORANDUM

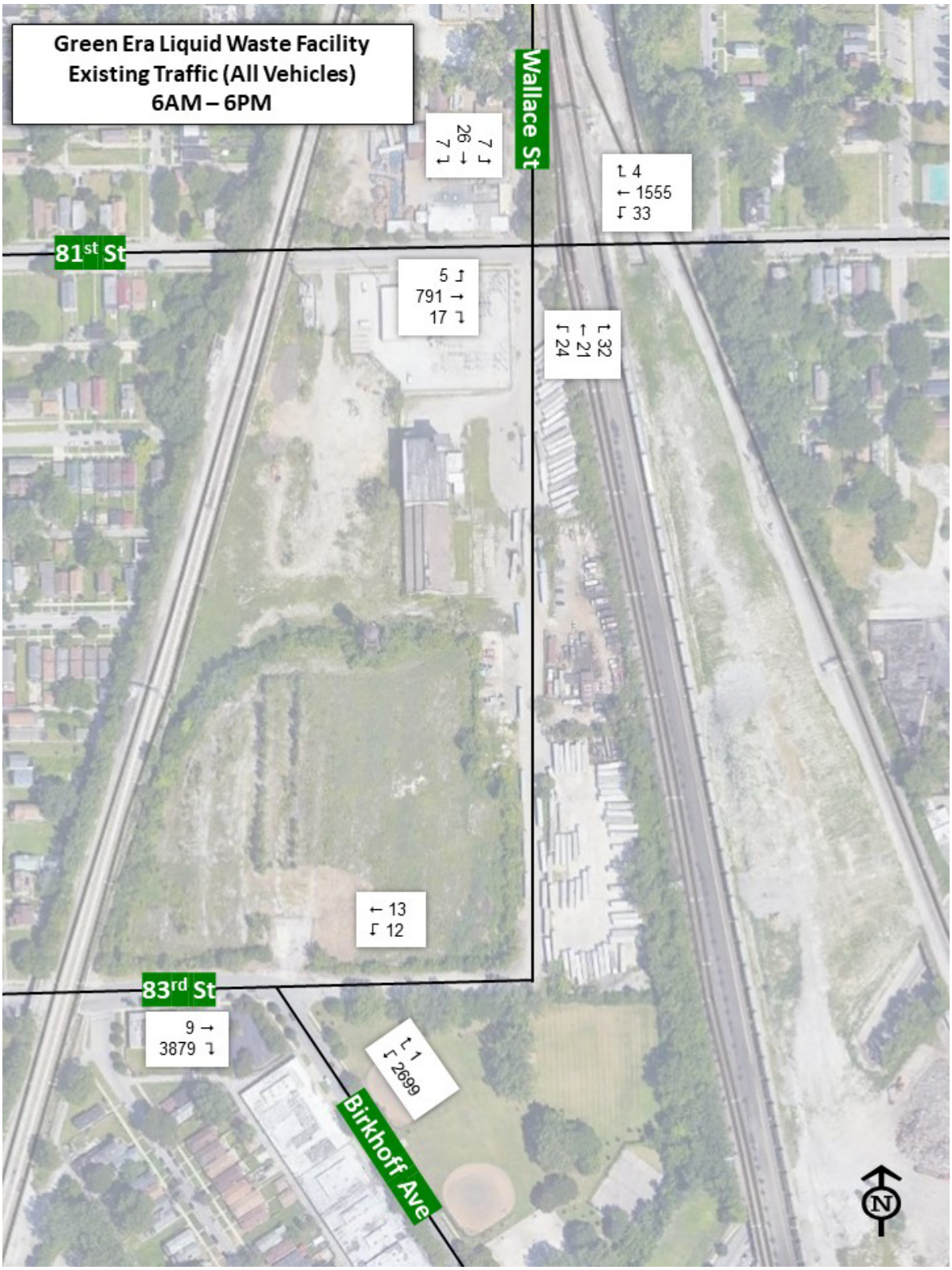


Figure 4 – 12-Hour Existing Traffic Totals

MEMORANDUM

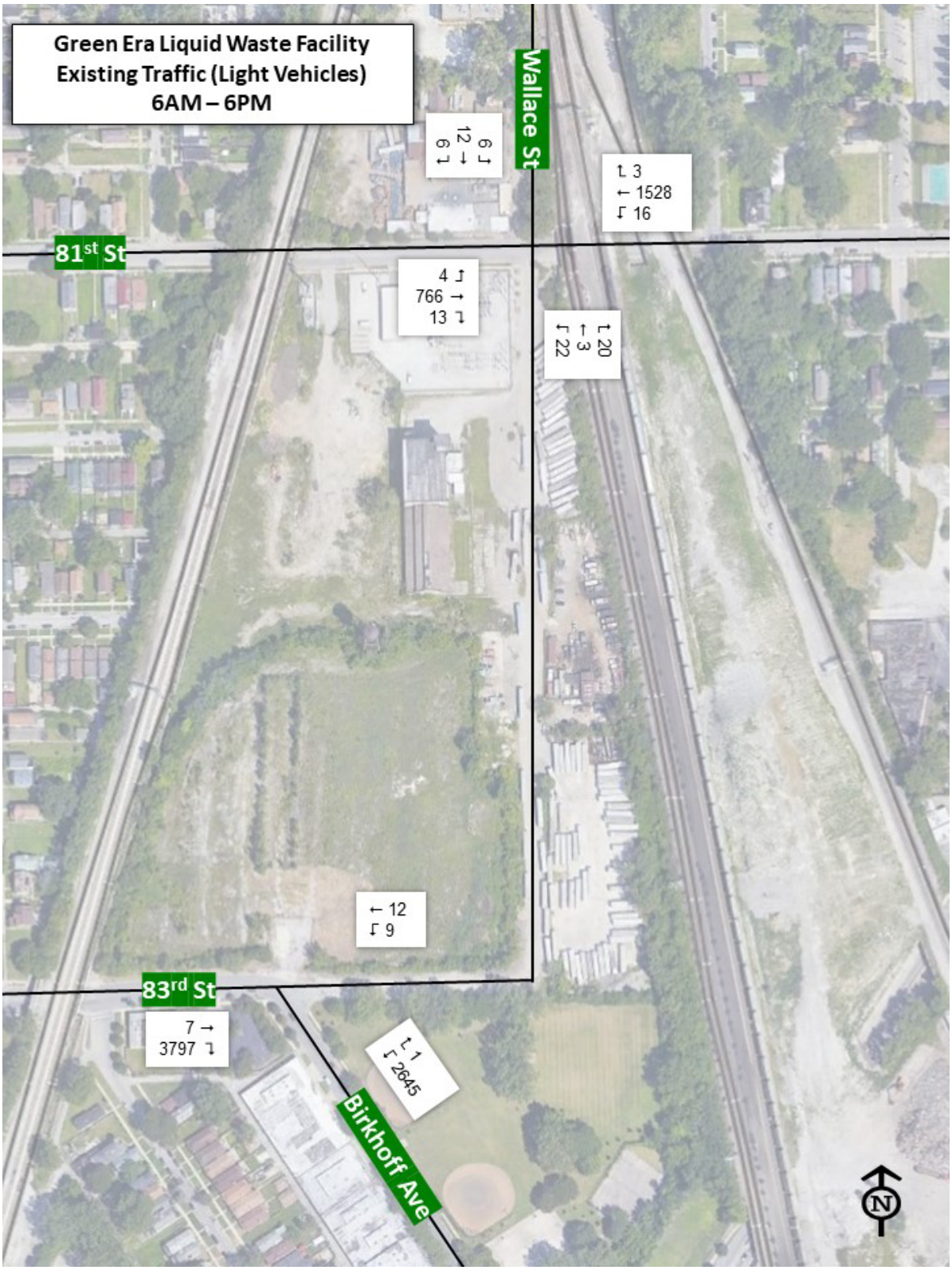


Figure 5 – 12-hour Existing Light Vehicle Traffic

MEMORANDUM

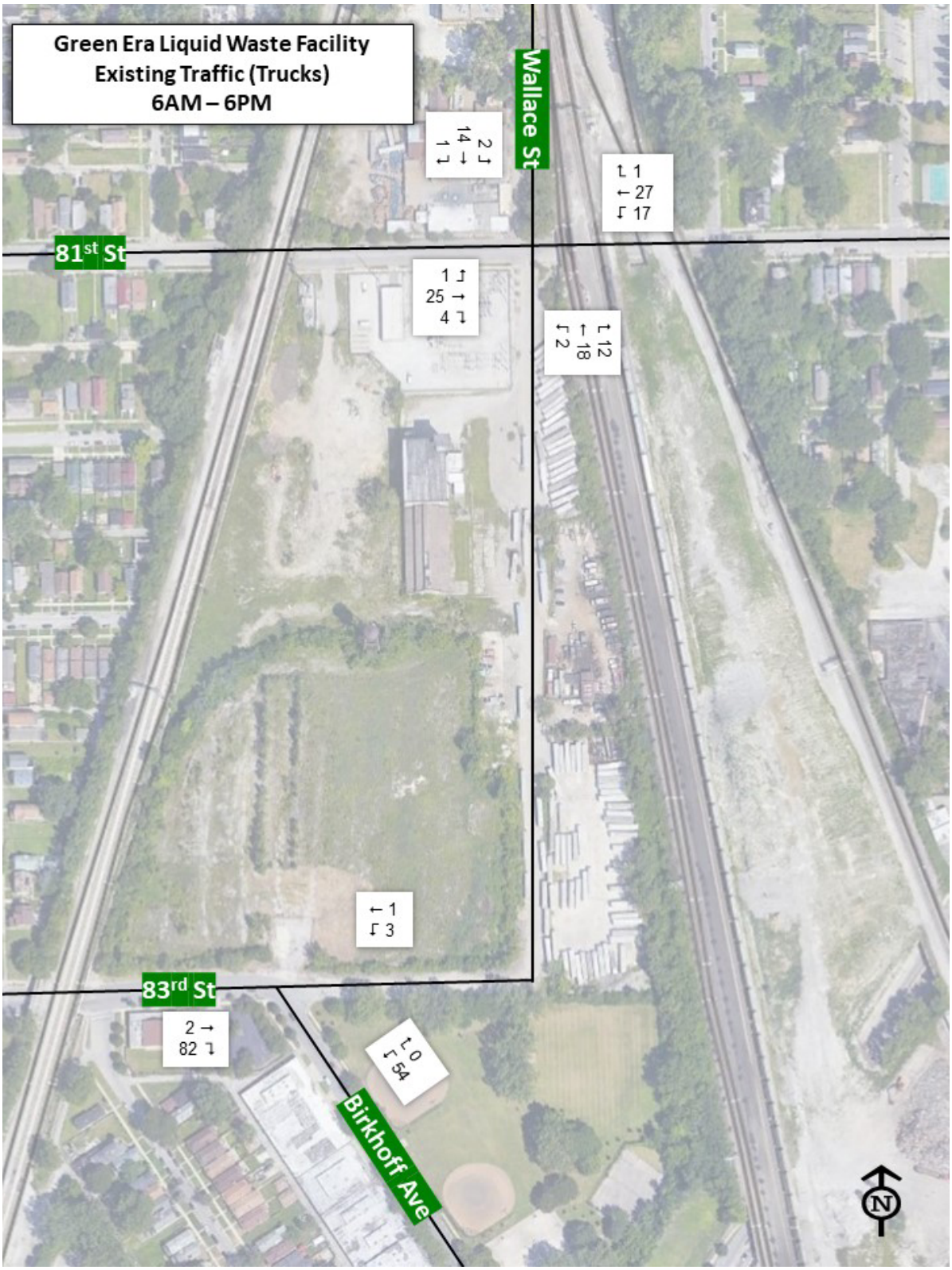


Figure 6 - 12-hour Existing Truck Traffic

MEMORANDUM

intersection. Of the 25 vehicles westbound, 21 are light vehicles, 3 medium trucks and 1 articulated truck. This is 84% passenger vehicles, 12% medium and 4% articulated trucks.

The traffic volumes were added to a traffic model for the roadways near the site to estimate the expected Level of Service (LOS) for existing traffic. The results of this analysis are summarized in Table 3.

Table 3 - Existing Traffic Analysis

	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay	v/c	LOS	Delay	v/c
81st Street & Wallace Street						
Northbound	B	12.1	0.01	B	13.5	0.04
Eastbound Left	A	7.5	0.01	A	8.5	0.01
Westbound Left	A	8.6	0.01	A	8.6	0.01
Southbound	B	11.3	0.01	B	14.6	0.01
83rd Street & Birkhoff Avenue						
Westbound	A	9.7	0.01	A	9.7	0.01

Site-Generated Trips

When evaluating proposed traffic at a new development, it is necessary to estimate the number of new vehicle trips which will be created by the new uses at the site. TERRA was given information about staff, volunteers, shift changes, and estimated truck schedules for the plant.

Based on the information provided to TERRA, during the morning hours, the first shift staff arrives between 5:30 AM and 6:00 AM and prior shift employees would leave about 30 minutes later between 6:30 AM and 7:00 AM. This makes the estimated peak hour of traffic in the morning between 6:00-7:00 AM. The information suggests that during the morning peak, additional truck traffic includes an estimated four (4) loads of pumpable food waste and two (2) loads of separated waste. One (1) compactor load of trash may be removed from the facility and one (1) load of cake solids leaves the facility in the morning. Additional traffic could include two (2) soil amendment trucks will arrive throughout the day, so as a worst case scenario, one (1) was assigned to arrive during the morning peak hour. Eight (8) staff are estimated to arrive in the morning, along with four (4) volunteers, and one (1) staff member from the third shift would be expected to leave.

Based on the information, TERRA estimated that nine (9) trucks of various load types and 12 passenger vehicles from employee shift changes and volunteers would enter the facility during the AM peak hour of traffic. TERRA assumed (1) employee vehicle would exit during this hour, and for a conservative estimate, the nine (9) trucks entering during this hour would also leave during the same hour.

225 WEST OHIO STREET 4TH FLOOR CHICAGO, ILLINOIS 60654 (T) 312.467.0123 WWW.TERRAENGINEERING.COM
CHICAGO PEORIA OAK PARK SAINT LOUIS MILWAUKEE GRAYSLAKE

During the afternoon hours, an estimated four (4) trucks of pumpable food waste are received, and two (2) loads of separated waste. One (1) compactor load of trash may be removed from the facility. A shift change would likely not coincide with the peak hour of traffic on the nearby streets, but four (4) volunteers may enter the facility at this time.

For the PM peak hour of traffic, TERRA estimated seven (7) trucks and four (4) passenger vehicles driven by volunteers would enter the facility during the hour. Because a shift change does not occur during this time no passenger vehicles would be expected to enter or exit the facility, however one (1) vehicle will be added to the model to show driveway performance. TERRA also assumes the seven (7) trucks entering the facility during the hour also exit the facility within the same PM peak hour.

The trips during the midday peak hour of traffic were not evaluated since based on the expected usage provided by the client the traffic volumes at both intersections would be lower during the midday peak than the AM and PM peak hours of traffic.

Trip Assignments

Trips from passenger vehicles and trucks were considered separately for this site as the truck loading areas and the parking location for staff, volunteers and visitors are located separately within the site. For passenger vehicles, TERRA assumed the vehicles that regularly enter the facility would avoid the deteriorating road on Wallace Street and would instead enter the site from the south via the 83rd Street at Birkhoff Avenue intersection.

During the AM peak hour of traffic in the existing condition, 40% of vehicles traveled northbound / westbound on Birkhoff Avenue and the remaining 60% were traveling eastbound on 83rd Street. Based on this, TERRA assigned 40% of entering vehicles from Birkhoff Avenue. Similar calculations were done for trips during the PM peak hour of traffic resulting in 43% on the vehicles being assigned to northwest bound Birkhoff Avenue and the remaining 57% approaching on eastbound 83rd Street.

For trucks, TERRA assumed trucks would be taller than the clearance height of the bridges on 81st Street to the east of Wallace Street and on 83rd Street west of the site. TERRA also assumed trucks would be most likely to turn onto Wallace Street from 81st Street instead of traversing from Wallace Street north of 81st Street, which is narrow. Based on this assumption, 100% of truck traffic which was assigned to the north entrance was assigned to enter from the west via 81st Street to right onto Wallace Street and all exiting traffic was directed north on Wallace to make a left turn onto 81st Street.

Figure 7 shows the trip assignment map which represents possible passenger vehicle traffic generated by the development. Figure 8 shows the trip assignment map which represents possible truck traffic generated by the development.

Within the site, the trucks are expected to use the north entrance to the site From Wallace Street. Information was provided to TERRA from the “Green Era Sustainability, LLC, Engineering Report, Basis of Design Doc. No. MP-02, Dated October 4, 2021” which details the expected truck arrivals and departures as well as the expected loading and unloading locations and procedures. These procedures are described as follows:

TERRA ENGINEERING LTD.

MEMORANDUM

TRUCK TRAFFIC PATTERNS AND QUEUING

All trucks will enter the facility from South Wallace Street through a gated entrance. The gate will be open during daytime hours.

Trucks delivering non-pumpable waste in a dump trailer or roll-off container will back through one of the solids receiving bay doors to a curbed stop at the tipping wall. The concrete floor will be striped with yellow lane markings to assist drivers with alignment. If the solids bay is occupied, additional trucks will need to park outside of the building in the designated area.

Trucks delivering pumpable food waste or F.O.G. can pull into the building through the north overhead door, closest to the digester tank.

Vans delivering palletized products will back to the loading dock at the north end of the building.

After tipping, trucks that delivered non-pumpable waste will exit the bay doors and turn left and will exit at Wallace.

Liquid tankers will pull through the building and turn to the right and proceed around the tanks to the Wallace Street exit.

Trucks delivering to the facility will have a manifest with verifiable load weights or volumes with the generator(s) listed and the collection date.

All trucks will exit the facility at South Wallace Street.

This explanation from the facility confirms that all truck traffic should be assigned to the Wallace Street access point to the site. The description also implies that the trucks will be loaded and unloaded in different locations based upon the types of materials being hauled. The implied result is that there should be little to no queuing of the trucks and that any queuing required would occur within the site. Should the need arise for a truck to be queued outside of the gates to the site, it appears there is over 700 feet of storage between the driveway along Wallace Street and the intersection with W 81st Street to the north which should provide adequate storage on a mostly unused roadway segment which would not affect traffic flows.

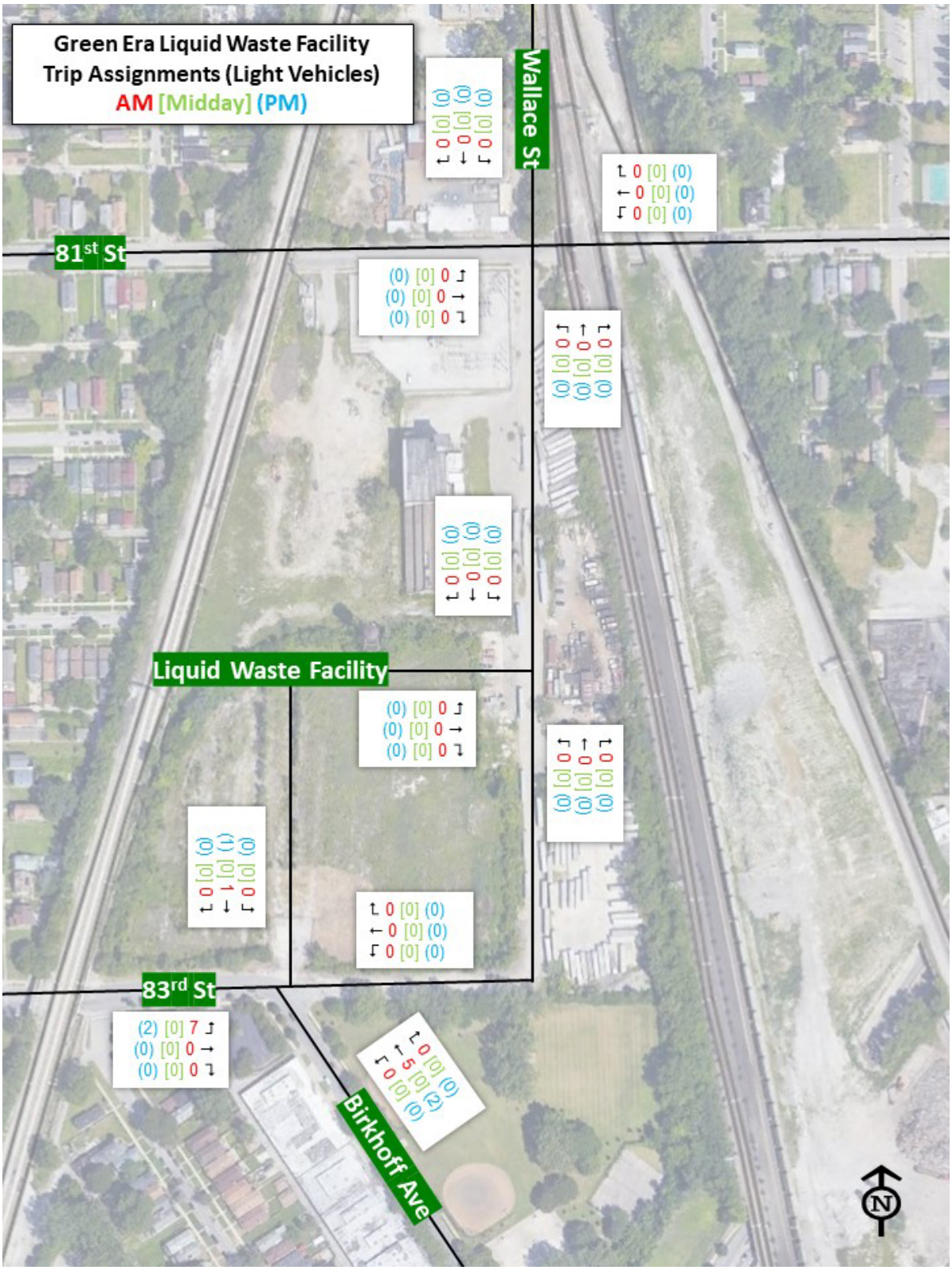


Figure 7 – Site-generated Trip Assignments (light vehicles)

MEMORANDUM

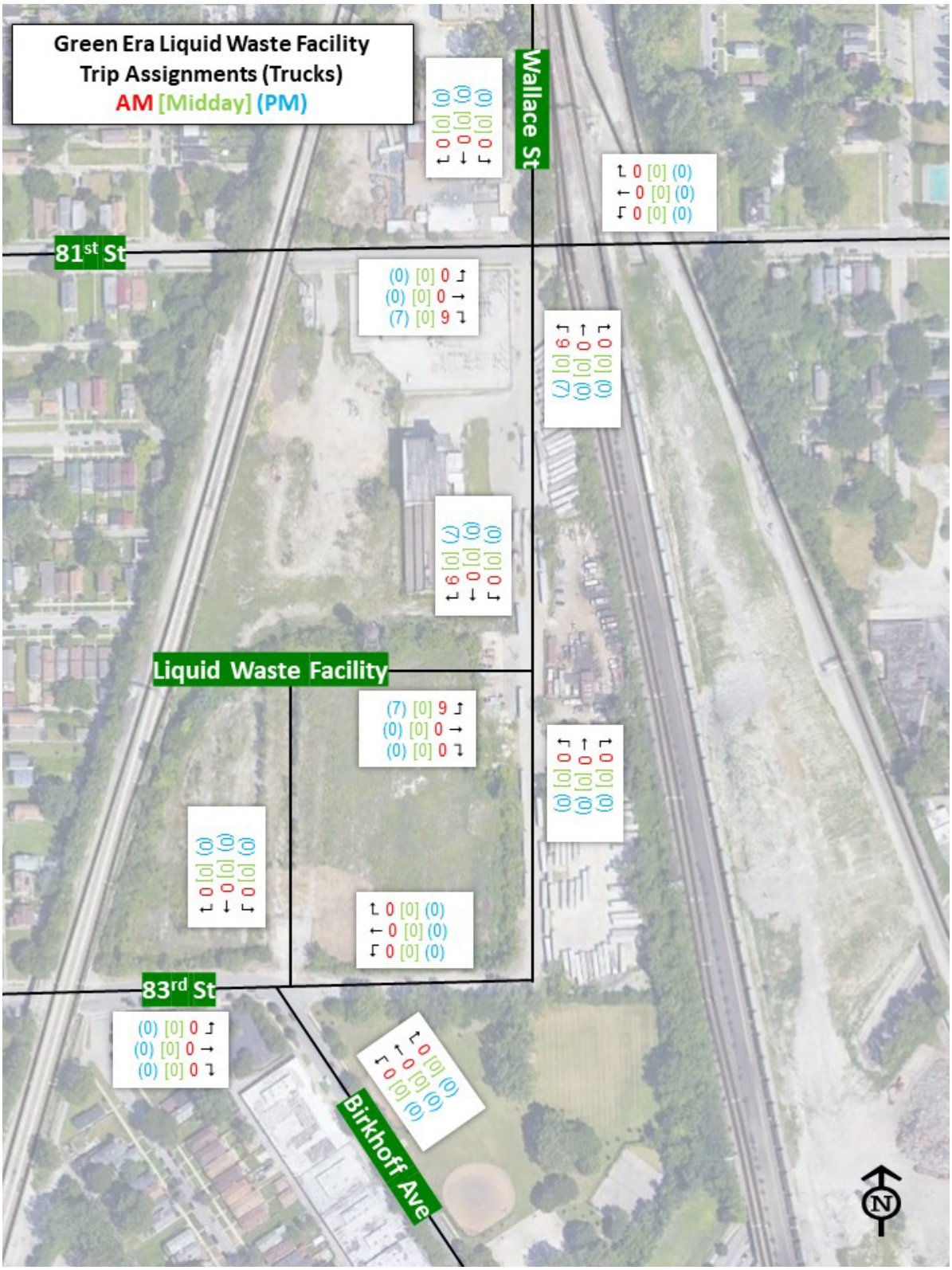


Figure 8 – Site-generated Trip Assignments (trucks)

MEMORANDUM

Opening Day

The newly generated trips from the Trip Assignments section were then added to the existing volumes to develop "Opening Day" traffic volumes which are shown in Figure 9. The opening day traffic model represents traffic around the study area with the plant in operation.

The opening day traffic volumes were inserted into the Synchro traffic modeling software and compared with the existing traffic model to determine if there were any significant changes to the traffic delay or LOS levels at the study intersections around the Green Era site. The modeled traffic performance of the intersection network for opening day is shown in Table 4.

Table 4 – Opening Day Traffic Analysis

	Weekday AM Peak			Weekday PM Peak		
	LOS	Delay	v/c	LOS	Delay	v/c
81st Street & Wallace Street						
Northbound	B	12.7	0.03	B	13.0	0.04
Eastbound Left	A	7.5	0.01	A	8.5	0.01
Westbound Left	A	8.6	0.01	A	8.6	0.01
Southbound	B	11.4	0.01	B	14.6	0.01
Wallace St & Green Era Plant						
Eastbound Left	A	9.6	0.01	A	9.6	0.01
83rd St & Birkhoff/Green Era						
Eastbound Left	A	7.8	0.01	A	7.9	0.01
Westbound	A	9.7	0.01	B	12.4	0.01
Southbound	B	13.9	0.01	B	14.8	0.03

Comparing the existing model with the opening day model, there are two new intersections created by the driveways to the site which do not exist in the existing scenario. Both new intersections operate well with little to no delay which is to be expected with the low traffic volumes entering and exiting the site and the low traffic volumes on the adjacent streets.

At the two existing intersections where traffic is added from the facility to the existing network, there are slight increases in delay of under one (1) second of average delay per vehicle for the northbound traffic at Wallace Street at 81st in both the AM and PM Peaks. The traffic flows for eastbound and westbound 81st Street see no change and the southbound traffic on Wallace sees almost no impact due to the increased northbound trucks.

For the 83rd Street and Birkhoff Avenue intersection the new driveway to the site creates a 4th leg of the intersection which is stop controlled. With very few cars leaving during the AM peak period, the LOS and delay remain the same for westbound traffic. The new north leg adds southbound traffic in the stop-controlled driveway which operates at LOS B with a delay of under 15 seconds in both the AM and PM peaks.

The traffic operations on the streets adjacent to the liquid waste facility are not significantly changed.

225 WEST OHIO STREET 4TH FLOOR CHICAGO, ILLINOIS 60654 (T) 312.467.0123 WWW.TERRAENGINEERING.COM
CHICAGO PEORIA OAK PARK SAINT LOUIS MILWAUKEE GRAYSLAKE

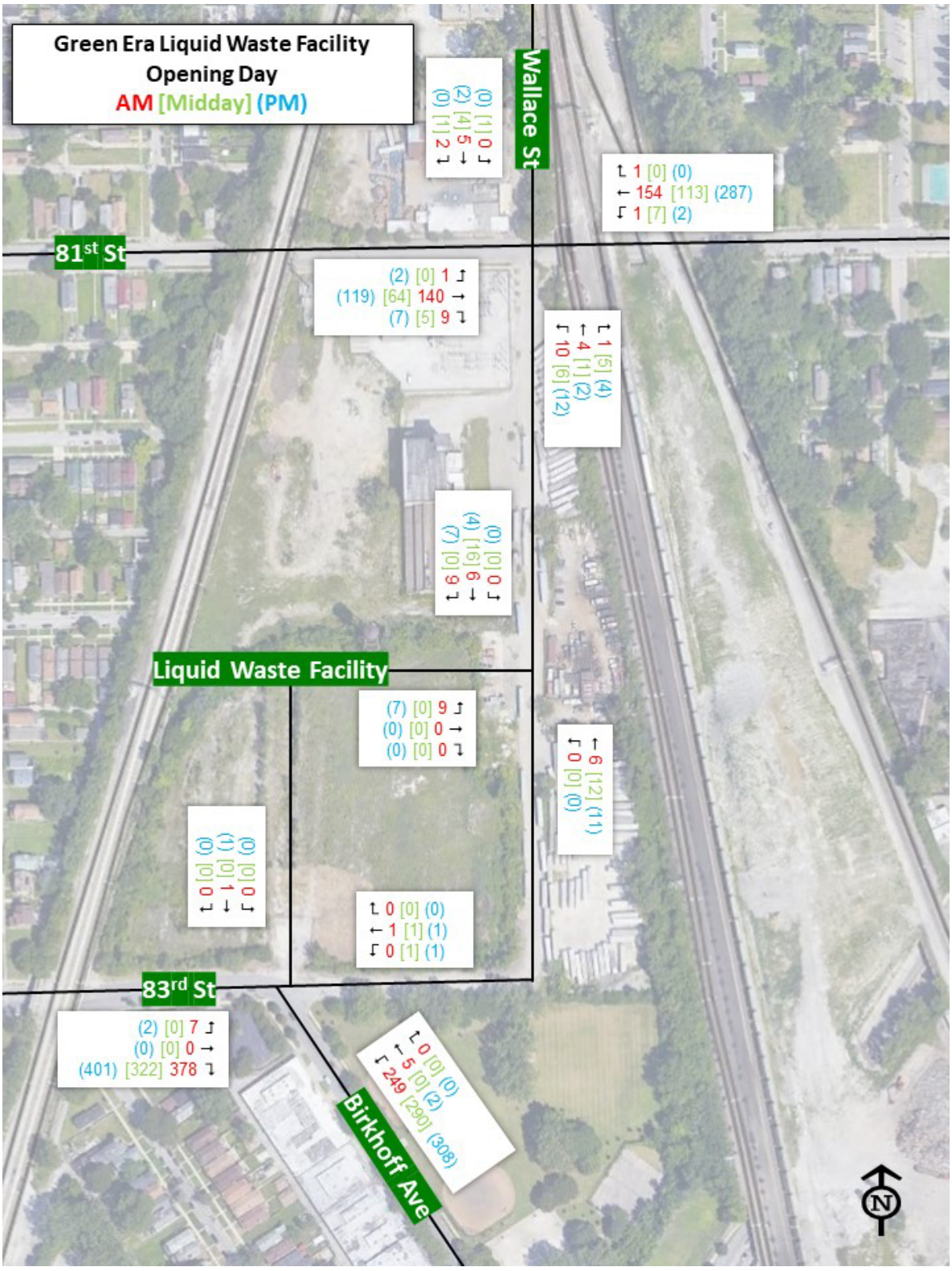


Figure 9 - Opening Day Traffic

MEMORANDUM

TERRA ENGINEERING LTD.

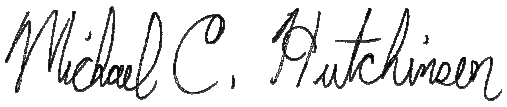
Conclusions

Based on a review of the existing traffic data, estimated development trips, and other data it appears that the facility will not have a significant impact on the adjacent street network. The proposed facility is located on a low volume street in a mostly industrial area between two sets of rail tracks.

The Wallace Street and 83rd Street segments which are adjacent to the Green Era site have very low traffic volumes and the additional trips added from the site will not significantly impact these streets. Looking at how the additional trips impact the performance of the adjacent intersections, the low additional volumes created by the site have little impact on the intersection performance with all intersections operating at Level of Service (LOS) B or better. As these vehicles disperse throughout the roadway network further from the site the impacts will become less at each subsequent intersection that they pass through.

It is TERRA's opinion that the traffic generated by the site will not impact the intended Level of Service (LOS) of the public roadways and that no additional measures are necessary to mitigate traffic impacts.

Sincerely,



Michael C. (Chris) Hutchinson, P.E., PTOE
Senior Traffic Engineer
(314) 614-2410
chutchinson@terraengineering.com

MEMORANDUM

ATTACHMENT 6
ENVIRONMENTAL REPORTS-VARIOUS

Phase I Environmental Site Assessment

650 West 83rd Street Phase I ESA
650 West 83rd Street
Chicago, Cook County, Illinois
March 10, 2020

Terracon Project No.: 11207060

Prepared for:

Green Era Educational NFP
Chicago, Illinois

Prepared by:

Terracon Consultants, Inc.
Chicago, Illinois

March 10, 2020

Terracon

Mr. Jason Feldman
Green Era Educational NFP
218 North Jefferson Street, Suite 300
Chicago, Illinois 60661-1307

Phone: (312) 544-9218
Email: jason@greenerapartners.com

Re: Phase I Environmental Site Assessment
650 West 83rd Street
Chicago, Cook County, Illinois
Terracon Project #: 11207060

Dear Mr. Feldman:

Terracon Consultants, Inc. (Terracon) is pleased to submit the enclosed Phase I Environmental Site Assessment (ESA) report for the above-referenced site. This assessment was performed in accordance with Terracon Proposal No. P11207060 dated February 14, 2020.

Terracon appreciates the opportunity to perform these services for you. Please contact us if you have questions regarding this information or if we can provide any other services.

Sincerely,
Terracon Consultants, Inc.

Christopher J. Heynen
Staff Scientist

Rachelle K. Christian
Department Manager

Richard M. O'Brien, PE
Senior Project Manager

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

EXHIBITS

APPENDICES

COMMON ACRONYMS

ACM..... Asbestos-containing material
AST..... Aboveground storage tank
ASTM..... ASTM International
AUL..... Activity and use limitation
BGS ..... Below ground surface
BTEX ..... Benzene, toluene, ethylbenzene, and xylenes
CERCLA ..... Comprehensive Environmental Response, Compensation, and Liability Act
CFR ..... Code of Federal Regulations
DOT ..... United States Department of Transportation
EPA..... United States Environmental Protection Agency
HREC..... Historical recognized environmental condition
LUST..... Leaking underground storage tank
MCL ..... Maximum contaminant level
MSDS..... Material safety data sheet
NGVD..... National Geodetic Vertical Datum
NOV ..... Notice of violation
NPL..... National Priority List
NRCS..... USDA Natural Resource Conservation Service
OSHA..... Occupational Safety and Health Administration
PCB ..... Poly-chlorinated biphenyl
RCRA..... Resource Conservation and Recovery Act
REC ..... Recognized environmental condition
SPCC..... Spill Prevention, Control and Countermeasure
SWPPP..... Stormwater pollution prevention plan
TEPH ..... Total extractable petroleum hydrocarbons
TPH..... Total petroleum hydrocarbons
TVPH ..... Total volatile petroleum hydrocarbons
TRI..... Toxic release inventory
TSCA ..... Toxic Substances Control Act
USGS..... United States Geological Survey
UST..... Underground storage tank
VCP ..... Voluntary cleanup program
VOC..... Volatile organic compound

Units of measure

sq ft or ft^2..... square feet
mg/kg ..... milligrams per kilogram
mg/l..... milligrams per liter
ug/l..... micrograms per liter
ppb..... parts per billion
ppm……..parts per million

PHASE I ENVIRONMENTAL SITE ASSESSMENT
650 WEST 83RD STREET
CHICAGO, COOK COUNTY, ILLINOIS

Terracon Project #: 11207060

EXECUTIVE SUMMARY

This Phase I Environmental Site Assessment (ESA) was performed in accordance with Terracon Proposal No. P11207060 dated February 14, 2020 and was conducted consistent with the procedures included in ASTM International (ASTM) E1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. This Phase I ESA was conducted under the supervision or responsible charge of Rachelle K. Christian and Richard M. O'Brien, P.E., Environmental Professionals. Christopher J. Heynen performed the site reconnaissance on March 3, 2020.

A cursory summary of findings is provided below. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein.

- The site consists of an approximate 9-acre parcel of vacant land located at the northwest corner of South Wallace Street and West 83rd Street in Chicago, Cook County, Illinois (Cook County Permanent Index Numbers [PINs]: 20-33-119-024, 20-33-124-001, and 20-33-124-002).
- The site consisted of undeveloped land in 1897 and unspecified "stock storage" and lumber storage associated with the International Harvester Company from approximately 1910 through 1924. Three 12,000-gallon underground storage tanks (USTs) containing benzene and linseed oil were identified adjacent to a paint storage structure on the northwest corner of the site. USTs were identified in the 1910 and 1924 Sanborn maps and the paint storage structure was identified through 1975. The site was developed with an impounded automotive storage yard from at least 1962 through 2009. The northeast corner of the site was developed with a warehouse structure from 1910 through at least 1964. The on-site structures were demolished by 1988 and the site has remained vacant land since that time.

  On-site recognized environmental conditions (RECs[1]) identified during the historical document review include the following:

[1] Recognized Environmental Conditions (RECs) are de fined by ASTM E1527-13 as "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not recognized environmental conditions.

- Potential for wood preservative (such as coal tar/creosote) application and storage to have caused releases in association with lumber stockpiles and rail spurs on site;
- Potential lead-based paint releases from paint storage structure as storage took place on site for at least sixty-five years;
- The potential presence of unknown USTs on the site based on historical industrial operations; and,
- The potential for releases of petroleum products from impounded automobiles stored on site from at least 1962 through 2009.

- Currently, the site is bordered to the north by vacant structures located at 601 West 81st Street; to the east by South Wallace Street followed by 8149 South Wallace Street (Diamond Waste & Recycling) and truck trailer parking; to the south by West 83rd Street, a community park, Self Storage, Inc. (8316 South Birkhoff Avenue), and Look Up and Live Full Gospel Ministries (661 West 83rd Street); and, to the west by a Metra elevated rail line. Industrial and fuel storage facilities of various types have been located to the north, east and south of the site in various forms from at least 1897 through the present, and their potential impact to the site represents a REC to the site. Regulatory records are further discussed below.

- Fly dumping was observed at the site, which included crushed concrete and stone located on the northwest portion of the site, mulch located on the southeast portion of the site, as well as dirt, gravel, concrete, and shredded plastic located on the northeast portion of the site, on the exterior of the locked enclosure. Numerous solid waste and recycling dumpsters were also observed in the northeast portion of the site, on the exterior of the locked enclosure.

- A 2013 Phase I ESA conducted by Terracon identified potential releases (associated with former on-site lumber stockpiles, paint storage, impounded automobiles, SPILLS listing, and miscellaneous dumped materials), the presence and potential releases associated with three 12,000-gallon benzene and linseed oil USTs, potential presence of unknown USTs, and the potential for impacts from north, east, and south adjoining properties as RECs to the site.

- Terracon conducted Phase II ESA work in June 2013, including the advancement of 37 soil borings, three of which were converted to groundwater monitoring wells. Follow-up work was conducted in September and October of 2013, with advancement of 53 additional borings, with one converted to a groundwater monitoring well and four used for soil gas sampling. The combined Phase II ESA report dated October 28, 2013 identified hazardous concentrations of lead in soil in three locations, and polynuclear aromatic hydrocarbons (PNAs) exceeding the default attenuation capacity of soil in the

northwestern portion of the site. Additionally, volatile organic compounds (VOCs), PNAs, and inorganics were detected above Tier I Soil Remediation Objectives (SROs). Groundwater samples collected detected lead, manganese, and iron above Tier I Groundwater Remediation Objectives (GROs) for Class I Groundwater. Soil gas samples detected naphthalene above Soil Gas Remediation Objectives for residential properties.

- A May 2015 Phase I ESA conducted by Terracon identified the following RECs in connection with the site: areas with hazardous lead, attenuation, VOC, and inorganic impacts to the site's soil, groundwater, and/or soil gas; potential for wood preservative (such as coal tar/creosote) application and storage to have caused releases in association with lumber stockpiles and rail spurs on site; potential lead-based paint releases from paint storage structure as storage took place on site for at least sixty-five years; the potential presence of unknown USTs on the site based on historical industrial operations; the potential for releases of petroleum products from impounded automobiles stored on site from at least 1962 through 2009; SPILLS No. NL860889 based on the unknown content, extent, and location of the release; and, impacted urban fill was verified to be on-site during 2013 and 2015 subsurface investigations. A November 2015 Phase I ESA Update conducted by Terracon identified the following additional REC in connection with the site: the active SRP listing based on the absence of a NFR determination to date.

- Terracon completed a Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan (CSIR/ROR/RAP) for the site in May 2015. The purpose of the report was to identify RECs and related contaminants of concern (COCs). The report included the following three parts:

    - Site Investigation, which consisted of the previous environmental and subsurface investigations, as well as a 2015 investigation to delineate the extent of attenuation and hazardous waste lead exceedances. PNA concentrations in three samples exceeded the attenuation capacity for subsurface soil; lead concentrations in four samples analyzed with TCLP exceeded hazardous waste criteria; and chemical impacts to groundwater include lead, aluminum, iron, manganese, and thallium above GROs for Class I groundwater ingestion exposure route.

    - Remediation Objectives consisted of comparing analytical results of samples collected to their appropriate remedial objectives.

    - Remedial Action Plan (RAP) to satisfy remedial requirements in accordance with the Tiered Approach to Corrective Action Objectives (TACO). The RAP indicated that remedial actions would include in-situ chemical treatment, remedial excavation, engineered barriers, and, use of the City of Chicago groundwater ordinance and off-site notifications.

- The Illinois Environmental Protection Agency (IEPA) approved the CSIR/ROR/RAP report in a letter dated August 20, 2015.

- Terracon submitted a Remedial Action Plan Addendum for IEPA review on January 21, 2020. The RAP Addendum provided supplemental soil data results, updated the new site owner's development plans, proposed the use of an alternative engineered barrier and new Tier 2 RO, and provided responses to IEPA's comments. Exhibits, including a detailed Soil Management Zone, were included. The RAP Addendum proposed to revise the engineered barrier previously proposed for affected landscaped areas from 3 feet of soil to a geotextile and 18 inches of clean soil. The geotextile proposed was US 100NW-HVO Warning Barrier, manufactured by US Fabrics, Inc., or a comparable geotextile product.

- The IEPA Conditionally approved the RAP Addendum in a letter dated March 2, 2020. IEPA requested that the exact geotextile planned to be utilized on site be submitted for review prior to installation

- The site (addressed as 650 West 83rd Street) was identified as a Chicago ENV, SPILLS, and Site Remediation Program (SRP) facility in the regulatory database report. The site was identified as a Chicago ENV facility due to on-site inspections. The listing did not contain additional information. A release of unknown content and extent was reported to the Office of Emergency Response, which assigned SPILLS No. NL860889 to the release. The IEPA received notification of the SPILLS incident on August 14, 1986. Additional information was not available for the listing. The site was enrolled into the SRP on February 9, 2015 by Terracon. The site is actively undergoing remediation through the SRP and to date, a No Further Remediation (NFR) letter has not been issued for the listing. Based on the unknown content, extent, and location of the release, SPILLS No. NL860889 constitutes a REC to the site.
- The following former facilities listed in the environmental database report were identified as RECs to the site:

  - Small Business Admin. (east adjacent 8201 South Wallace Street) was identified as a leaking underground storage tank (LUST) facility, located on the east adjacent property across South Wallace Street. A "non-petroleum fuel oil" release was reported to the Illinois Emergency Management Agency (IEMA) on November 7, 1991 and assigned LUST No. 913213. Investigation or remediation reports were not identified on the IEPA LUST Incident Tracker. A NFR determination for the incident was issued on January 26, 2010 with no engineering or institutional requirements. Based on the absence of documented remediation activities and close proximity to the site, LUST No. 913213 constitutes a REC to the site.

  - 8201 South Wallace Street was not identified as a UST facility in the regulatory database report or on the Office of the State Fire Marshal (OSFM) online UST database; however, UST records identified on the City of Chicago's Data Portal indicated the facility contained a 6,000-gallon toluene UST and a 6,000-gallon methyl ethyl ketone UST installed in 1962; a 4,000-gallon UST with unreported installation date; a 1,000-gallon fuel oil UST installed in 1953; and five 12,000-gallon fuel oil USTs installed in 1952. Dates of removal were not reported. The USTs were not registered with the OSFM. Based on the unknown status (i.e. removed, still in use, abandoned in place, etc.) and close proximity to the site, the USTs constitute a REC to the site.

- Urban fill in the City of Chicago typically contains elevated concentrations of PNAs and metals. Based on the historical development of the site and subsurface investigations, urban fill is present on-site and constitutes a REC.

FINDINGS AND CONCLUSIONS

Terracon has performed this Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527-13 of 650 West 83rd Street, Chicago, Illinois, the site. Any exceptions to, or deletions from, this practice are described in Section 1.4 – Limitations and Exceptions of this report.

This assessment revealed evidence of the following on-site RECs:

- Identified areas with hazardous lead, attenuation, VOC, and inorganic impacts to the site's soil, groundwater, and/or soil gas;
- Potential for wood preservative (such as coal tar/creosote) application and storage to have caused releases in association with lumber stockpiles and rail spurs on site;
- Potential lead-based paint releases from paint storage structure as storage took place on site for at least sixty-five years;
- The potential presence of unknown USTs on the site based on historical industrial operations;
- The potential for releases of petroleum products from impounded automobiles stored on site from at least 1962 through 2009;
- SPILLS No. NL860889 based on the unknown content, extent, and location of the release;
- Impacted urban fill was verified to be on-site during 2013 and 2015 subsurface investigations; and,
- The active SRP listing based on the absence of a NFR determination to date.

This assessment revealed evidence of the following off-site RECs:

- LUST No. 913213 (associated with east adjacent 8201 South Wallace Street) based on the absence of documented remediation activities and close proximity to the site; and,

- The USTs reportedly registered to 8201 South Wallace Street based on unknown status and close proximity to the site.

Investigations conducted to date have adequately characterized the site, and proposed remedial actions will address the impacts identified, as verified by IEPA approval of the 2015 Comprehensive Site Investigation, Remedial Objectives Report, and Remedial Action Plan, as well as the follow-up 2020 Remedial Action Plan Addendum. Terracon recommends that the site continue with its active remediation through the IEPA's voluntary cleanup program, the SRP, to obtain an NFR determination. Once the exact geotextile planned to be utilized on site is selected, the requested information regarding product should be submitted for IEPA review prior to installation. Terracon further recommends that the site soil and groundwater be properly managed and/or disposed of during any future redevelopment activities.

PHASE I ENVIRONMENTAL SITE ASSESSMENT
650 WEST 83RD STREET
CHICAGO, COOK COUNTY, ILLINOIS

Terracon Project #: 11207060

1.0 INTRODUCTION

1.1 Project Overview

This Phase I Environmental Site Assessment (ESA) was performed in accordance with Terracon Proposal No. P11207060 dated February 14, 2020, and was conducted consistent with the procedures included in ASTM International (ASTM) E1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. The purpose of this ESA was to assist the client in developing information to identify potential impacts, their extent, and determine if remediation is necessary prior to the redevelopment of the site. This purpose was undertaken through user-provided information, a regulatory database review, historical and physical records review, and interviews (when available), including local government inquiries, as applicable, user-provided information, and a visual noninvasive reconnaissance of the site and adjoining properties. Limitations, ASTM deviations, and significant gaps (if identified) are evident from reviewing the applicable scope of services and the report text.

1.2 Site Description

Site Location/Address	650 West 83rd Street, Chicago, Cook County, Illinois
Land Area	Approximately 9-acres
Site Improvements	The site appeared as vacant land
Site Use	Vacant land
PIN Numbers[2]	20-33-119-024, 20-33-124-001, 20-33-124-002
Adjoining North	Vacant structures (601 West 81st Street).
Adjoining South	East-west oriented West 83rd Street followed by (from east to west) Look Up and Live Full Gospel Ministries (661 West 83rd Street) and a municipal park.
Adjoining East	North-south oriented South Wallace Street followed by Diamond Waste and Recycling (8149 South Wallace Street), and a truck trailer storage yard.
Adjoining West	Southwest-northeast oriented railroad berm (Metra commuter rail line).

[2] Permanent Index Numbers (PINs)

The site location is depicted on Exhibit 1, which was reproduced from a portion of the United States Geologic Survey (USGS) 7.5-minute series topographic map (Blue Island, Illinois Quadrangle). A Site Diagram of the site and adjoining properties is included as Exhibit 2.

1.3 Scope of Work

The following scope of work was performed in accordance with Terracon Proposal No. P11207060 dated February 14, 2020:

- Tasks undertaken: field reconnaissance, freedom of information act (FOIA) requests (City of Chicago and state departments), regulatory database search, historical data review (topographic maps, aerial photographs, city directories, and Sanborn Maps).
- Tasks NOT undertaken: a chain-of-title and lien search were not conducted.

1.4 Limitations and Exceptions

Based upon the agreed-on scope of services, this ESA did not include subsurface or other invasive assessments, business environmental risk evaluations, or other services not particularly identified and discussed herein. Reasonable attempts were made to obtain information within the scope and time constraints set forth by the client; however, in some instances, information requested is not, or was not, received by the issuance date of the report. Consideration of such information is beyond the scope of this assessment. Information obtained for this ESA was received from several sources that we believe to be reliable; nonetheless, the authenticity or reliability of these sources cannot and is not warranted hereunder. This assessment was further limited by the following:

- *A chain-of-title and environmental lien search was not performed.*

An evaluation of the significance of these limitations and missing information with respect to our findings has been conducted, and where appropriate, significant data gaps are identified and discussed in the text of the report; however, it should be recognized that an evaluation of significant data gaps is based on the information available at the time of report issuance, and an evaluation of information received after the report issuance date may result in an alteration of our conclusions, recommendations, or opinions. We have no obligation to provide information obtained or discovered by us after the issuance date of the report, or to perform any additional services, regardless of whether the information would affect any conclusions, recommendations, or opinions in the report. This disclaimer specifically applies to any information that has not been provided by the client.

This report represents our service to you as of the report date. Findings in this report are based upon the site's current utilization, information derived from the most recent reconnaissance and from other activities described herein; such information is subject to change. Certain indicators of the presence of hazardous substances or petroleum products may have been latent, inaccessible, unobservable, or not present during the most recent

reconnaissance and may subsequently become observable (such as after site renovation or development). Further, these services are not to be construed as legal interpretation or advice.

1.5 Standard of Care

This ESA was performed in accordance with generally accepted practices of this profession, undertaken in similar studies at the same time and in the same geographical area. We have endeavored to meet this standard of care, but may be limited by conditions encountered during performance, a client-driven scope of work, or inability to review information not received by the report date. Where appropriate, these limitations are discussed in the text of the report, and an evaluation of their significance with respect to our findings has been conducted.

Phase I ESAs, such as the one performed at this site, are of limited scope, are noninvasive and cannot eliminate the potential that hazardous, toxic, or petroleum substances are present or have been released at the site beyond what is identified by the limited scope of this ESA. In conducting the limited scope of services described herein, certain sources of information and public records were not reviewed. It should be recognized that environmental concerns may be documented in public records that were not reviewed. No ESA can wholly eliminate uncertainty regarding the potential for RECs in connection with a property. Performance of this practice is intended to reduce, but not eliminate, uncertainty regarding the potential for RECs. No warranties, express or implied, are intended or made. The limitations herein must be considered when the user of this report formulates opinions as to risks associated with the site or otherwise uses the report for any other purpose. These risks may be further evaluated – but not eliminated – through additional research or assessment. We will, upon request, advise you of additional research or assessment options that may be available and associated costs.

1.6 Reliance

This ESA report is prepared for the exclusive use and reliance of Green Era Educational NFP. Use or reliance by any other party is prohibited without the written authorization of the client and Terracon.

Continued viability of this report is subject to ASTM E1527-13 Sections 4.6 and 4.8. If the ESA will be used by a different user (third party) than the user for whom the ESA was originally prepared, the third party must also satisfy the user's responsibilities in Section 6 of ASTM E1527-13.

1.7 Client Provided Information

Prior to the site visit, Mr. Jason Feldman, client's representative, was asked to provide the following user questionnaire information as described in ASTM E 1527-13 Section 6.

Client Questionnaire Responses

Client Questionnaire Item	Client Did Not Respond	Client's Response	
		Yes	No
Specialized Knowledge or Experience that is material to a REC in connection with the site.			X
Actual Knowledge of Environmental Liens or Activity Use Limitations (AULs) that may encumber the site.			X
Actual Knowledge of a Lower Purchase Price because contamination is known or believed to be present at the site.			X
Commonly Known or Reasonably Ascertainable Information that is material to a REC in connection with the site.			X
Obvious Indicators of Contamination at the site.			X

Terracon's consideration of the client provided information did not identify RECs. A copy of the questionnaire is included in Appendix D.

2.0 PROPERTY OVERVIEW

2.1 Property Location and Land Use

2.1.1 Property Location

The site is located within the northwest 1/4 of Section 33, Township 38 North, Range 14 East of the third principal meridian, Cook County, Illinois. PINs 20-33-119-024, 20-33-124-001, 20-33-124-002 were identified for the site by the client.

2.1.2 Adjacent Property Locations and Land Uses

Adjoining North	Vacant structures (601 West 81st Street).
Adjoining South	East-west oriented West 83rd Street followed by Look Up and Live Gospel Ministries (661 West 83rd Street) and Self Storage Inc. (8316 South Birkhoff Avenue).
Adjoining East	North-south oriented South Wallace Street followed Diamond Waste & Recycling (8149 South Wallace Street) and truck parking lot.
Adjoining West	North-south oriented elevated Metra railroad tracks.

2.1.3 Utilities

The site is in a location where water and sewer connections to the municipal system are required. Metropolitan Water Reclamation District of Greater Chicago (MWRD) and the City of Chicago provide sanitary sewer and potable water services to the site vicinity, respectively. Commonwealth Edison (ComEd) provides electrical service to the area and People's Energy provides natural gas service.

2.2 Physical Setting

2.2.1 Topography

Topography*		
Site Elevation	Approximately 600 feet above National Geodetic Vertical Datum (NGVD).	Blue Island, Illinois USGS Topographic Map, Dated 1997.
Surface Runoff/ Topographic Gradient	Regionally topographic gradient generally slopes to the northeast. Local runoff is carried by the municipal storm water system.	

*Please refer to Exhibit 1 for an excerpt of the topographic map.

2.2.2 Geology/Hydrogeology

Geology/Hydrogeology		
Formation:	Dolomites and limestones of the Silurian-Devonian age lying beneath upper-Devonian shales, Mississippian rocks or Quaternary deposits.	USGS Hydraulic Investigations Atlas 730-K, Dated 1995
Hydrogeologic Gradient:	Based on results from the Follow-Up Phase II report, groundwater flows from the northwest to the southeast portion of the site.	*Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan* prepared by Terracon and dated May 29, 2015.
Soils:	Subsurface consists of approximately 4–8 feet of fill material underlain by sand and then silty clay to at least 24 feet bgs.	*Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan* prepared by Terracon and dated May 29, 2015.
Primary Aquifer	Surficial deposits generally less than 100 feet thick. The occurrence of sand and gravel aquifers difficult to locate.	USGS Hydraulic Investigations Atlas 730-K, Dated 1995
Estimated depth to first occurrence of groundwater	Within approximately three to seven feet below grade surface (bgs) on-site.	*Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan* prepared by Terracon and dated May 29, 2015.

Urban fill material in the City of Chicago typically contains elevated concentrations of polynuclear aromatic hydrocarbons (PNAs) and metals. The presence of urban fill on-site (confirmed in subsurface investigations) constitutes a REC to the site.

2.2.3 Surface Water Bodies

Surface water bodies were not observed on or immediately adjacent to the site.

3.0 PROPERTY BACKGROUND/OPERATING HISTORY

Terracon reviewed the following historical sources to obtain information regarding property background, operating history, and for indications of RECs. Copies of selected historical documents were appended to this report.

3.1 Review of Aerial Photographs

Selected historical aerial photographs, provided by EDR and an online source, Google Earth, were reviewed to obtain information concerning the history of development on and near the site. Evaluation of these aerials may be limited by a photo's quality and scale. Underlined descriptions in the following table indicate additional discussion is offered below the table. Selected photographs are summarized below.

Year	Source	Scale
1938	EDR	1"=500'
1952	EDR	1"=500'
1962	EDR	1"=500'
1964	EDR	1"=500'
1972	EDR	1"=750'
1978	EDR	1"=500'
1984	EDR	1"=500'
1988	EDR	1"=750'
1994	EDR	1"=750'
1999	EDR	1"=500'
2005	EDR	1"=500'
2007	EDR	1"=500'
2009	EDR	1"=500'
2010	EDR	1"=500'
2011	EDR	1"=500'
2012	EDR	1"=500'
2018	Google	1"=500'

Historical Aerial Photographs

Direction	Description
Site	Appears mostly vacant with a *small structure on the northwest corner* and an additional larger rectangular structure on the northeast corner (1938, 1952); *nine vertical rows of apparent automobiles* and the former structure on the northwest position of the site no longer present (1962, 1964, 1972, 1978, 1984); structure on the northeast corner of the site is no longer present (1988, 1994, 1999, 2005, 2007, 2009); site is vacant (2010); two piles of potential *dumped debris located on the southeast corner of the site* (2011, 2012); the site is vacant (2018).
North	East-west oriented West 82nd Street followed by *four large rectangular buildings* (1938, 1952, 1962, 1964, 1972, 1978, 1984); western most structure no longer depicted ("storage warehouse") (1988, 1994); eastern most structure no longer depicted (unknown usage) (1999, 2005, 2007, 2009, 2010, 2011, 2012); north central structure no longer depicted (unknown usage) (2018).
East	A north-south oriented road (South Wallace Street) followed by a *rectangular structure* (1938, 1952); an additional rectangular structure (tile cutting warehouse further discussed in Section 3.3) (1962, 1964); an additional rectangular structure to the southeast (1972, 1978, 1984, 1988, 1994); vacant land used for truck and trailer storage (1999, 2005, 2007, 2009, 2010, 2011, 2012, 2018).
South	East-west oriented West 83rd Street followed by two rectangular structures (661 West 83rd Street, and 8316 South Birkhoff Street) and a vacant grassed area (1938, 1952); apparent automobiles in the former vacant grassed area north of South Birkhoff Street (1962, 1964); the apparent existing park area north of South Birkhoff Street (1972, 1978, 1984, 1988, 1994, 1999, 2005, 2007, 2009, 2010, 2011, 2012, 2018); graded land at 661 West 83rd Street (1988, 1994, 1999, 2005, 2007); the apparent existing building at 661 West 83rd Street (2009, 2010, 2011, 2012, 2018).
West	Southwest-northeast oriented railroad tracks followed by apparent residential structures similar to the existing structures (1938, 1952, 1962, 1964, 1972, 1978, 1984, 1988, 1994, 1999, 2005, 2007, 2009, 2010, 2011, 2012, 2018).

The small structure on the northwest corner of the site correlates to the paint storage structure identified on the 1910 through 1975 Sanborn maps, and the nine vertical rows of apparent automobiles correlate to the Chicago Auto Pound identified on the 1987 through 2004 Sanborn maps.

3.2 Review of Topographic Maps

Selected USGS topographic maps were viewed from those provided by EDR and an online source, www.historicaerials.com, to evaluate past uses and relevant characteristics of the site and surrounding properties. The following topographic maps were reviewed. A copy of the most current available USGS topographic map is included as Exhibit 1, with the remainder provided in Appendix B.

- Blue Island, Illinois Quadrangle, scaled 1:62,500 (**1929**)
- Blue Island, Illinois Quadrangle, scaled 1:24,000 (1963, photorevised **1973**)
- Blue Island, Illinois Quadrangle, scaled 1:24,000 (**1993**)
- Blue Island, Illinois Quadrangle, scaled 1:24,000 (**1997**)

Historical Topographic Maps

Direction	Description
Site	Several large rectangular structures (in the place of stockpiles further discussed in Section 3.3 – Review of Sanborn Maps) in addition to a rail spur along the south and west property boundaries (1929); vacant with the exception of a rectangular structure on the northeast corner (1973, 1993, 1997).
North	Several large rectangular structures (in the place of lumber storage structures further discussed in Section 3.3 – Review of Sanborn Maps) in addition to a rail spur along the north property boundary (1929, 1973); west-most rectangular structure no longer depicted (1993, 1997).
East	A north-south oriented road followed by vacant land on the north and a large structure on the south (further discussed in Section 3.3 – Review of Sanborn Maps) (1929); north-south oriented road followed by multiple rectangular structures (further discussed in Section 3.3 – Review of Sanborn Maps) (1973, 1993, 1997).
South	An east-west oriented road followed by several large rectangular structures (1929); area south of road is vacant or shaded pink to indicate densely developed area (1973, 1993, 1997).
West	Southwest-northeast oriented railroad tracks followed by several small rectangular structures indicating single-family residential development (1929); pink shaded area west of railroad tracks indicating dense urban development (1973, 1993, 1997).

**Based on the color-coding of the topographic maps (shading), the site and surrounding areas appear to be included in a densely developed area. Structures are not depicted on these maps in the area of the subject site or surrounding properties; however, this does not necessarily indicate that these areas were undeveloped as of the date on the maps. Street development, however, is depicted on these maps.*

3.3 Review of Sanborn Maps

Historical fire insurance maps produced by the Sanborn Map Company were requested from EDR to evaluate past uses and relevant characteristics of the site and surrounding properties. Underlined listings indicate that additional discussion is provided following the table. EDR provided Sanborn maps as summarized below.

- EDR – 1897, 1910, 1924, 1951, 1975, 1987, 1989, 1992, 2002, 2004.

Historical Sanborn Fire Insurance Maps

Direction	*Description*
Site	Vacant parcels bisected by an east-west traversing West 82nd Place and a small structure on the far southwest corner labeled "Station" with two additional illegible words (1897); International Harvester development consisting of eleven areas of stock storage (on the southwest and northeast portions of the site), ten areas of lumber storage (primarily on the southeast and northwest portions of the site), two structures labeled "dry kilns" on the northeast portion, and four areas of spoke and hub storage (throughout the site), a 100,000-gallon gravity-fed water tower (still present). *Structure labeled "paint storage" on the northwest corner of the site in addition to three 12,000-gallon benzene and linseed oil USTs* as well as a rail spur crossing the site to the north adjoining property (1910, 1924); stock piles and benzene tanks no longer labeled, site identified as International Harvester Co. Weber Works (paint storage, rail spur and water tower still depicted), structure on the northeast corner labeled, "Masonite Tile Warehouse" (1951, 1975); paint storage structure and Masonite Tile Warehouse no longer depicted, site labeled "*Chicago Auto Pound*" (1987, 1989, 1992, 2002); rail spur no longer depicted (2004).
North	East-west oriented West 82nd Street followed by vacant land and a structure labeled "Storage" followed by a lumber storage yard (1897); a rail spur followed by mill construction, lumber storage and a "forge shop" along with a circular object labeled "paint kettle" (1910, 1924); lumber storage structure no longer depicted (1951, 1975, 1987); mill construction structure no longer depicted (1989, 1992, 2002, 2004).
East	North-south oriented South Wallace Street followed by vacant land and single-family residential structures (1897, 1910); a 600,000-gallon "reservoir" of unknown material, with piping leading to fire pumps to the north, a "rim bending shop" and a wagon stock yard (1924); rim bending shop structure remains; however, unlabeled (1951); *A & Lub Oil Warehouse with four apparent oil tanks of unknown volume*, a "Masonite Tile Factory structure" (1975); structure now unlabeled (1987, 1992); *junk yard depicted north of A & Lub bulk oil station* (2002, 2004).
South	East-west oriented West 83rd Street followed by an area not mapped (1897); International Harvester wagon stock sheds and vacant land south of West 83rd Street (1910); expanded wagon storage sheds (1924); John's Bake Shop (671-653 West 83rd Street), Ideal School Supply Co. (8316-8340 South Birkhoff Avenue) and vacant land (1951); Dalton Gorman Industries, Manufactured Molded Marble Products (671-653 West 83rd Street), Lighting Fixture warehouse, and Otten Bobby Pin Manufacturing (8316-8340 South Birkhoff Avenue) and vacant land (1975); vacant land at 671-673 West 83rd Street (1987, 1989, 1992, 2002, 2004).
West	Southwest-northeast oriented railroad tracks (elevated on dirt fill, labeled "GRI&P Railroad") followed by apparent residential garage and residential structures (1897, 1910, 1924, 1951, 1975, 1987, 1989, 1992, 2002, 2004).

The site consisted of vacant land bisected by West 82nd Place and a small unidentified "station" structure on the southwest corner in 1897. From at least 1910 through 1924 the site

consisted of lumber storage structures and stock piles associated with International Harvester. A paint storage structure was present on the northwest corner of the site from at least 1910 through 1975 and three 12,000-gallon benzene USTs were located in the same area from at least 1910 through 1924. The site was developed as an automotive impoundment lot from at least 1987 through 2002 and has apparently been vacant since 2004.

On-site RECs identified during the Historical Sanborn Map review include the following:

- Potential for wood preservative (such as coal tar/creosote) application and storage to have caused releases in association with lumber stockpiles and rail spurs on site;
- Potential lead-based paint releases from paint storage structure as storage took place on site for at least sixty-five years;
- The potential for releases of petroleum products from impounded automobiles stored on site from at least 1987 through 2002.

The presence of, and potential for releases from three 12,000 benzene USTs on-site from at least 1910 through 1924 was negated by subsurface investigations carried out by Terracon personnel. The samples collected from borings B-1 through B-3 and the borings related to the tanks, did not return elevated levels of VOCs following laboratory analysis.

Additional off-site facilities were identified in the review of Sanborn Maps, and are further discussed in Section 4.1 – Regulatory Database Search and Significant Findings. Industrial and fuel storage/dispensing facilities of various types have been located to the north, east and south of the site in various forms from at least 1910 through the present.

3.4 Review of City Directories

The Haines, R.L. Polk & Co. and R.H. Donnelley directories used in this study were made available through Historic Information Gatherers, Inc. (selected years reviewed: 1929, 1950, 1954, 1958, 1963, 1969, 1974, 1979, 1984, 1989, 1994, 1999, 2004, 2009, 2018) and were reviewed at approximate five-year intervals, if readily available. Since these references are copyright protected, reproductions are not provided in this report. The current street address for the site was identified as 650 West 83rd Street, Chicago. Underlined and italicized facilities are further discussed below this table and/or in Section 4.1 – Federal and State / Tribal Databases or below the following table.

Historical City Directories

Direction	Description
Site	**650 West 83rd Street:** Not listed (1929, 1954, 1958, 1963); *Chgo Auto Pounds* (1969, 1974); *Cty Pol Ato Pnds 2* (1979, 1984); *Chgo Cty Pol Auto 1* (1989); not listed (1994, 1999, 2004, 2009, 2018). **8208-8224 South Wallace Street:** Not listed (1929, 1954, 1958, 1963, 1969); Evergreen Pk Sls (1974); not listed (1979, 1984, 1989, 1994, 1999, 2004, 2009, 2018).
North	**601 West 81st Street:** Inter Harvester Co Weber Works (storage) (1929); not listed (1954); Gordon Sales Management (1958); Progressive Sheet Metal Incorporated (1963); *Advance Adhesive Incorporated* (1969); *Advance Adhesives*, Asbestos Wood Mfg, Dalyn Co, Hamilton Plywood Co, Leinweber FH Co, Paco Co, Spar Warehouse & Distr, Spar Warehouse & Dist, Wrapping Equipment (1974); *Advance Adhesives*, Asbestos Wood Mfg, Blue Cross Chemical, Cryogool Chgo Inc, Paco Co, Spar Warehouse & Distr (1979); *Advance Adhesives*, Asbestos Wood Mfg, Spar Warehouse & Distr, Zarov Chem Co. (1984); AWMCO Inc. (1989, 1994, 1999, 2004); Abbitt Adhesives, Inc., AWMCO Inc. (2009). **8149-8159 South Wallace Street:** Not listed (1929); *Bohnett Oil Co.* (1954,1958); Degroot Fred, *Lind Fuel Co, Midwest Fuel Transportation* (1963, 1969); not listed (1974); *Cross City Scavengers* (1979); not listed (1984, 1989, 1994, 1999, 2004); *Diamond Waste & Recycling* (2009, 2018).
East	**8201-8259 South Wallace Street:** Not listed (1929); Miratile Mfg (1954, 1958, 1963); Abitibi Corp (1969, 1974, 1979); Marquette Bolt & Rvet Tech Treat Inc. (1984); not listed (1989, 1994, 1999, 2004, 2009, 2018).
South	**653-671 West 83rd Street:** John's Bake Shop (1929, 1954); Biehl & Livingston Pakg Company Inc. (1958, 1963); Dalton & Gorman Inds (1969, 1974); not listed (1979); JS Auto Clinic (1984); not listed (1989, 1994, 1999, 2004, 2009, 2018). **8316-8340 South Birkhoff:** Ideal School Supply Co. (1929, 1954, 1958, 1963); Lady Lora Co Inc., Otten Mfg Co. (1969); same as prior and Triangle MBL HM and Triangle Home Prods (1974); Lady Lora Co. Inc., Otten Mfg Co. (1979); Natl Porges Radiatr (1984); Malnekoff Entprs, Natl Porges Radiatr (1989); *Oxford Metal* (1994, 1999); 83rd Halsted Self Storage Inc, U-Haul (2004); 83rd & Hlstd Slf Strg Inc Wst, Aaron Bros Slf Strg Inc, and U-Haul Company (2009); 83rd Halsted Self Storage Inc, U-Haul Neighborhd Dealer, and 83rd & Hlstd Slf Strg Inc Wst (2018).
West	Rail berm followed by single-family residential structures.

The property at 8149 through 8159 South Wallace Street is located on the east and northeast adjoining property in a down-gradient position relative to the site. The facility was identified as a fuel storage facility from at least 1954 through 1969 and as a junk yard from 1979 through 2009. The property remains developed with a recycling facility and is further discussed in Section 4.1 – Federal and State / Tribal Databases.

3.5 Title Search / Environmental Lien Search

Environmental lien and title records for the site were not provided by the client. At the direction of the client, performance of a review of these records was not included as part of the scope of services. Unless notified otherwise, we assume that the client is evaluating this information outside the scope of this report.

3.6 Previous Reports

Previous environmental reports for the site were provided by the client to Terracon for review. A summary of the findings of these reports is provided below. This summary is based solely on the information provided in the referenced documents. Terracon offers no assessment regarding the quality, completeness and/or accuracy of the information provided. This information is being considered solely in the context of additional historical information made available for the site.

- Phase I Environmental Site Assessment
  650 West 83rd Street, Chicago, Cook County, Illinois
  Prepared by: Terracon
  Dated: July 2, 2013

The report assessed the current site, which was described as "a fenced area at the northwest corner of South Wallace Street and West 83rd Street." Terracon identified the following RECs in connection with the site during the 2013 Phase I ESA:

- "Potential for wood preservative (such as coal tar/creosote) application and storage to have caused releases in association with the lumber stockpiles and rail spurs on site;
- Potential lead-based paint releases from former paint storage structure on the northwest corner of the site;
- The potential presence of known USTs on the site based on the historical industrial operations;
- The presence of, and potential for releases, from three 12,000-gallon benzene and linseed oil USTs on-site from at least 1910 through 1924;
- The potential for releases of petroleum products from impounded automobiles stored on-site from at least 1962 through 2009;
- The potential impact to the site from the on-site SPILLS listing;
- Potential for miscellaneous dumped material to be contaminated with petroleum products, or other chemicals and to have impacted the site;
- The potential for impact to the site from the recorded release and storage of petroleum products and hazardous materials at the east adjoining facility (8201 South Wallace Street);

- Industrial operations, and paint and fuel storage facilities of various types have been located to the north, east, and south of the site in various forms from at least 1897 through the present, and their potential impact; and,
- Likely present on-site urban fill material."

Terracon's 2013 Phase I ESA did not provide recommendations in the report.

- Phase II Environmental Site Assessment
  650 West 83rd Street, Chicago, Illinois
  Prepared by: Terracon
  Dated: August 5, 2013

The Phase II ESA was conducted to establish the presence or absence of impacts to the site associated with the RECs identified in Terracon's 2013 Phase I ESA (previously discussed above). Illinois Environmental Protection Agency (IEPA) Site Remediation Program (SRP) requirements for data quality, usability, and validation were met during the Phase II as the site was not [currently] enrolled into the IEPA's SRP "but may be enrolled at a later date." The report states that the site would be potentially redeveloped as an anaerobic digester and other related uses.

Between June 25 and June 28, 2013, Terracon advanced 37 soil borings throughout the site. Thirty-five of the soil borings were advanced to a depth of 16 feet below ground surface (bgs) and two soil borings were advanced to a depth of 24 feet bgs. Subsurface materials consisted of 6 to 8 feet of urban fill material (dark brown to black clay/sand/gravel mixtures with bricks, cinders, wood, and glass) underlain by 6 inches to 5 feet of dark brown sand. Beneath the sand, gray silty clay with trace sand and gravel was encountered to a maximum of 24 feet bgs. Soil samples were continuously collected from each boring and screened using a photoionization detector (PID) from 0 to 3 feet bgs and 3 to 16 feet bgs. A total of 74 soil samples were collected and 70 of the soil samples were submitted for laboratory analysis of PNAs, Target Analyte List (TAL)/Resource Conservation and Recovery Act (RCRA) Metals, Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX), VOCs, semivolatile organic compounds (SVOCs), Pesticides, Polychlorinated Biphenyls (PCBs), Herbicides, Fraction Organic Carbon (FOC), and pH.

Three soil borings were converted to temporary groundwater monitoring wells (denoted as MW-5, MW-10, and MW-34). Groundwater was observed at 5.19 feet bgs in MW-5; 1.5 feet bgs in MW-10; and 1.91 feet bgs in MW-34. Groundwater samples were collected from each well and submitted for laboratory analysis of VOCs, SVOCs, Pesticides, PCBs, Inorganics, and Herbicides. Terracon returned to the site on July 3, 2013 to conduct a slug test to determine the hydraulic conductivity and determine groundwater classification. Approximately 6 gallons of water were pumped out of MW-5 and depressed the water level 1.25 feet.

Groundwater was observed at the initial elevation within approximately 6 minutes. Hydraulic conductivity was determined to be 2.7 x 10^{-3} cm/second and groundwater was classified as Class I designation.

Analyte concentrations were compared to the Tiered Approach to Corrective Action Objectives (TACO) Tier I SROs and GROs. Based on the planned potential redevelopment of the site, analytical results were compared to the Tier I SROs for the Residential, Industrial/Commercial, and Construction Workers scenarios; Tier I Soil Component of Class I Groundwater Ingestion; and Tier I Class I GROs. The following exceedances were detected during the laboratory analysis:

- VOCs, PNAs, and inorganics were detected above applicable Tier I SROs;
- The sum of PNA concentrations in B-14 exceed the default subsurface attenuation capacity;
- Hazardous concentrations of lead were detected in B-11 and B-16 through Toxicity Characteristic Leaching Procedure (TCLP) analysis; and,
- Lead, manganese, and iron were detected above the Tier I GROs for Class I groundwater in groundwater samples.

Results of borings B-1 through B-3 did not identify a VOC release from the area noted with benzene tanks identified as a REC in the 2013 Phase I ESA. Terracon recommended that the site soil and groundwater be properly managed and/or disposed of during any future redevelopment activities. Additional investigation would be required to delineate the extent of impacted soil and groundwater.

- Follow-Up Phase II Environmental Site Assessment
  650 West 83rd Street, Chicago, Illinois
  Prepared by: Terracon
  Dated: October 28, 2013

The follow-up Phase II was conducted to further investigate impacts identified in Terracon's previous 2013 Phase II ESA. Between September 26 and September 27, 2013, Terracon advanced 40 soil borings at the site to depths of 4 to 16 feet bgs. An additional 13 soil borings were advanced at the site on October 23, 2013 to collect additional soil samples from depth to help delineate the south extent of hazardous impacts on the western portion of the site. Soil samples were continuously screened using a calibrated Photoionization detector (PID). Soil samples were collected 20 feet in each cardinal direction from previously impacted borings. Additional samples were collected 40 feet in each cardinal direction from the previously impacted borings and placed on hold pending initial analytical results. A total of 75 soil samples were collected and 52 soil samples were submitted for laboratory analysis of PNAs, TPH, total metals, TCLP metals, pH, BTEX, and elemental mercury.

One new temporary monitoring well (denoted as MW-122) was installed per 2FM approval. Groundwater samples were collected from the previously installed MW-5 and MW-34, as well as MW-122. MW-10 was reportedly destroyed and could not be sampled during this investigation. Groundwater samples collected were submitted for laboratory analysis of VOCs, SVOCs, pesticides, PCBs, TAL inorganics, and pH.

Four soil gas borings were advanced immediately adjacent to B-8, B-14, B-16, and B-35. Soil gas samples were collected from a minimum of 3 feet bgs and above the saturated zone. The soil gas samples were submitted for laboratory analysis of naphthalene and VOCs.

Analyte concentrations were compared to the Tier I SROs and Tier I GROs. Based on the planned potential redevelopment of the site, analytical results were compared to the Tier I SROs for Residential, Industrial/Commercial, and Construction Worker scenarios; Tier I Soil Component of Class I Groundwater Ingestion; and Tier I Class I GROs. The following exceedances were detected during laboratory analysis:

- PNA concentrations were detected in soils exceeding SROs for Residential, Industrial/Commercial and Construction Worker exposure routes exceeding the construction worker ingestion exposure route;
- Detections of arsenic and lead in soils in the southwest portion of the site decreased from the previous investigation, and no longer exceed the exposure route for Construction Workers, the least stringent exposure route;
- The groundwater sample collected from MW-122 contained similar inorganic impacts as MW-5 and MW-34; however, exceedances above the Tier I GROs for indoor vapor intrusion were not identified; and,
- Soil gas samples did not exhibit exceedances of Tier I GROs for indoor vapor intrusion exposure route.

Terracon recommended that the impacted soil and groundwater be properly managed and/or disposed of during redevelopment activities. “Should site remediation be desired, further delineation of areas identified with hazardous waste lead and natural attenuation exceedances is suggested, especially in the western portion of the site, to potentially better define the limits of remediation necessary.”

- Phase I Environmental Site Assessment
  650 West 83rd Street, Chicago, Illinois
  Prepared by: Terracon
  Dated: May 1, 2015

The May 2015 Phase I ESA conducted by Terracon identified the following RECs in connection with the site: areas with hazardous lead, attenuation, VOC, and inorganic impacts to the site’s soil, groundwater, and/or soil gas; potential for wood preservative (such as coal

tar/creosote) application and storage to have caused releases in association with lumber stockpiles and rail spurs on site; potential lead-based paint releases from paint storage structure as storage took place on site for at least sixty-five years; the potential presence of unknown USTs on the site based on historical industrial operations; the potential for releases of petroleum products from impounded automobiles stored on site from at least 1962 through 2009; SPILLS No. NL860889 based on the unknown content, extent, and location of the release; and, impacted urban fill was verified to be on-site during 2013 and 2015 subsurface investigations.

- Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan
  650 West 83rd Street, Chicago, Illinois
  Prepared by: Terracon
  Dated: May 29, 2015

The purpose of the report was to identify RECs and related COCs. The report included the following three parts:

  - Site Investigation, which consisted of the previous environmental and subsurface investigations, as well as a 2015 investigation to delineate the extent of attenuation and hazardous waste lead exceedances. PNA concentrations in three samples exceeded the attenuation capacity for subsurface soil; lead concentrations in four samples analyzed with TCLP exceeded hazardous waste criteria; and chemical impacts to groundwater include lead, aluminum, iron, manganese, and thallium above GROs for Class I groundwater ingestion exposure route.

  - Remediation Objectives consisted of comparing analytical results of samples collected to their appropriate remedial objectives.

  - RAP to satisfy remedial requirements in accordance with TACO. The RAP indicated that remedial actions would include in-situ chemical treatment, remedial excavation, engineered barriers, and, use of the City of Chicago groundwater ordinance and off-site notifications.

  - The groundwater flow direction was determined to be towards the southeast.

- Letter from the IEPA to City of Chicago
  Prepared by: IEPA
  Dated: August 20, 2015

The letter indicated that the above-referenced Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan was approved by the IEPA, with

the condition that the location and dimensions of the Soil Management Zone (SMZ) should be provided in a RAP update.

- Phase I Environmental Site Assessment Update
  650 West 83rd Street, Chicago, Illinois
  Prepared by: Terracon
  Dated: November 23, 2015

The November 2015 Phase I ESA Update conducted by Terracon identified the following RECs in connection with the site: areas with hazardous lead, attenuation, VOC, and inorganic impacts to the site's soil, groundwater, and/or soil gas; potential for wood preservative (such as coal tar/creosote) application and storage to have caused releases in association with lumber stockpiles and rail spurs on site; potential lead-based paint releases from paint storage structure as storage took place on site for at least sixty-five years; the potential presence of unknown USTs on the site based on historical industrial operations; the potential for releases of petroleum products from impounded automobiles stored on site from at least 1962 through 2009; SPILLS No. NL860889 based on the unknown content, extent, and location of the release; impacted urban fill was verified to be on-site during 2013 and 2015 subsurface investigations; and, the active SRP listing based on the absence of a NFR determination to date.

- Letter from the IEPA to Green Era Educational NFP
  Prepared by: IEPA
  Dated: September 5, 2017

The letter indicated that as a part of the Revolving Loan Fund, the IEPA updated the review of the above-referenced Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan. The four comments provided are summarized as follows:

  - The sampling rate for clean soil imported to the site should be adjusted to one sample per 500 yd^3 (to reflect updated IEPA guidance);
  - Mercury and naphthalene were detected on site but at concentrations in soil gas and groundwater less than the indoor inhalation ROs. Since volatiles were detected, there will be a restriction that will require full concrete foundations with no interior sump pumps;
  - Details of the proposed Soil Management Zone need to be submitted including a figure with the three-dimensional boundaries;
  - A new DRM-1 Form needs to be provided to IEPA for the new property owner.

- Remedial Action Plan Addendum
  650 West 83rd Street, Chicago, Illinois

Prepared by: Terracon
Dated: January 21, 2020

This RAP Addendum provides supplemental soil data results, updates the new site owner's development plans, proposes the use of an alternative engineered barrier and new Tier 2 RO, and provides responses to IEPA's comments from their letter dated September 5, 2017. The RAP Addendum is summarized as follows:

- As stated in the 2015 CSIR/ROR/RAP, soil sampling conducted by Terracon in February 2015 could not be completed due access restrictions around borings B-1, B-2, B-3 and B-36. The soil sampling was proposed to further evaluate potential exceedances for the soil component of the groundwater ingestion exposure pathway and verify the extend of hazardous lead surrounding B-3. Since that time, the access restrictions were removed, and Terracon mobilized to the site to collect additional soil samples.

  On February 13, 2018, four soil borings were advanced at the site as planned in the IEPA-approved RAP and submitted to the laboratory for analysis for synthetic precipitation leaching procedure (SPLP) inorganics and TCLP lead at select samples. The results of the SPLP analyses were below the Tier 1 GROs for each of the metals analyzed. It was indicated that transport modeling noted in the 2015 ROR is not required for these constituents. Results of the TCLP lead analyses indicated exceedances of the Class I GRO but were below the criteria for characteristic hazardous waste. The B-1b, B-2b, and B-3b boring locations are within the proposed hazardous waste lead treatment area. Further TCLP lead sampling will be conducted as part of the treatment outlined in the previously approved RAP.

- The revised development plan depicting the planned site features was provided to IEPA.

- Additional analysis was conducted to limit the areas of the site requiring an engineered barrier to exclude the ingestion exposure route. The RAP Addendum detailed that in the 2015 CSIR/ROR/RAP, engineered barriers were planned throughout the remediation site to exclude the industrial/commercial exposure route. Upon further evaluation of the data to the Tier 1 SROs, the original extent was overly conservative and based on the data, engineered barriers are not required in portions of the site located in the southeast corner and western portions of the site. Additionally, based on a new slope factor adopted by IEPA for toxicology calculations, additional areas of the site impacted by benzo(a)pyrene were proposed to be excluded from need for an engineered barrier based on a Tier 2 RO calculated. Exhibits and tables were provided to detail the areas described.

- The RAP Addendum proposed to revise the engineered barrier previously proposed for affected landscaped areas from 3 feet of soil to a geotextile and 18 inches of clean soil. The geotextile proposed was US 100NW-HVO Warning Barrier, manufactured by US Fabrics, Inc., or a comparable geotextile product.

- The RAP Addendum responded to each of IEPA's September 5, 2017, comments, including acknowledging collection of one sample per 500 yds^3 of clean fill import; providing updates to the sump pits planned for the site (outside the building footprint); providing the soil management plan details and exhibit for the site, which would include a mounded area on the eastern portion of the site; and provision of a new DRM-1 for the new property owner, Green Era NFP.

- Letter from the IEPA to Green Era Educational NFP
  Prepared by: IEPA
  Dated: February 7, 2020

The letter acknowledged receipt of the DRM-1 form with the new owner (Green Era Educational NFP) and SRP partial payment.

- Letter from the IEPA to Green Era Educational NFP
  Prepared by: IEPA
  Dated: March 2, 2020

The letter indicated that the above-referenced Amended Remedial Action Plan was conditionally approved by the IEPA, with the following information for files:
The proposed alternative barrier included use of US 100NW-HVO Warning Barrier or a comparable geotextile product. IEPA requests that an amended RAP be submitted for review once the exact geotextile product to be used is known, along with the product specification page and a small sample of the product. The report must include a table indicating the contaminant types, level and locations to be covered by the alternative barrier.

4.0 REGULATORY REVIEW

Regulatory database information was provided by EDR, a contract information services company. Information in this section is subject to the accuracy of the data provided by the information services company and the date at which the information is updated, and the scope herein did not include confirmation of facilities listed as "unmappable" by regulatory databases.

4.1 Regulatory Database Search and Significant Findings

Listed below are the facility listings identified on federal, state/tribal, and private databases within the ASTM-required search distances from the approximate site boundaries, as appropriate. Database definition, descriptions, and the database search report are included in Appendix D – Regulatory Database Information.

Federal and State/Tribal Databases

Database	Description	Radius (Miles)	Number of Facilities
Federal			
NPL	The National Priorities List (NPL) is the USEPA's database of uncontrolled or abandoned hazardous waste facilities that have been listed for priority remedial actions under the Superfund Program.	1.0	0
SEMS/ SEMS-Archive	The SEMS database (formerly CERLIS) is a compilation of facilities which the USEPA has investigated or is currently investigating for a release or threatened release of hazardous substances pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980. SEMS-Archive [formerly NFRAP (No Further Remedial Action Planned)] refers to facilities that have been removed and archived from its inventory of sites.	0.5	0
ERNS	The Emergency Response Notification System (ERNS) is a listing compiled by the USEPA on reported releases of petroleum and hazardous substances to the air, soil, and/or water.	Site	0
RCRA Generators	The Resource Conservation and Recovery Act (RCRA) Generators database, maintained by the USEPA, lists facilities that generate hazardous waste as part of their normal business practices. Generators are listed as large, small, or conditionally exempt. Large quantity generators (LQG) produce at least 1000 kg/month of non-acutely hazardous waste or 1 kg/month of acutely hazardous waste. Small quantity generators (SQG) produce 100-1000 kg/month of non-acutely hazardous waste. Conditionally exempt small quantity generators (CESQG) are those that generate less than 100 kg/month of non-acutely hazardous waste.	Site and adjoining properties	2
RCRA CORRACTS	The USEPA maintains a database of RCRA facilities that are undergoing "corrective action". A "corrective action" order is issued when there has been a release of hazardous waste or constituents into the environment from a RCRA facility.	1.0	0
RCRA TSDs	The RCRA TSD Database is a compilation by the USEPA of facilities which reportedly treat, store or dispose of hazardous waste.	0.5	0
US Brownfields	Abandoned or underused industrial and/or commercial properties that are contaminated (or thought to be contaminated) and have an active potential for redevelopment.	0.5	0
RCRA NonGen/NLR	RCRA - Non Generators / No Longer Regulated	0.25	4

Database	Description	Radius (Miles)	Number of Facilities
State/Tribal			
SSU	The IEPA maintains a database of state equivalent CERCLIS list sites (SSU) that are planned for cleanup using state funds or by potentially responsible parties.	0.5	0
SRP	The IEPA maintains a database that contains sites which have voluntarily enrolled in the Site Remediation Program (SRP). This program provides oversight of the site assessment and site remediation performed by the voluntary parties. The intent of this program is to provide applicants the opportunity to receive review and evaluation services, technical assistance and no further remediation determinations from the IEPA.	0.5	9
LUST	The IEPA maintains a database of sites with documented releases from USTs known as Leaking Underground Storage Tanks (LUST) facilities.	0.5	16
SWDF	The IEPA maintains a database of Solid Waste Disposal Facilities located within Illinois. The database information may include the facility name, class, operation type, area, estimated operational life, and owner.	0.5	0
UST	The Office of the State Fire Marshal (OSFM) has compiled a database of registered USTs which may include information such as the owner, contents, age and location of the USTs.	Site and adjoining properties	0
IC/EC	Institutional controls (ICs) consist of legal or administrative restrictions on land use and/or other activities which limit exposure to contamination. Engineering controls (ECs) include those with engineered barriers (*e.g.,* asphalt or concrete paving).	0.5	5/4
SPILLS	State spills	Site	1
Proprietary			
EDR Historical Auto Stations	A list of Historical Auto stations has been compiled by EDR through a search of selected national collections of business directories for keywords such as gas station, automotive repair, etc.	0.25	9
EDR Historical Cleaners	A list of Historical Cleaners has been compiled by EDR through a search of selected national collections of business directories for keywords such as dry cleaners, laundry, wash & dry, etc.	0.25	1
EDR Manufactured Gas Plant	A list of Manufactured Gas Plants has been compiled by EDR through a search of selected national collections of business directories for keywords such as gas plant, manufactured gas plant, etc.	1.0	0

The following table summarizes the site-specific information provided by the database and/or gathered by this office for identified facilities within approximately 300 feet of the site. Facilities are listed in order of proximity to the site. Additional discussion for selected facilities may follow the summary table. Facilities identified as Chicago ENV are listed on the Chicago Department of Public Health (CDPH) Environmental Records Lookup Table, which is a

summary of publicly accessible records available on the City of Chicago's Data Portal. Facilities only listed under Chicago ENV are summarized in Appendix D.

Listed Facilities

Facility Name and Location	Estimated Distance/Direction/Topographic Gradient[3]	Database Listings
City of Chicago-Dept of Fleet Mgmt/Old City Pound 650 West 83rd Street	Site	Chicago ENV, SPILLS, SRP
Advanced Adhesives 601 West 81st Street	North adjacent / up-gradient	RCRA-SQG
Hansen-Sterling Drum Co. 8101 South Wallace Street	Northeast adjacent / up-gradient	RCRA-NonGen/NLR, FINDS, ECHO
Small Business Admin. 8201 South Wallace Street	East adjacent / cross-gradient	LUST
Oxford Metal Inc 8316-8340 South Birkhoff Avenue	South adjacent / down-gradient	RCRA-VSQG
Putnam Bros. 8256-8258 Emerald Avenue	Approximately 300 feet / west / cross-gradient	Historical Auto Station

City of Chicago-Dept of Fleet Mgmt /Old City Pound

The site (addressed as 650 West 83rd Street) was identified as a Chicago ENV, SPILLS, and SRP facility in the regulatory database report. The site was identified as a Chicago ENV facility due to on-site inspections. The listing did not contain additional information. A release of unknown content and extent was reported to the Office of Emergency Response, which assigned SPILLS No. NL860889 to the release. The IEPA received notification of the SPILLS incident on August 14, 1986. Additional information was not available for the listing.

The site was enrolled into the SRP on February 9, 2015 by Terracon. Previous investigation reports prepared by Terracon were discussed in Section 3.6. According to the IEPA SRP database, the site is actively undergoing remediation through the SRP. To date, an NFR determination has not been issued for the listing.

Based on the unknown content, extent, and location of the release, SPILLS No. NL860889 constitutes a REC to the site.

Advanced Adhesives

Advanced Adhesives (addressed as 601 West 81st Street) was identified as a RCRA-SQG facility, located on the south adjacent property in a hydrogeologically up-gradient position relative to the site. According to the regulatory database report, in at least 2019 the business

[3] Based on data from the Cook County online GIS system, and visual and historical data review.

generated ignitable waste and dichloromethane. RCRA violations were not reported at the facility. Based on the non-corrective action regulatory status, the listing is not considered a REC to the site.

Hansen-Sterling Drum Co.

Hansen-Sterling Drum Co. (addressed as 8101 South Wallace Street) was identified as a RCRA-NonGen/NLR, FINDS, and ECHO facility, located on the northeast adjacent property across South Wallace Street in a hydrogeologically up-gradient position relative to the site. According to the regulatory database report, the business historically generated ignitable waste, corrosive waste, acrylic acid, vinyl chloride, etc.; however, the database report did not identify the RCRA status associated with the generation of the aforementioned wastes. Presently, the business is identified as a NonGen/NLR and does not generate hazardous waste. The IEPA was notified of the change in status on August 18, 1980 with no reported violations. The facility is identified on the FINDS and ECHO databases. Based on the non-corrective action regulatory status, the listings are not considered RECs to the site.

Small Business Admin.

Small Business Admin. (addressed as 8201 South Wallace Street) was identified as a LUST facility, located on the east adjacent property across South Wallace Street in a hydrogeologically cross-gradient position relative to the site. A fuel oil and "non-petroleum fuel oil" release was reported to the IEMA on November 7, 1991 and assigned LUST No. 913213. A Notice of Release was received by the IEPA on November 18, 1991. Investigation or remediation reports were not identified on the IEPA LUST Incident Tracker. The following documents were available for the facility via the IEPA Document Explorer:

- Illinois Emergency Services and Disaster Agency (ISDA) Incident No. 913213 Field Report, dated November 7, 1991, indicating that a leak or spill of methyl ethyl ketone, tophate, or fuel oil occurred from a UST due to its age on November 5, 1991.
- Letter from the SBA to IEPA, dated December 8, 1991, indicating that an engineering company was hired to perform an environmental audit at the facility. The letter further stated that there were no current leaking USTs and the tanks had not been used in 10 years; a visual inspection of aboveground releases or exposed subsurface releases was conducted; fire and safety hazards posed by vapors or free product was being monitored; measurement for the presence of releases at various locations was being conducted; and, sampling locations and measurement methods accounted for the nature of the stored substance, type of backfill, depth to groundwater, etc.
- NFR letter dated January 26, 2010, indicating that further investigation for LUST #913213 was not necessary and the IEPA released the SBA of all liability associated with the incident.

Based on the absence of documented remediation activities and close proximity to the site, LUST No. 913213 constitutes a REC to the site.

Oxford Metal Inc

Oxford Metal Inc (addressed as 8316-8340 South Birkhoff Avenue) was identified as a RCRA-VSQG facility, located on the north adjacent property in a hydrogeologically down-gradient position relative to the site. According to the regulatory database report, in at least 1994 the business generated lead and wastewater treatment sludges from the manufacturing, formulation, and loading of lead-based initiating compounds. RCRA violations were not reported at the facility. Based on the non-corrective action regulatory status, the listing is not considered a REC to the site.

Putnam Bros.

Putnam Bros. (addressed as 8256-8258 Emerald Avenue) was identified as a Historical Auto Station, located approximately 300 feet west in a hydrogeologically cross-gradient position relative to the site. According to the regulatory database report, the facility operated as automobile repairing in 1923. Additional listings for the facility were not identified. Based on the non-corrective action regulatory status and distance from the site, the listing does not constitute a REC.

Remaining Facilities

Remaining listed facilities do not constitute RECs at this time based upon a minimum distance of approximately 300 feet from the site, facility information, regulatory status, or topographic gradient relative to the site.

Unmapped facilities are those that do not contain sufficient address or location information to evaluate the facility listing locations relative to the site. The report did not list facilities in the unmapped section.

4.2 Freedom of Information Act (FOIA) Requests and Significant Findings

4.2.1 City of Chicago

The City of Chicago Department of Public Health Environmental Records, were reviewed online.

- Compliant records were identified for the following addresses: 712 and 740 West 83rd Street.
- Demolition notices were identified for 717 West 83rd Street.
- Environmental inspection records were identified for *650 West 83rd Street (the site)*, 639 West 83rd Street, 717 West 83rd Street, 740 West 83rd Street; 8211 South Wallace Street, 8219 South Wallace Street, and 8300 South Wallace Street.
    - The environmental inspection record for the site indicated a representative from the CDPH observed approximately 500 waste tires, 100 cubic yards of landscape waste, and approximately 1,000 cubic

yards of mixed tire, plastic, and general litter on-site. The inspection was conducted on November 28, 2012.

- UST permits were identified for 653 West 83rd Street and 8201 South Wallace Street.
  - The UST records for 653 West 83rd Street indicated the facility contained three USTs: a 6,000-gallon UST installed in 1969 and a 500-gallon UST installed in 1954. The USTs were removed on December 13, 1985. Additional information was not available.
  - The UST records for 8201 South Wallace Street indicated the facility contained a 6,000-gallon toluene UST and a 6,000-gallon methyl ethyl ketone UST installed in 1962; a 4,000-gallon UST with unreported installation date; a 1,000-gallon fuel oil UST installed in 1953; and five 12,000-gallon fuel oil USTs installed in 1952. Dates of removal were not reported. The USTs were not registered with the OSFM and were not identified in the regulatory database report. Based on the unknown status (i.e. removed, still in use, abandoned in place, etc.), close proximity and apparent hydrogeologic up-gradient position to the site, the USTs constitute a REC to the site.

Additionally, records were requested from the City of Chicago Fire Department and City of Chicago Department of Buildings regarding potential USTs, above ground storage tanks (ASTs), spills, or other environmental concerns for the site. Information was not available for the site from the City of Chicago Fire Department. The City of Chicago Department of Buildings provided a building permit for new construction from 2019 for the site and an electrical permit for the site auto pound from 1997.

4.2.2 IEPA

Records were requested from the IEPA regarding the site. Terracon queried the IEPA Document Explorer for records pertaining to the site. SRP records for the site are discussed further in Section 3.6.

4.2.3 Office of the State Fire Marshal

The OSFM was contacted via web request regarding information for the site. Information was not available for the site. Terracon queried the OSFM online UST database for site listings. The site was not identified as a UST facility on the OSFM UST database.

4.3 Interviews

Terracon spoke with Mr. Jason Feldman with Green Era Educational NFP. Mr. Feldman was not very familiar with the background or history of the site but stated that Green Era Educational NFP took ownership in December of 2015.

5.0 PROPERTY INSPECTION

5.1 Property Reconnaissance

Information contained in this section is based on a visual reconnaissance conducted while walking around the interior and exterior of the site on March 3, 2020. The site was observed to be a vacant lot surrounded by a locked enclosure and gate. Dense vegetation was observed along the east, north, and west enclosure boundaries. Exhibit 2 is a diagram of the site and adjoining properties. Photo documentation of the site at the time of the visual reconnaissance is provided in Appendix E – Photographs.

5.1.1 Hazardous/Petroleum Products

Indications of hazardous materials and/or petroleum products were not observed on-site during the site reconnaissance.

5.1.2 Tanks/Vents/Fill Pipes

Indications of UST systems, vent/pill pipes, or similar features were not observed on-site during the site reconnaissance.

5.1.3 Building Foundations

Terracon did not observe remnants of the former building walls and foundations during the reconnaissance.

5.1.4 Odors/Staining, etc.

Obvious visual evidence of staining or odors was not observed on the surface of the site during the reconnaissance.

5.1.5 Drums/Other Containers

Drums and/or other containers were not observed on-site, except for multiple solid waste and recycling dumpsters located in the northeast portion of the site on the exterior of the enclosure.

5.1.6 Debris

Fly dumping was observed at the site, which included crushed concrete and stone located on the northwest portion of the site, mulch located on the southeast portion of the site, as well as dirt, gravel, concrete, and shredded plastic located on the northeast portion of the site, on the exterior of the locked enclosure. Numerous solid waste and recycling

dumpsters were also observed in the northeast portion of the site, on the exterior of the locked enclosure.

5.1.7 Asbestos-Containing Material

An asbestos-containing material inspection was outside the scope of this Phase I ESA. No permanent structures are currently located on site; however there is a potential that ACM from former structures may be buried on site.

5.1.8 Transformers

Pad or pole-mounted transformers were not observed on-site.

5.1.9 Stressed Vegetation

Evidence of stressed vegetation was not observed on-site.

5.1.10 Other Notable Features

A fenced area was observed in the center of the site; however, its purpose is unknown. An approximately 100,000-gallon iron water tower was observed on the north side of the site.

5.2 Adjacent Properties Reconnaissance

Observations described in the following subsections were made from public vantage points surrounding the site.

5.2.1 Hazardous/Petroleum Products

Indications of hazardous or petroleum products on adjoining properties were not observed; however, the adjoining properties are discussed in Section 4.1 – Federal and State / Tribal Databases.

5.2.2 Tanks/Vents/Fill Pipes

Indications of UST systems, vent/fill pipes or associated features were not observed on adjoining properties.

5.2.3 Building Foundations

Indications of building foundations were not observed on adjoining properties.

5.2.4 Odors/Staining, etc.

Evidence of staining was not observed on the surface of the adjoining properties during the reconnaissance. Unusual odors were not noted during the site reconnaissance.

5.2.5 Drums/Other Containers

Drums and/or other containers were not observed on adjoining properties.

5.2.6 Debris

Debris was not observed on adjoining properties.

5.2.7 Transformers

Indications of leaks from transformers were not observed on the adjacent properties during the field reconnaissance.

5.2.8 Stressed Vegetation

Stressed vegetation was not observed on adjacent properties during the field reconnaissance.

5.2.9 Other Notable Features

Other notable features were not observed during the adjoining property reconnaissance.

5.3 Building Inspection

The site was not developed with buildings at the time of the Terracon site reconnaissance; hence, interior inspections were not conducted.

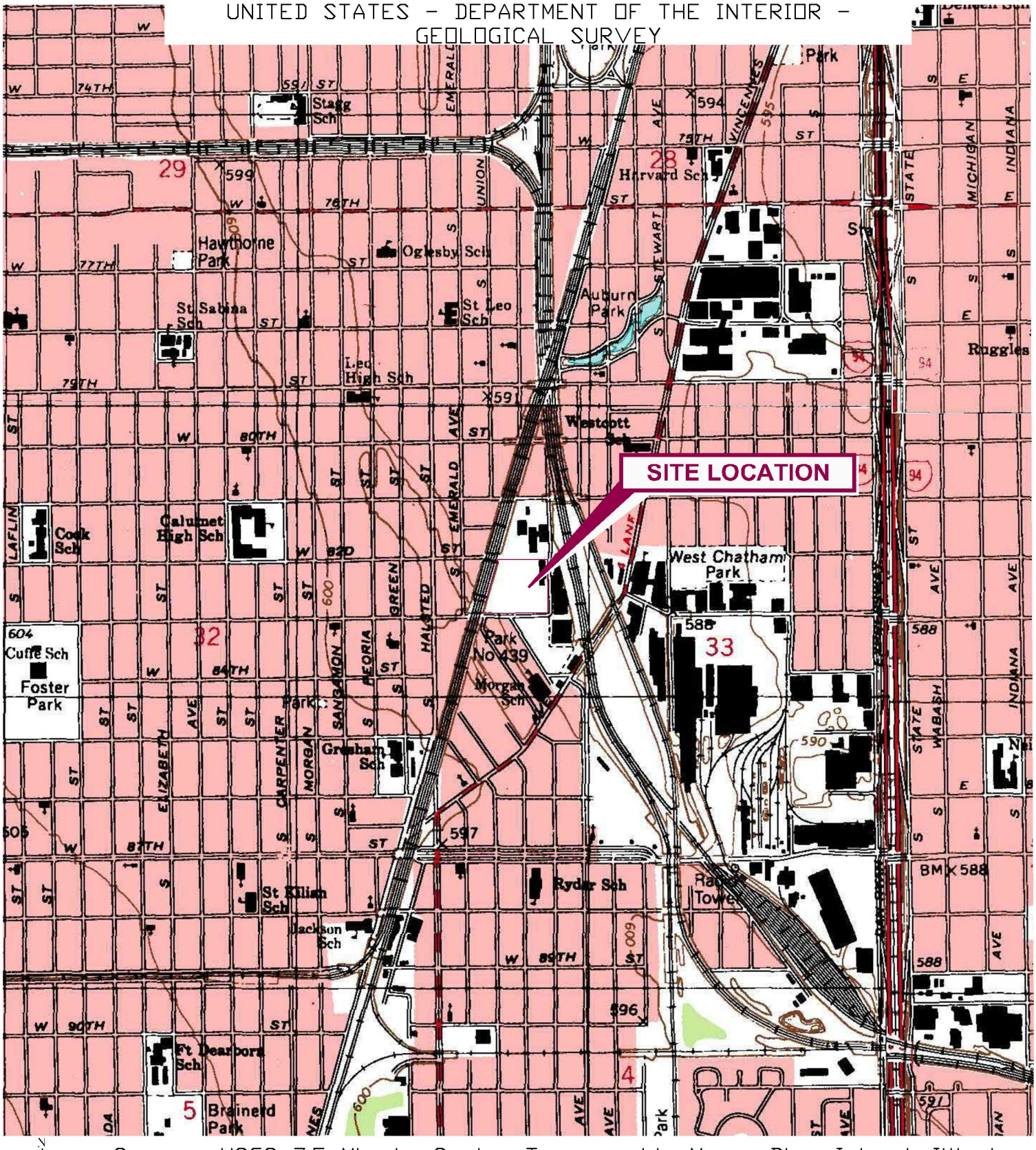
6.0 Declaration

I, Rachelle K. Christian, declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in Section 312.10 of 40 CFR 312; and I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the site. I have developed and performed the All Appropriate Inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

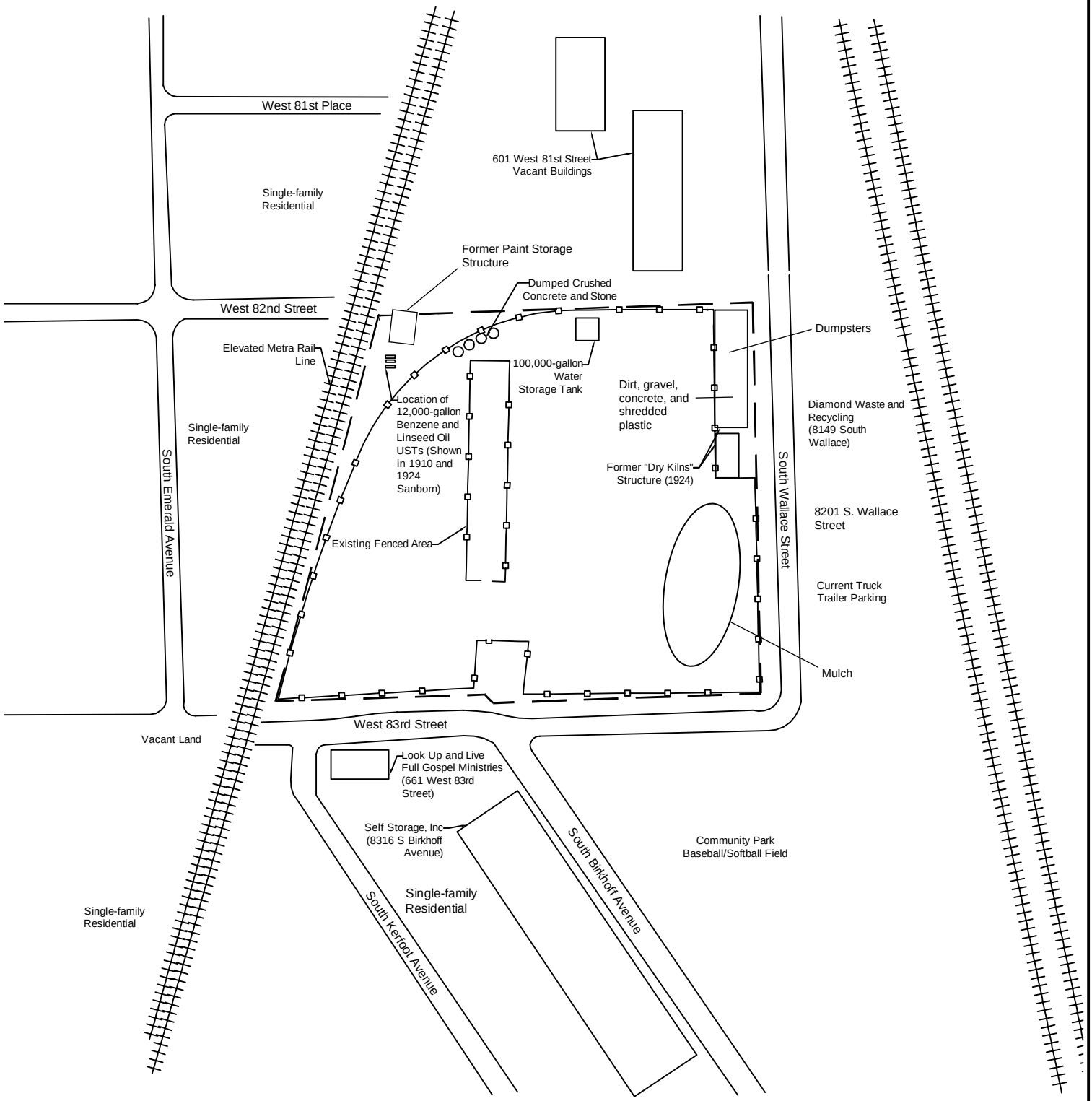
_____

Rachelle K. Christian
Department Manager

Appendices



Project Mngr: CH	Project No. 11207060	Terracon Consulting Engineers and Scientists	TOPOGRAPHIC VICINITY MAP
Drawn By: CH	Scale: AS-SHOWN		PHASE I ENVIRONMENTAL SITE ASSESSMENT 650 WEST 83RD STREET CHICAGO, ILLINOIS
Checked By: RC	Revised By: ~		EXHIBIT 1
Approved By: RC	Date: 3/2020		



Project Mngr:	CH
Drawn By:	CH
Checked By:	RC
Approved By:	RC
Project No.	11207060
Scale:	AS-SHOWN
Revised By:	~
Date:	3/2020

Terracon
Consulting Engineers and Scientists

SITE FEATURE MAP

PHASE I ENVIRONMENTAL SITE ASSESSMENT
650 WEST 83RD STREET
CHICAGO, ILLINOIS

EXHIBIT
2

APPENDIX A

Aerial Photographs


INQUIRY #: 3624052.5
YEAR: 1938
= 500'
N


INQUIRY #: 3624052.5
YEAR: 1952
= 500'
N


INQUIRY #: 3624052.5
YEAR: 1962
= 500'
N


INQUIRY #: 3624052.5
YEAR: 1964
= 500'
N

INQUIRY #: 3624052.5

YEAR: 1972

= 750'

N


INQUIRY #: 3624052.5
YEAR: 1978
= 500'
N


INQUIRY #: 3624052.5
YEAR: 1984
= 500'
N


INQUIRY #: 3624052.5
YEAR: 1988
= 750'
N

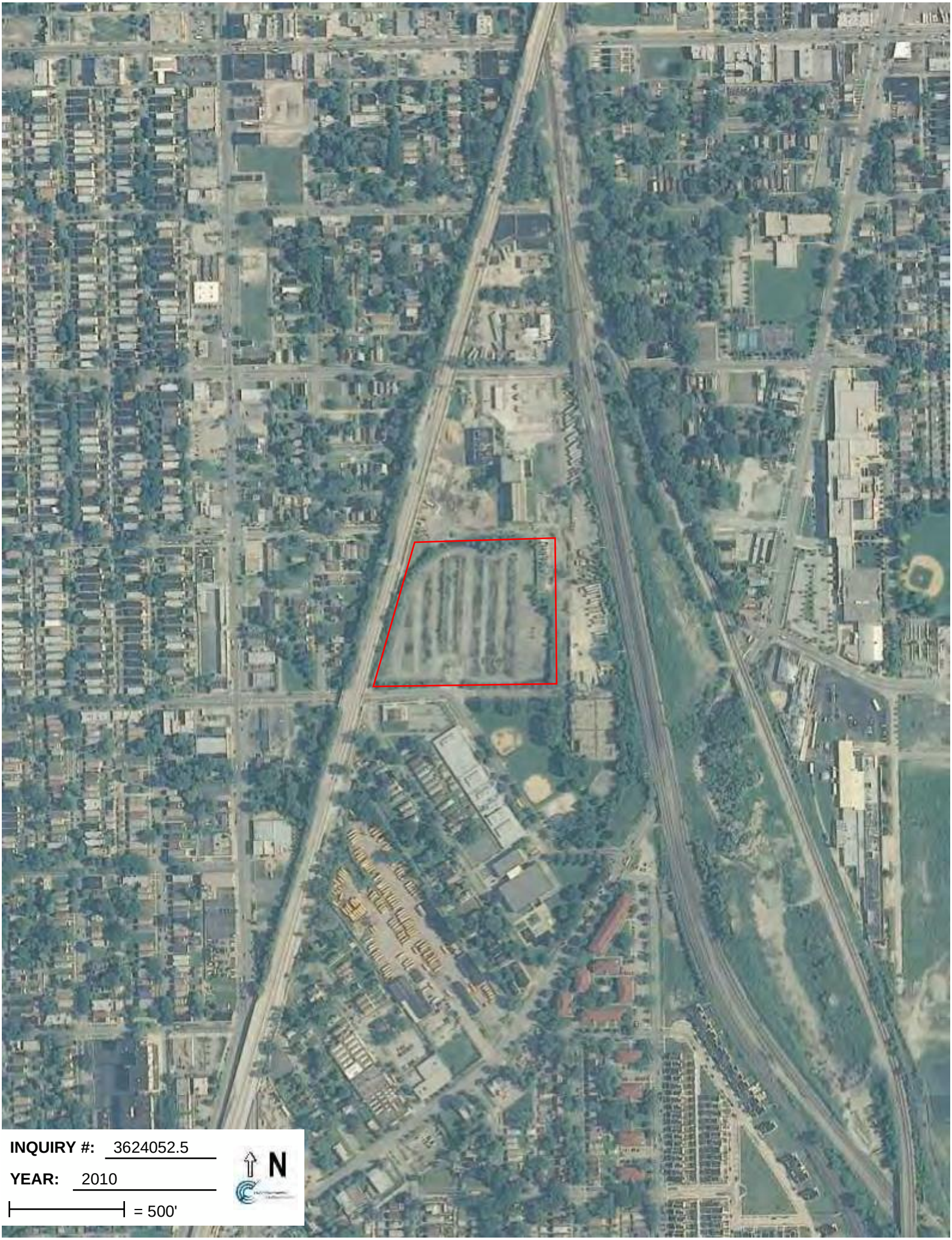

INQUIRY #: 3624052.5
YEAR: 1994
= 750'
N


INQUIRY #: 3624052.5
YEAR: 1999
= 500'
N


INQUIRY #: 3624052.5
YEAR: 2005
= 500'
N


INQUIRY #: 3624052.5
YEAR: 2007
= 500'
N


INQUIRY #: 3624052.5
YEAR: 2009
= 500'
N

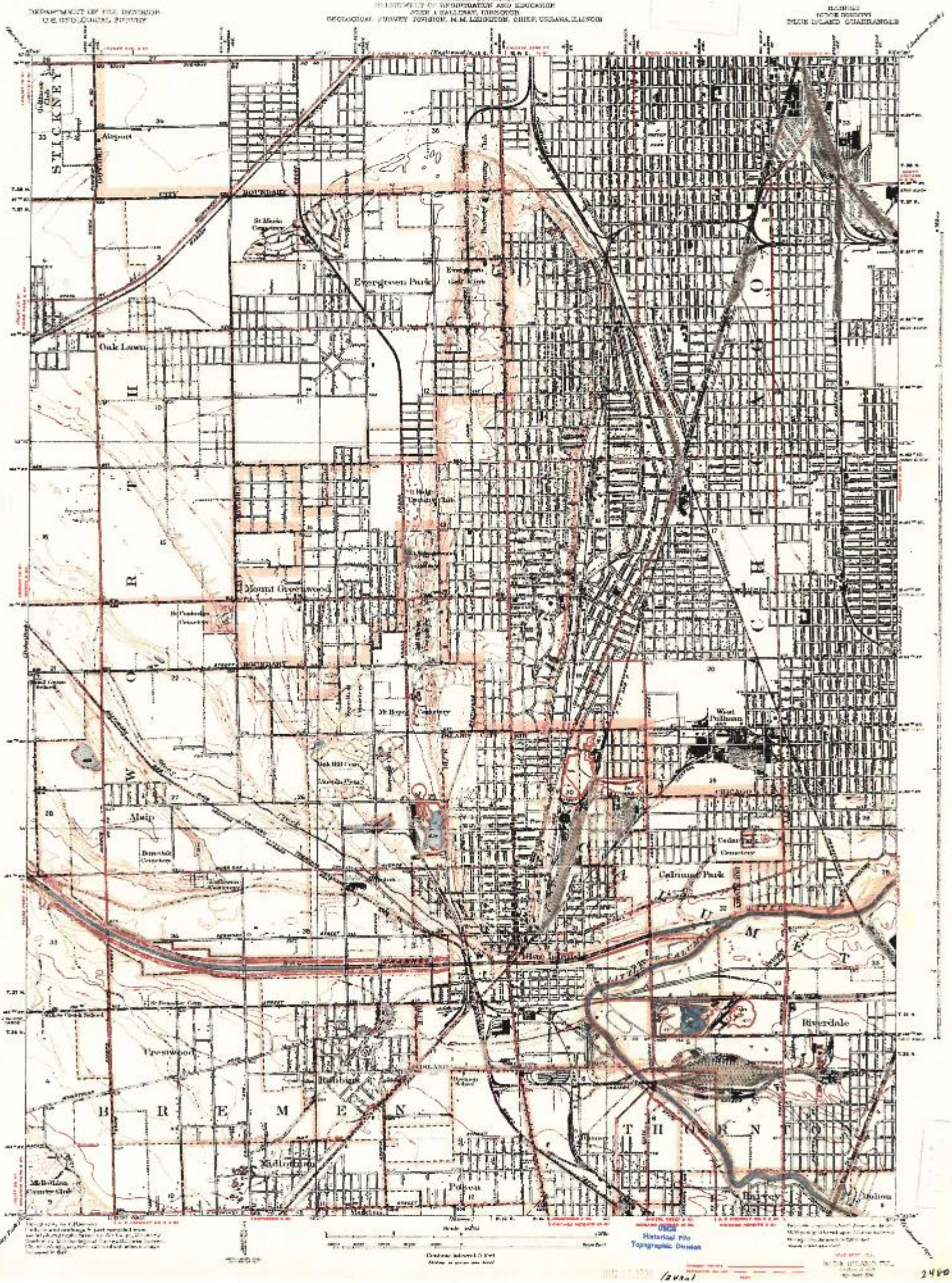

INQUIRY #: 3624052.5
YEAR: 2010
= 500'
N

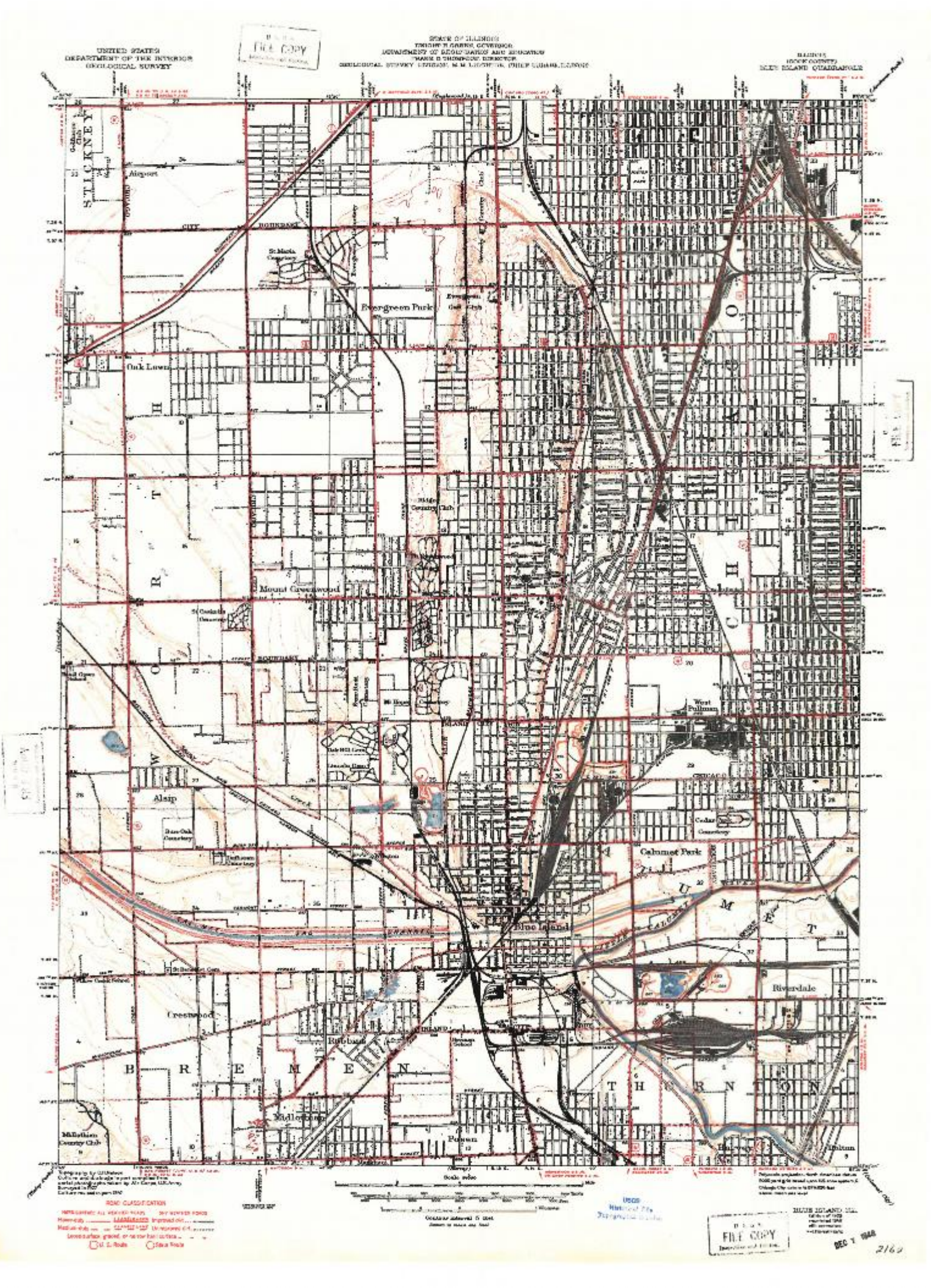

INQUIRY #: 3624052.5
YEAR: 2011
= 500'
N


INQUIRY #: 3624052.5
YEAR: 2012
= 500'
N

APPENDIX B

Topographic Maps

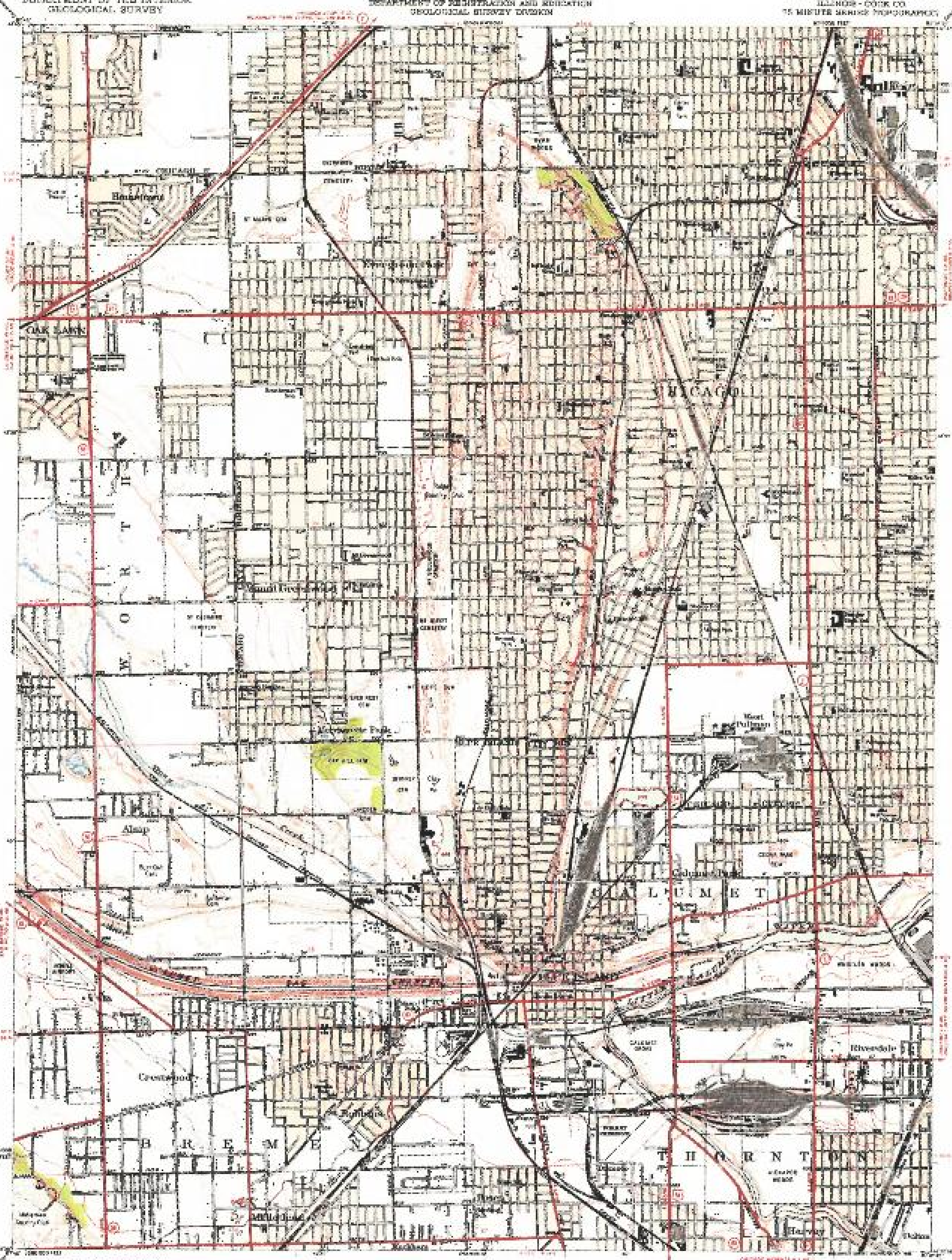

STICKNEY
Oak Lawn
Evergreen Park
Mount Greenwood
Worth
Alsip
Blue Island
Crestwood
Robbins
Midlothian
Posen
Calumet Park
Riverdale
Harvey
Dolton
West Pullman
CHICAGO
BREMEN
THORNTON
USGS
Historical File
Topographic Division


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
STATE OF ILLINOIS
WILLIAM G. STRATTON, GOVERNOR
DEPARTMENT OF REGISTRATION AND EDUCATION
FRANK G. THOMPSON, DIRECTOR
GEOLOGICAL SURVEY DIVISION, M. M. LEIGHTON, CHIEF URBANA, ILLINOIS
ILLINOIS
COOK COUNTY
BLUE ISLAND QUADRANGLE
STICKNEY
Oak Lawn
Evergreen Park
Mount Greenwood
Alsip
West Pullman
Calumet Park
Blue Island
Riverdale
Crestwood
Robbins
Midlothian
Country Club
Posen
Hazelgreen
Ashburn
BREMEN
TOWNSHIP
Scale miles
ROAD CLASSIFICATION
U. S. Route
State Route
USGS
Historical File
Topographic Division
FILE COPY
DEC 7 1948
2162

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF ILLINOIS
DEPARTMENT OF REGISTRATION AND EDUCATION
GEOLOGICAL SURVEY DIVISION

BLUE ISLAND QUADRANGLE
ILLINOIS - COOK CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey
Control by USGS, USC&GS and City of Chicago

SCALE 1:24000

CONTOUR INTERVAL 5 FEET
DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON 25, D. C.
AND BY THE STATE GEOLOGICAL SURVEY, URBANA, ILLINOIS

USGS
Historical File
Topographic Division

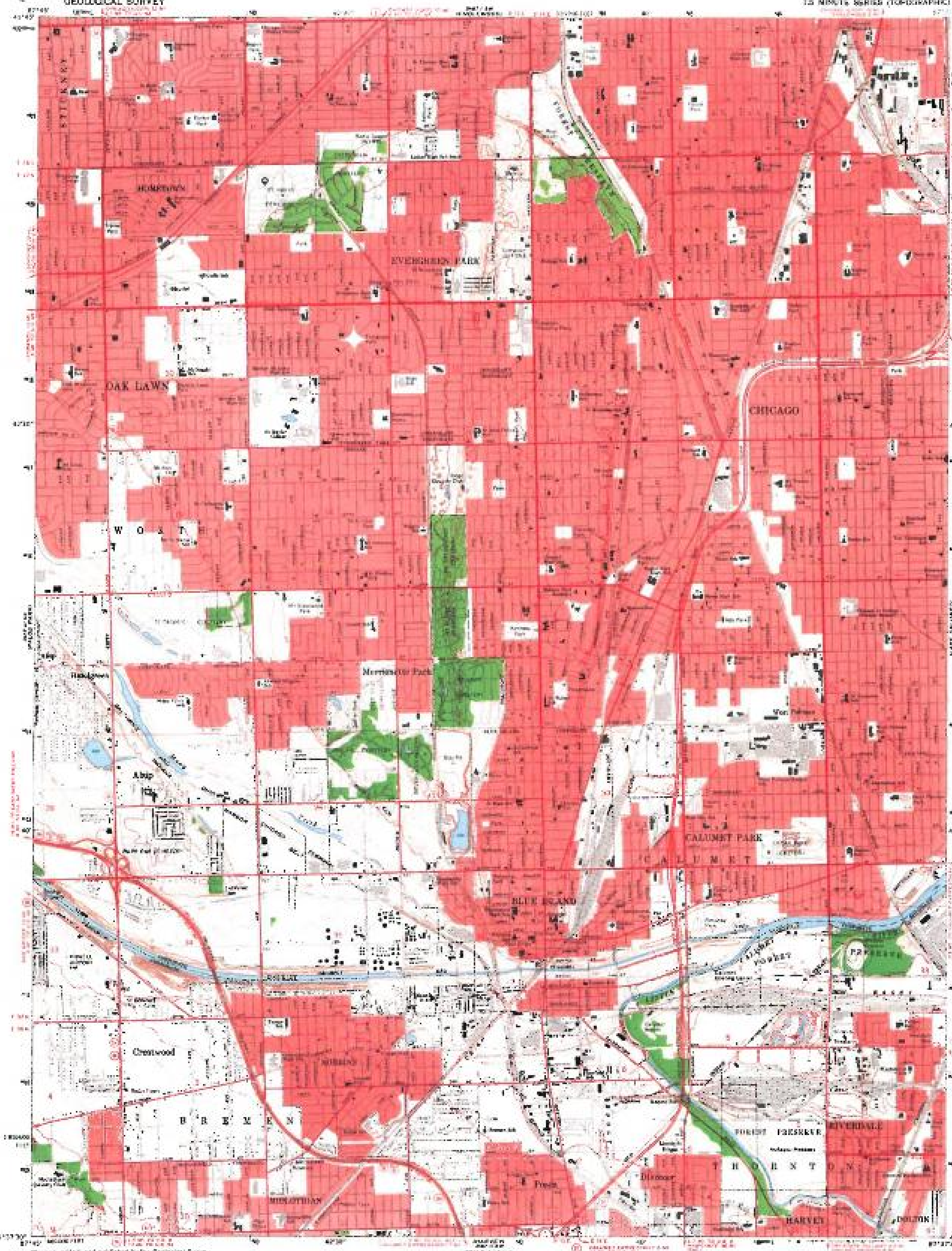
ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
U. S. Route
State Route

BLUE ISLAND, ILL.

1953

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

BLUE ISLAND QUADRANGLE
ILLINOIS–COOK CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey
in cooperation with State of Illinois Geological Survey

Control by USGS, USC&GS, City of Chicago
and Cook County Highway Department

Planimetry by photogrammetric methods from aerial photographs
taken 1962–63. Topography by planetable surveys 1927. Revised 1963

Polyconic projection. 1927 North American datum
10,000-foot grid based on Illinois coordinate system, east zone
1000-meter Universal Transverse Mercator grid ticks,
zone 16, shown in blue

Red tint indicates areas in which only landmark buildings are shown

Fine red dashed lines indicate selected fence and field lines where
generally visible on aerial photographs. This information is unchecked

SCALE 1:24000

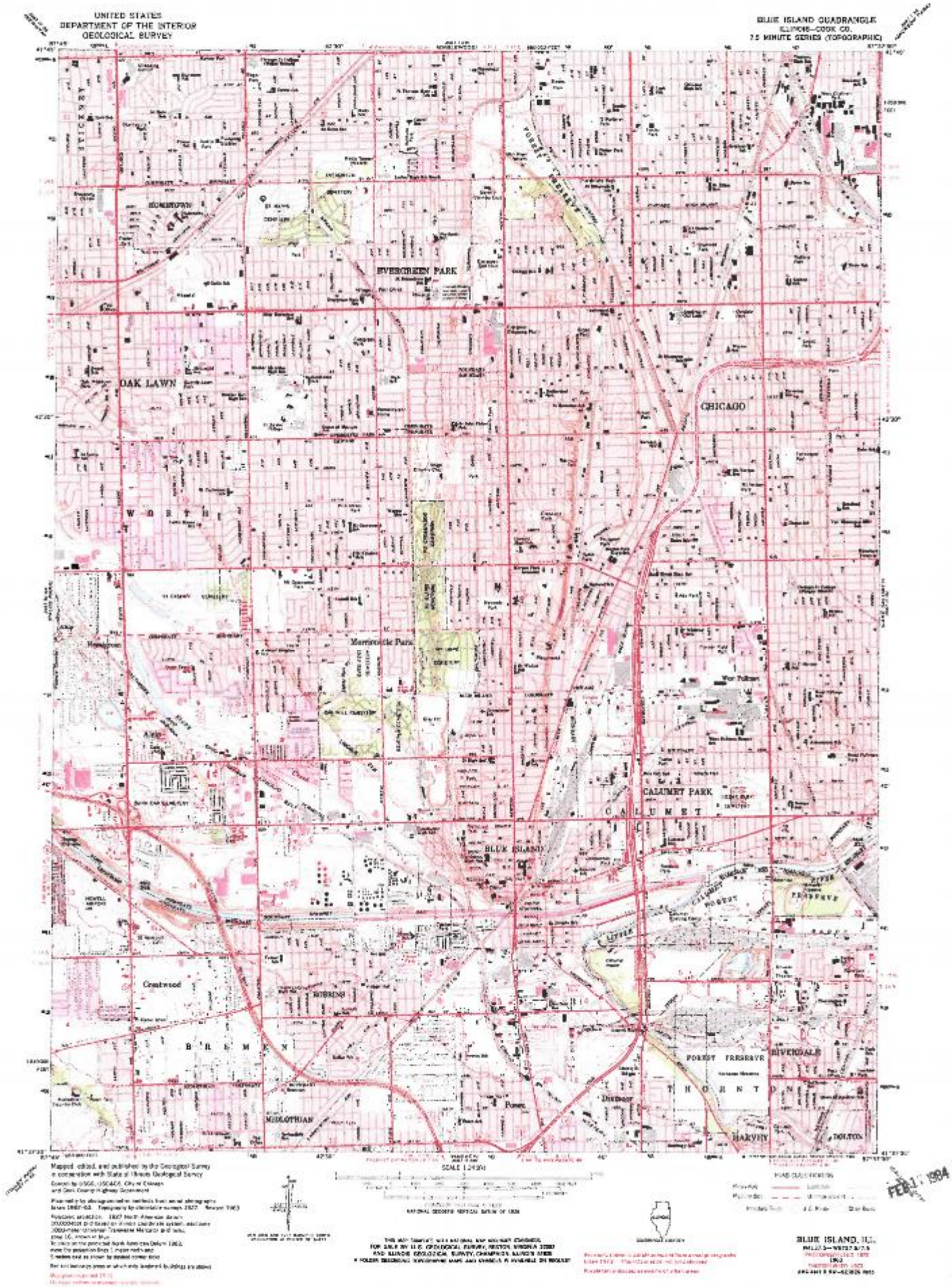
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, WASHINGTON 25, D.C.
AND BY THE STATE GEOLOGICAL SURVEY, URBANA, ILLINOIS
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

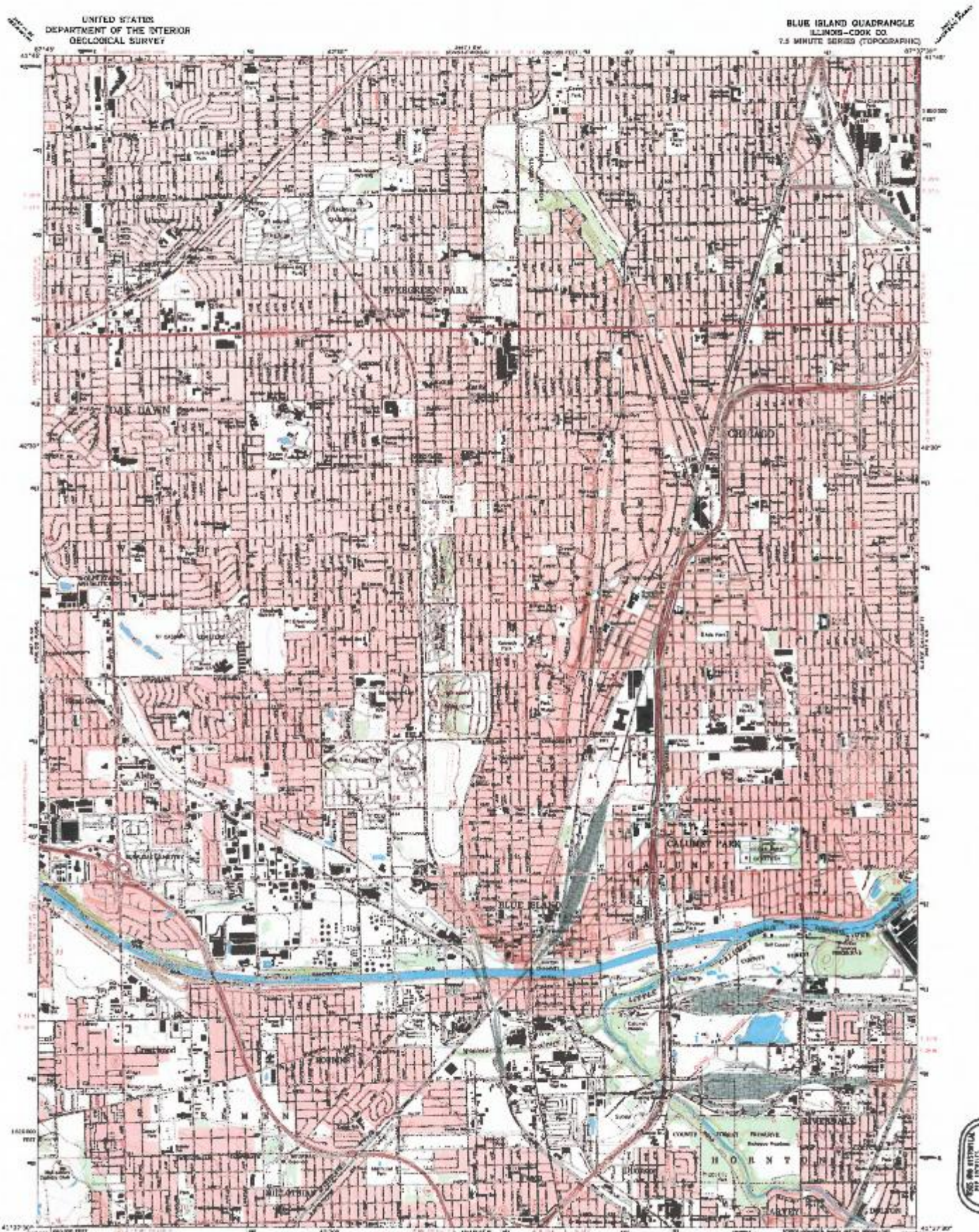
ROAD CLASSIFICATION

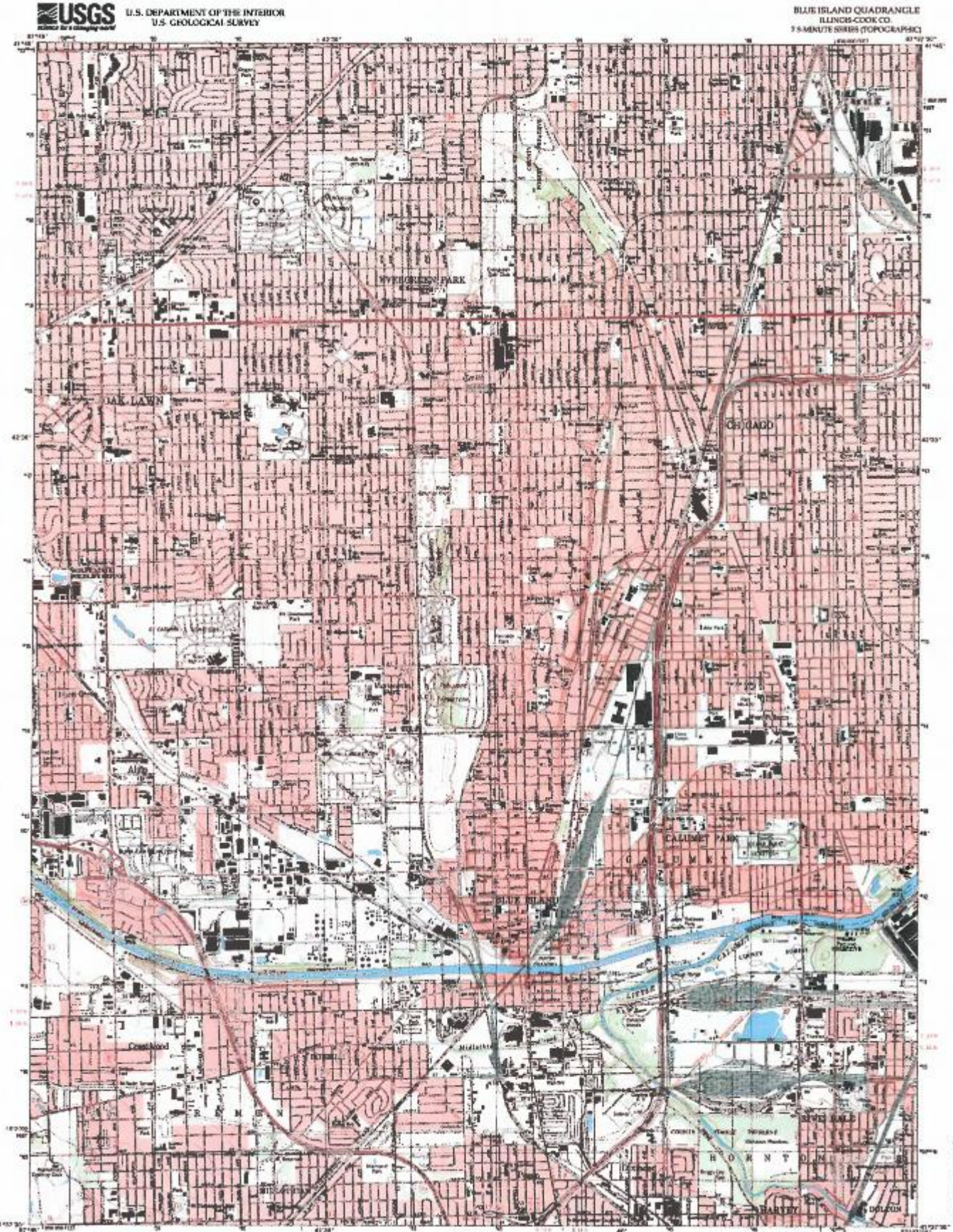
Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
Interstate Route — U.S. Route — State Route

BLUE ISLAND, ILL.

1963


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
BLUE ISLAND QUADRANGLE
ILLINOIS—COOK CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
EVERGREEN PARK
OAK LAWN
CHICAGO
W O R T H
Merrionette Park
CALUMET PARK
C A L U M E T
BLUE ISLAND
Crestwood
ROBBINS
B R E M E N
MIDLOTHIAN
FOREST PRESERVE
RIVERDALE
T H O R N T O N
HARVEY
DOLTON
SCALE 1:24000
FEB 1 1984

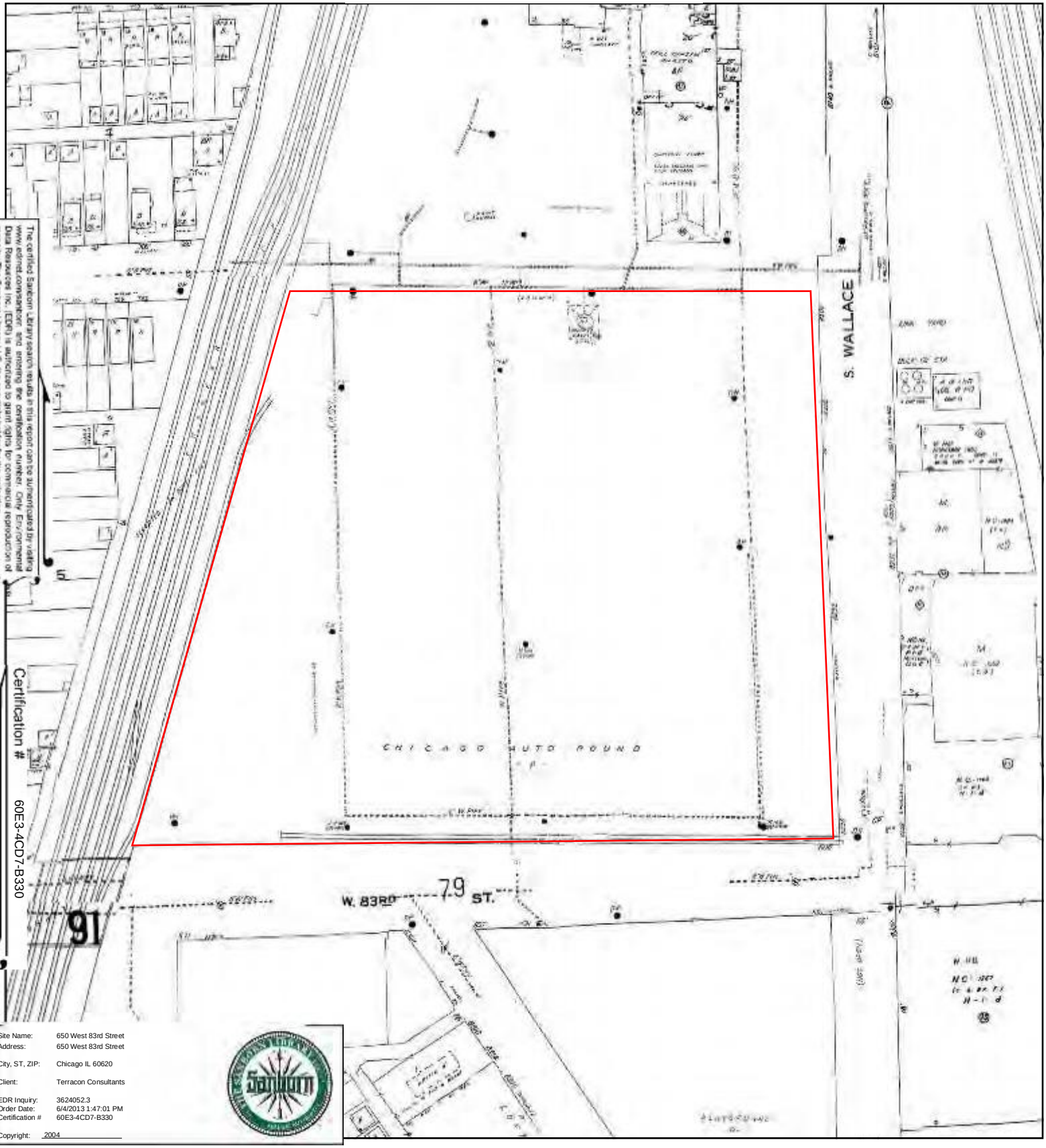

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
BLUE ISLAND QUADRANGLE
ILLINOIS—COOK CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
EVERGREEN PARK
OAK LAWN
OAKWOOD
CALUMET PARK
BLUE ISLAND
RIVERDALE
HORNTON
Produced by the United States Geological Survey
in cooperation with State of Illinois Geological Survey
ROAD CLASSIFICATION
BLUE ISLAND, ILL.
1993



APPENDIX C

Sanborn Maps

2004 Certified Sanborn Map

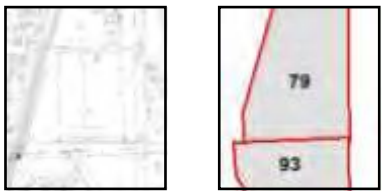


The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn, and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by The Sanborn Library LLC, the copyright holder for the collection.

Certification # 60E3-4CD7-B330

Site Name: 650 West 83rd Street
Address: 650 West 83rd Street
City, ST, ZIP: Chicago IL 60620
Client: Terracon Consultants
EDR Inquiry: 3624052.3
Order Date: 6/4/2013 1:47:01 PM
Certification # 60E3-4CD7-B330
Copyright: 2004

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

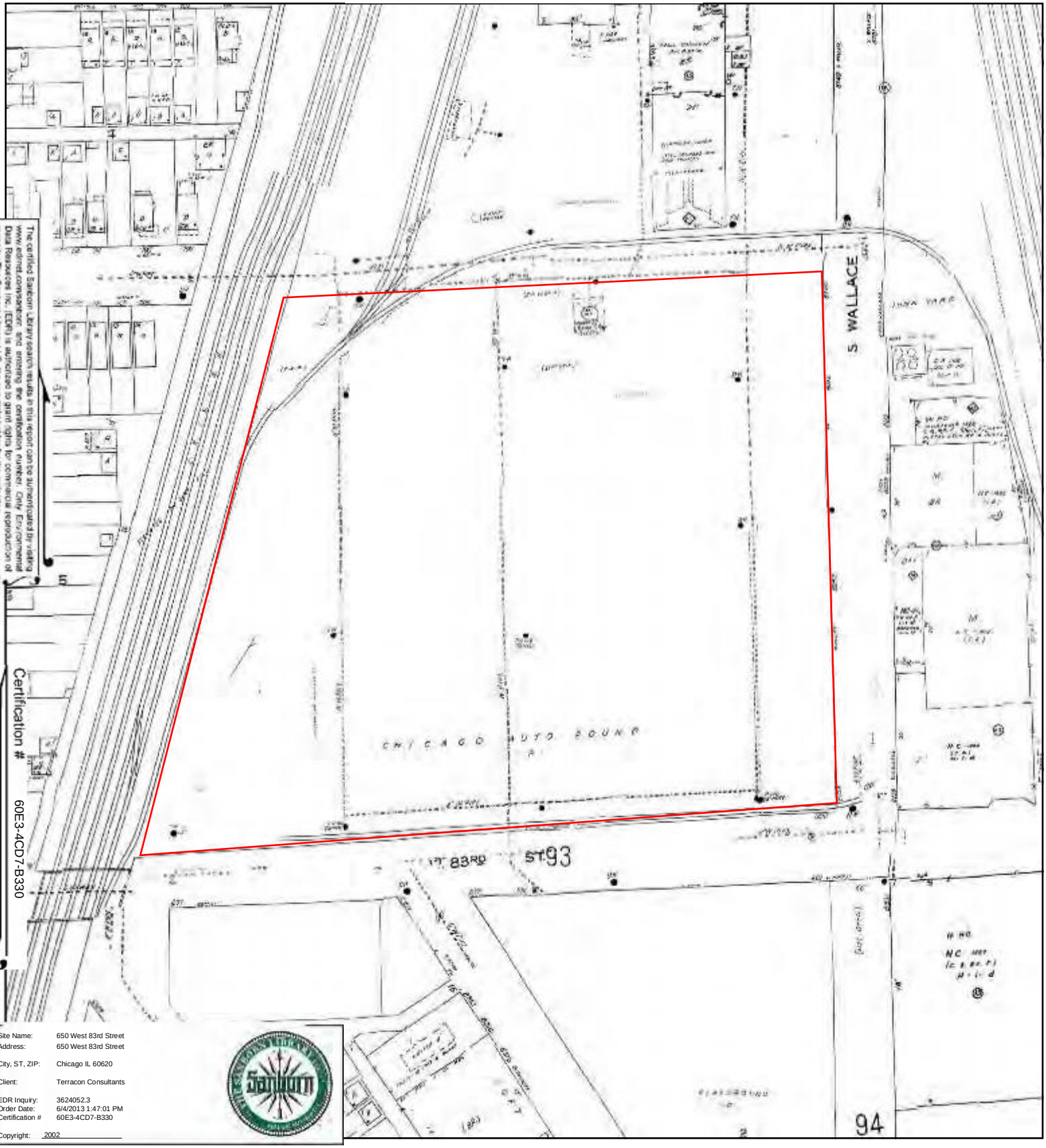


Volume 25, Sheet 79
Volume 25, Sheet 93

0 Feet 150 300 600

N

2002 Certified Sanborn Map

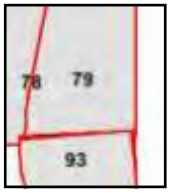


The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn, and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by The Sanborn Library LLC, the copyright holder for the collection.

Certification # 60E3-4CD7-B330

Site Name: 650 West 83rd Street
Address: 650 West 83rd Street
City, ST, ZIP: Chicago IL 60620
Client: Terracon Consultants
EDR Inquiry: 3624052.3
Order Date: 6/4/2013 1:47:01 PM
Certification # 60E3-4CD7-B330
Copyright: 2002

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

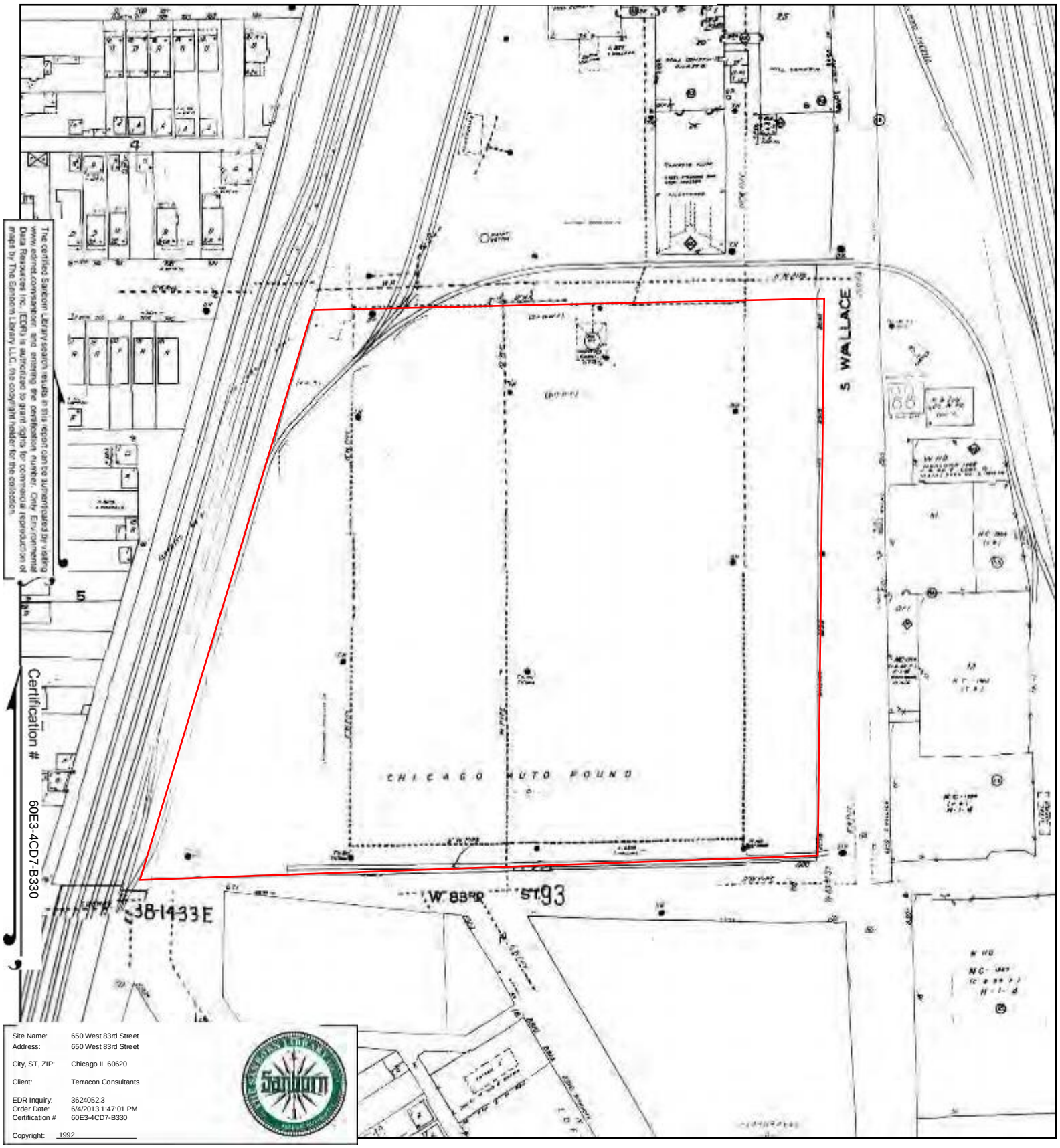


Volume 25, Sheet 78
Volume 25, Sheet 79
Volume 25, Sheet 93
Volume 25, Sheet 93

0 Feet 150 300 600

N

1992 Certified Sanborn Map



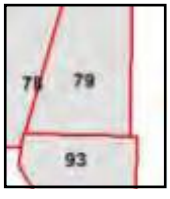
The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn, and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by The Sanborn Library LLC, the copyright holder for the collection.

Certification # 60E3-4CD7-B330

Site Name:	650 West 83rd Street
Address:	650 West 83rd Street
City, ST, ZIP:	Chicago IL 60620
Client:	Terracon Consultants
EDR Inquiry:	3624052.3
Order Date:	6/4/2013 1:47:01 PM
Certification #	60E3-4CD7-B330
Copyright:	1992

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

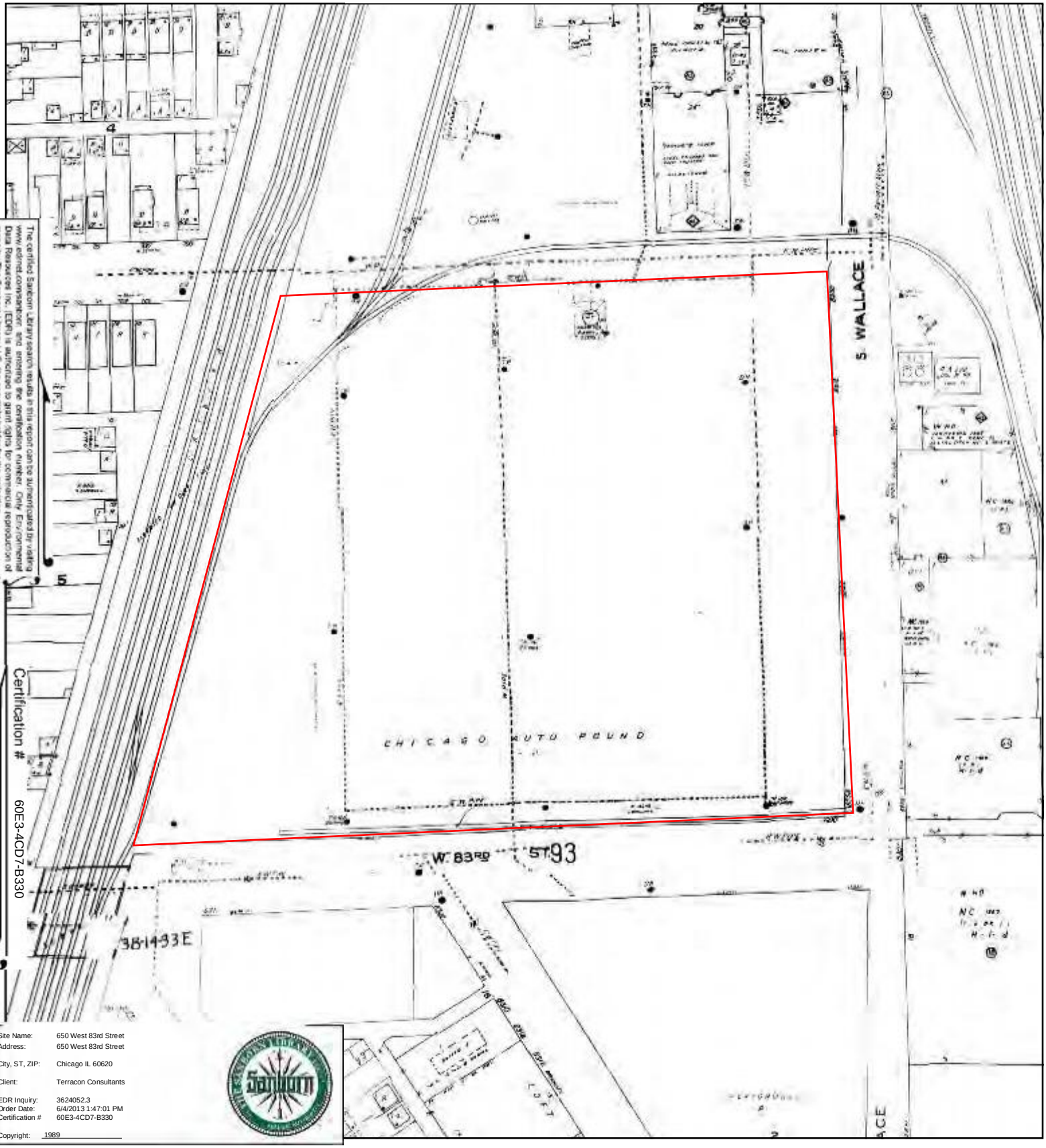
0 Feet 150 300 600



Volume 25, Sheet 78
Volume 25, Sheet 79
Volume 25, Sheet 93

N

1989 Certified Sanborn Map

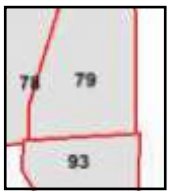


The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn, and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by The Sanborn Library LLC, the copyright holder for the collection.

Certification # 60E3-4CD7-B330

Site Name: 650 West 83rd Street
Address: 650 West 83rd Street
City, ST, ZIP: Chicago IL 60620
Client: Terracon Consultants
EDR Inquiry: 3624052.3
Order Date: 6/4/2013 1:47:01 PM
Certification # 60E3-4CD7-B330
Copyright: 1989

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

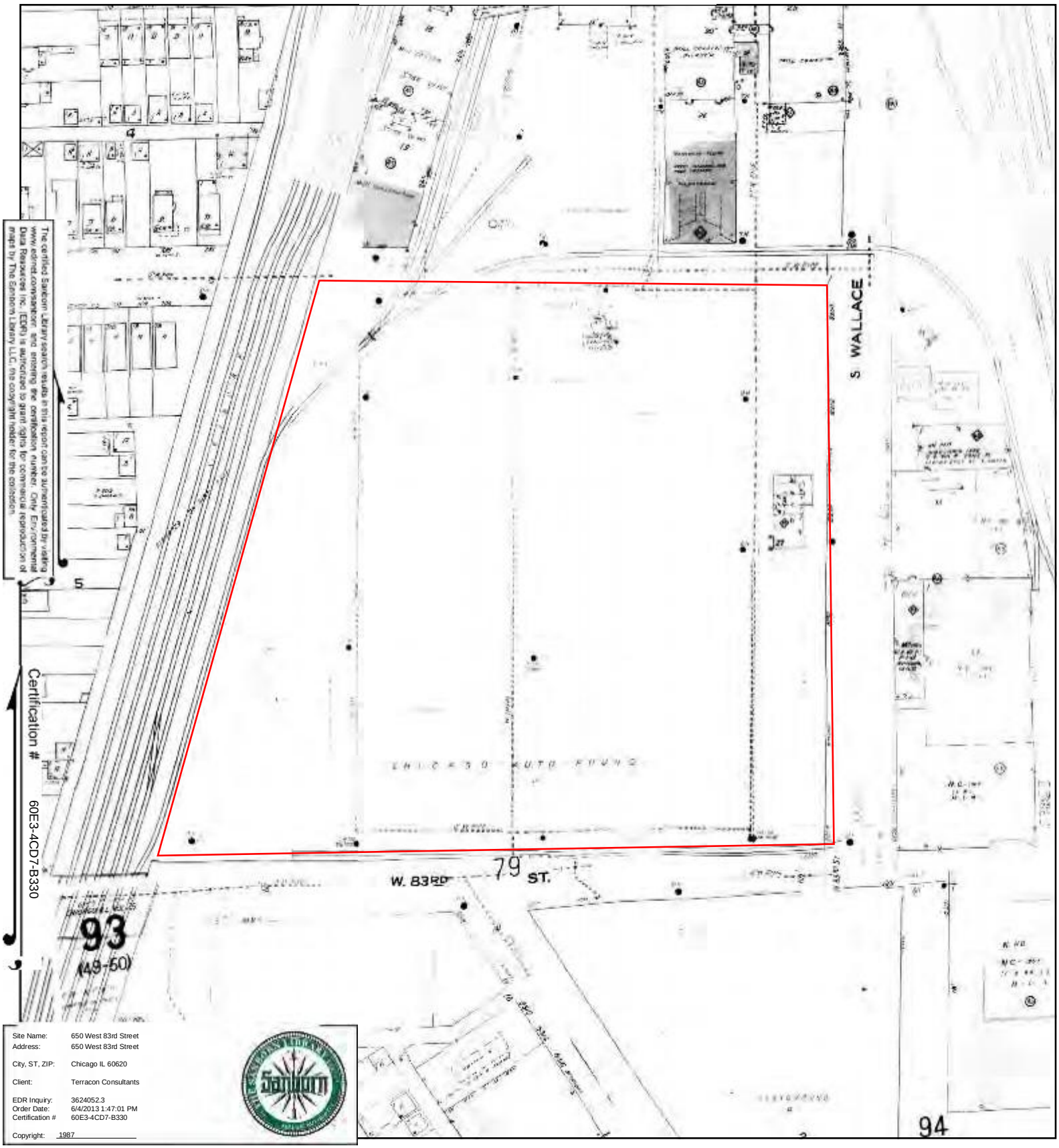


Volume 25, Sheet 78
Volume 25, Sheet 79
Volume 25, Sheet 93

0 Feet 150 300 600

N

1987 Certified Sanborn Map

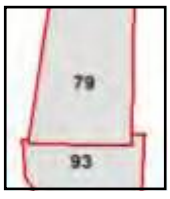


The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by The Sanborn Library LLC, the copyright holder for the collection.

Certification # 60E3-4CD7-B330

Site Name:	650 West 83rd Street
Address:	650 West 83rd Street
City, ST, ZIP:	Chicago IL 60620
Client:	Terracon Consultants
EDR Inquiry:	3624052.3
Order Date:	6/4/2013 1:47:01 PM
Certification #	60E3-4CD7-B330
Copyright:	1987

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

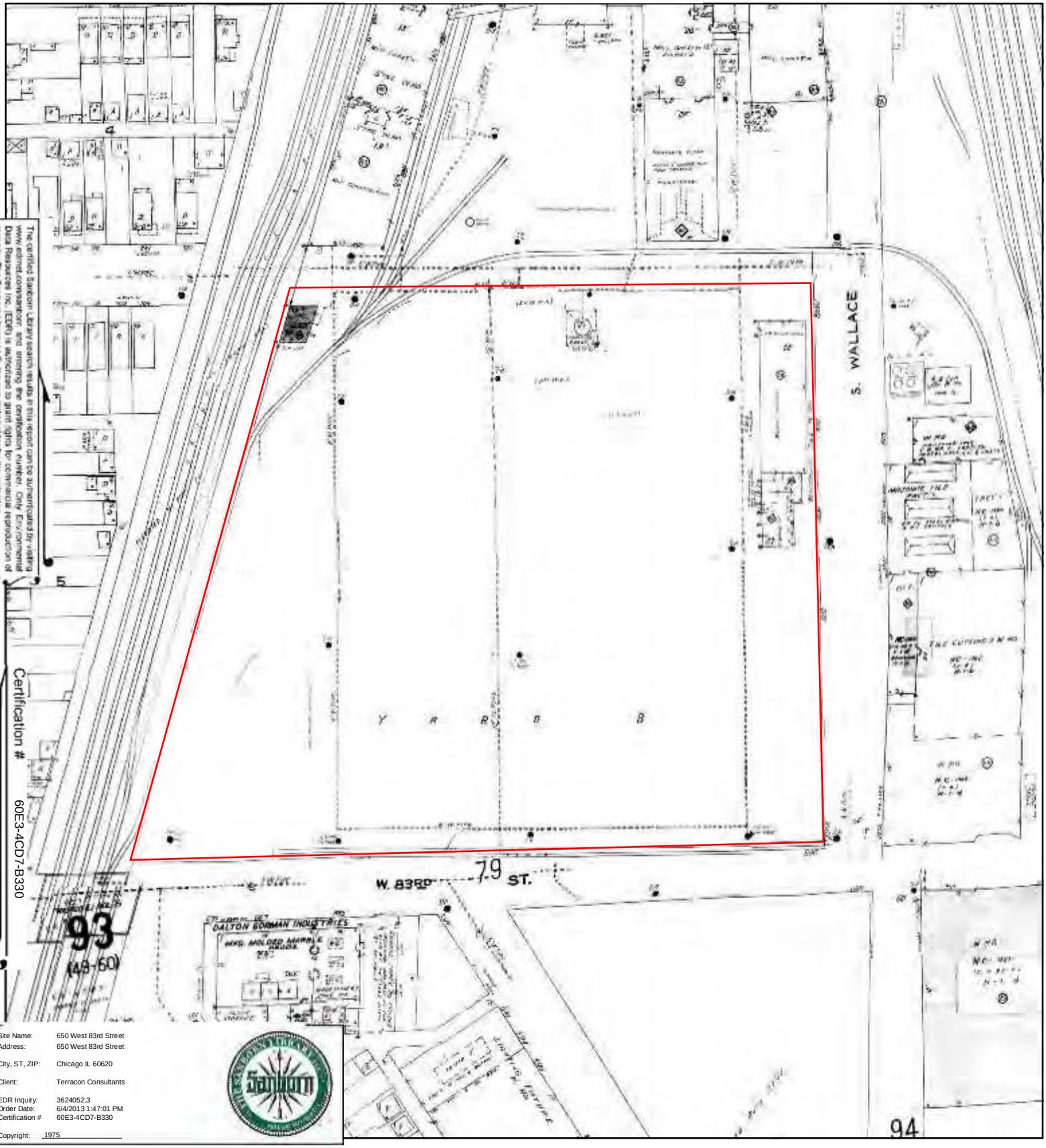


Volume 25, Sheet 93
Volume 25, Sheet 79

0 Feet 150 300 600

N

1975 Certified Sanborn Map



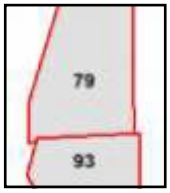
The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn, and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by The Sanborn Library LLC, the copyright holder for the collection.

Certification # 60E3-4CD7-B330

Site Name: 650 West 83rd Street
Address: 650 West 83rd Street
City, ST, ZIP: Chicago IL 60620
Client: Terracon Consultants
EDR Inquiry: 3624052.3
Order Date: 6/4/2013 1:47:01 PM
Certification # 60E3-4CD7-B330
Copyright: 1975

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

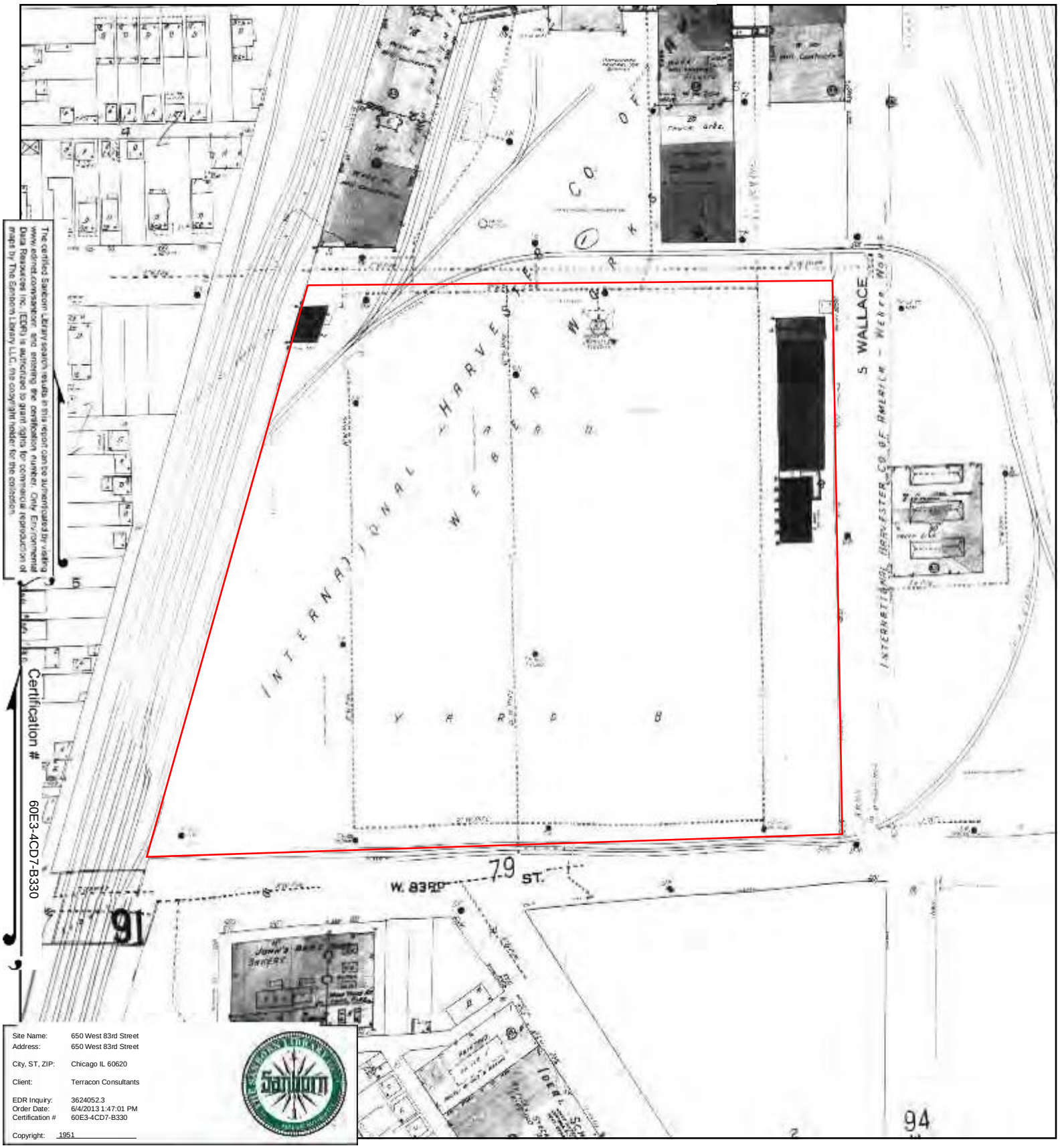
0 Feet 150 300 600



Volume 25, Sheet 79
Volume 25, Sheet 93

N

1951 Certified Sanborn Map



The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn, and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by The Sanborn Library LLC, the copyright holder for the collection.

Certification # 60E3-4CD7-B330

Site Name:	650 West 83rd Street
Address:	650 West 83rd Street
City, ST, ZIP:	Chicago IL 60620
Client:	Terracon Consultants
EDR Inquiry:	3624052.3
Order Date:	6/4/2013 1:47:01 PM
Certification #	60E3-4CD7-B330
Copyright:	1951

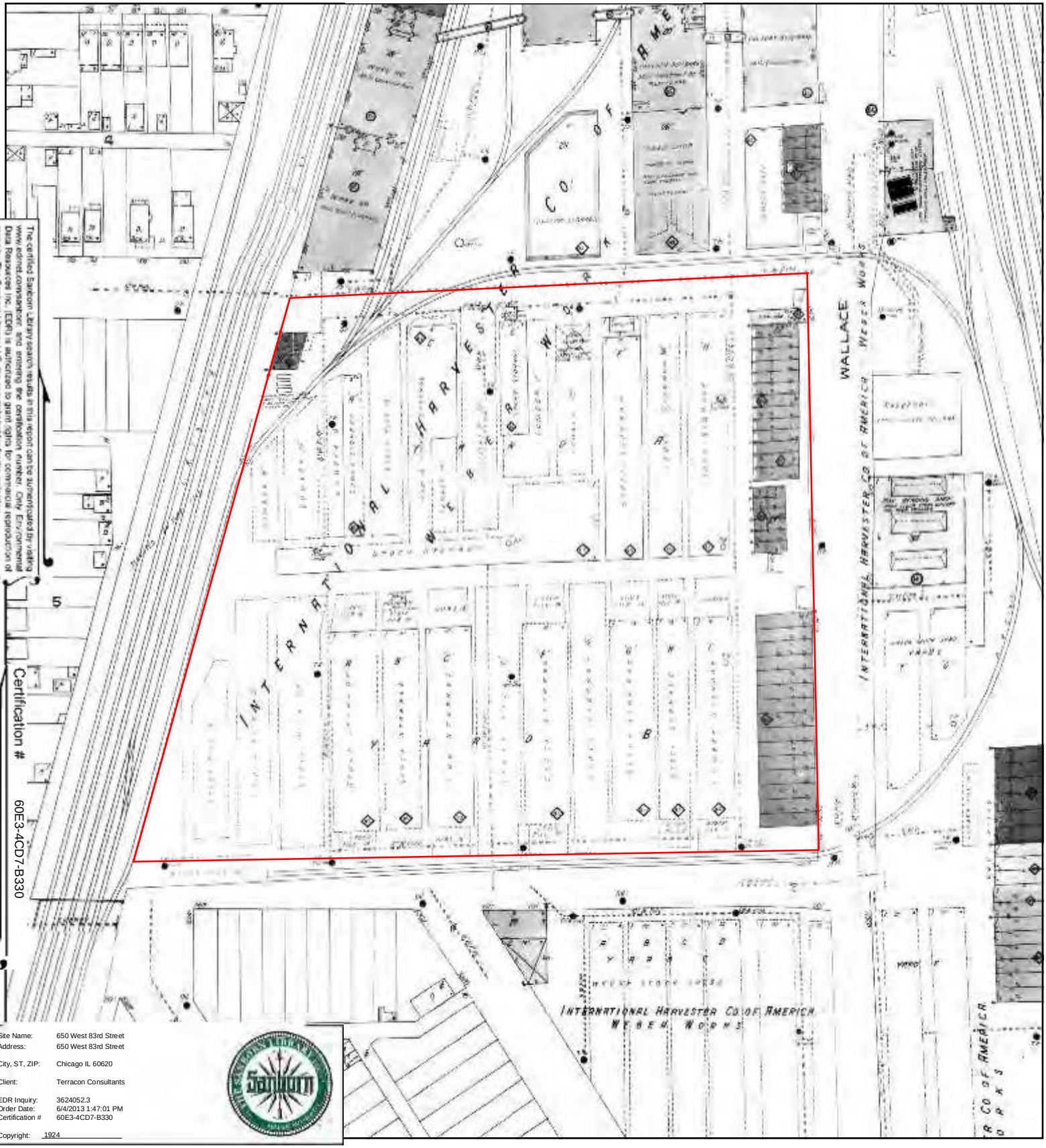
This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

Volume 25, Sheet 79
Volume 25, Sheet 93

0 Feet 150 300 600

N

1924 Certified Sanborn Map



The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn, and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by The Sanborn Library LLC, the copyright holder for the collection.

Certification # 60E3-4CD7-B330

Site Name:	650 West 83rd Street
Address:	650 West 83rd Street
City, ST, ZIP:	Chicago IL 60620
Client:	Terracon Consultants
EDR Inquiry:	3624052.3
Order Date:	6/4/2013 1:47:01 PM
Certification #	60E3-4CD7-B330
Copyright:	1924

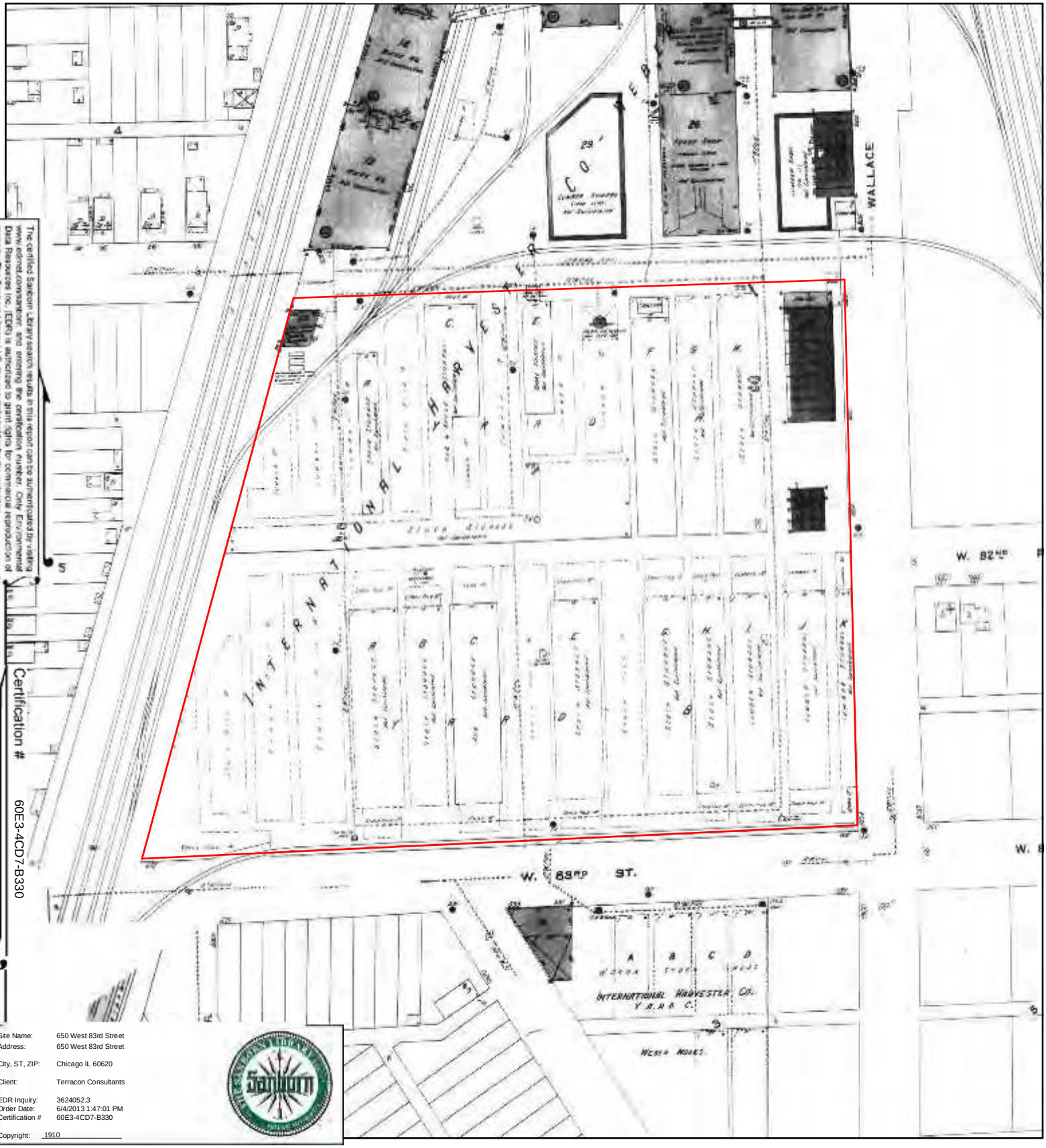
This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

0 Feet 150 300 600

Volume 25, Sheet 79
Volume 25, Sheet 93

N

1910 Certified Sanborn Map

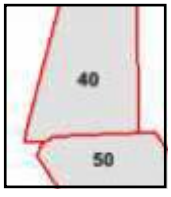


The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn, and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by The Sanborn Library LLC, the copyright holder for the collection.

Certification # 60E3-4CD7-B330

Site Name: 650 West 83rd Street
Address: 650 West 83rd Street
City, ST, ZIP: Chicago IL 60620
Client: Terracon Consultants
EDR Inquiry: 3624052.3
Order Date: 6/4/2013 1:47:01 PM
Certification # 60E3-4CD7-B330
Copyright: 1910

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

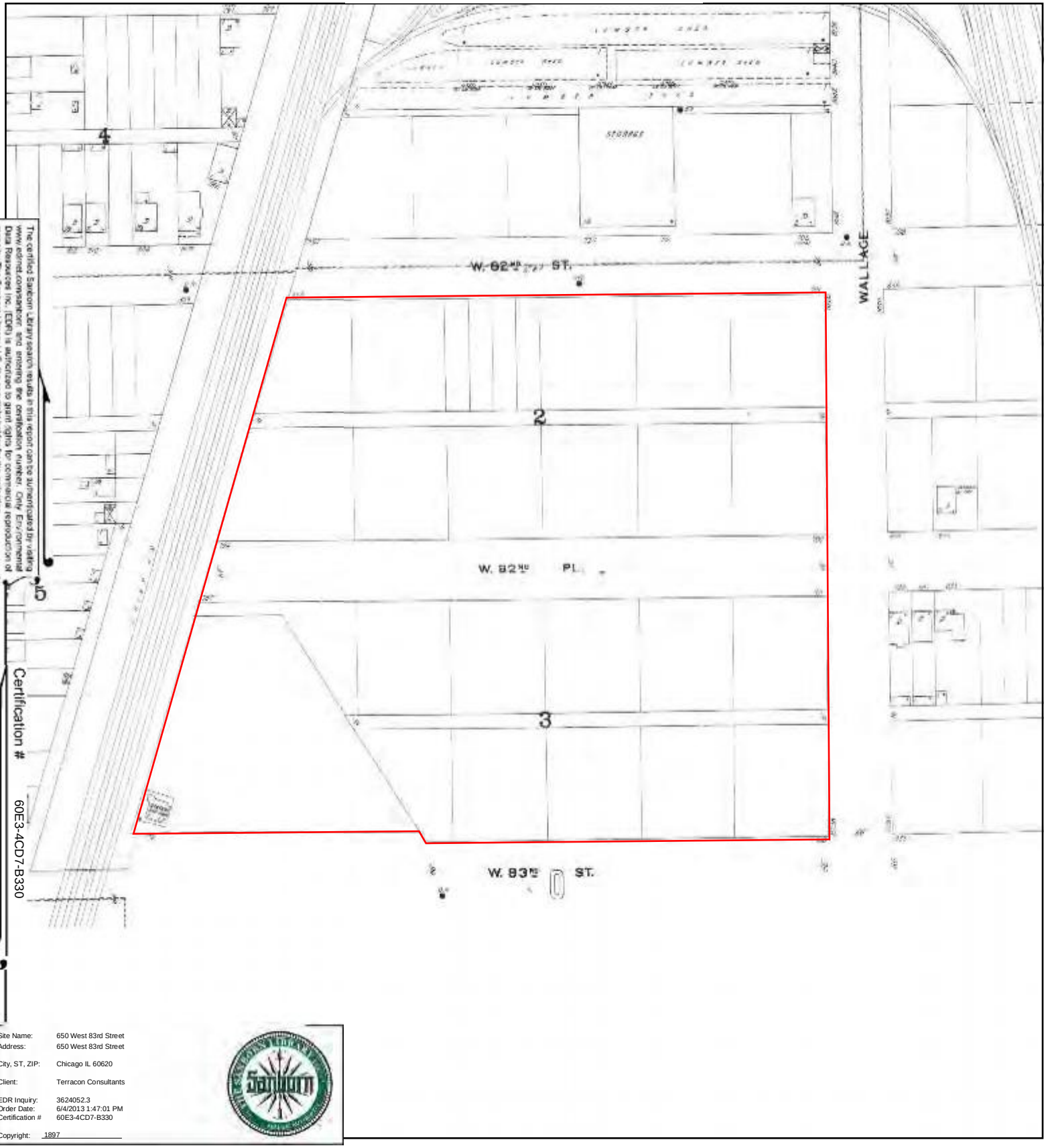


Volume E, Sheet 40
Volume E, Sheet 50

0 Feet 150 300 600

N

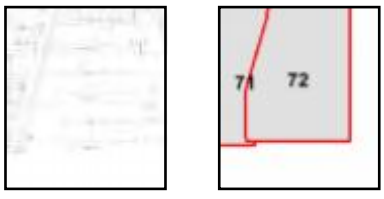
1897 Certified Sanborn Map



Certification # 60E3-4CD7-B330

Site Name: 650 West 83rd Street
Address: 650 West 83rd Street
City, ST, ZIP: Chicago IL 60620
Client: Terracon Consultants
EDR Inquiry: 3624052.3
Order Date: 6/4/2013 1:47:01 PM
Certification # 60E3-4CD7-B330
Copyright: 1897

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.



Volume D, Sheet 71
Volume D, Sheet 72

0 Feet 150 300 600

N

APPENDIX D

Regulatory Database Information

Client/User Required Questionnaire

Terracon

Person Completing Questionnaire	Name: Jason Feldman Company: Green Era Educational NFP	Phone: 312-544-9218 Email: jason@greenerapartners.com
Site Name	650 West 83rd Street Phase I ESA	
Site Address	650 West 83rd Street, Chicago, Illinois 60620	
Point of Contact for Access	Name: Jason Feldman CompanyGreen Era Educational NFP	Phone: 312-544-9218 Email: jason@greenerapartners.com
Access Restrictions or Special Site Requirements?	___No __X__Yes (If yes, please explain) fenced property and access gate is locked	
Confidentiality Requirements?	__X__No ___Yes (If yes, please explain)	
Current Site Owner	Name: Company: Green Era Educational NFP	Phone: 312-544-9218 Email: jason@greenerapartners.com
Current Site Operator	Name: Company: same	Phone: Email:
Reasons for ESA (e.g., financing, acquisition, lease, etc.)	financing	
Anticipated Future Site Use	anaerobic digester facility	
Relevant Documents?	Please provide Terracon copies of prior Phase I or II ESAs, Asbestos Surveys, Environmental Permits or Audit documents, Underground Storage Tank documents, Geotechnical Investigations, Site Surveys, Diagrams or Maps, or other relevant reports or documents.	

ASTM User Questionnaire

In order to qualify for one of the Landowner Liability Protections (LLPs) offered by the Small Business Relief and Brownfields Revitalization Act of 2001 (the "Brownfields Amendments"), the user must respond to the following questions. Failure to provide this information to the environmental professional may result in significant data gaps, which may limit our ability to identify recognized environmental conditions resulting in a determination that "all appropriate inquiry" is not complete. This form represents a type of interview and as such, the user has an obligation to answer all questions in good faith, to the extent of their actual knowledge.

1) Did a search of recorded land title records (or judicial records where appropriate) identify any environmental liens filed or recorded against the property under federal, tribal, state, or local law (40 CFR 312.25)?
__x__No ___Yes (If yes, explain below and send Terracon a copy of the title records or judicial records reviewed.)

2) Did a search of recorded land title records (or judicial records where appropriate) identify any activity and use limitations (AULs), such as engineering controls, land use restrictions, or institutional controls that are in place at the property and/or have been filed or recorded against the property under federal, tribal, state, or local law (40 CFR 312.26)?
__x__No ___Yes (If yes, explain below and send Terracon a copy of the title records or judicial records reviewed.)

3) Do you have any specialized knowledge or experience related to the site or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the site or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business (40 CFR 312-28)?
__x__No ___Yes (If yes, explain below)

4) Do you have actual knowledge of a lower purchase price because contamination is known or believed to be present at the site (40 CFR 312.29)?
__x__No ___Yes ___Not applicable (If yes or Not applicable, explain below)

5) Are you aware of commonly known or reasonably ascertainable information about the site that would help the environmental professional to identify conditions indicative of releases or threatened releases (40 CFR 312.30)?
__x__No ___Yes (If yes, explain below)

6) Based on your knowledge and experience related to the site, are there any obvious indicators that point to the presence or likely presence of contamination at the site (40 CFR 312.31)?
__x__No ___Yes (If yes, explain below)

Comments or explanations:

Please return this form with the signed authorization to proceed.

650 West 83rd Street Phase I ESA
650 West 83rd Street
Chicago, IL 60620

Inquiry Number: 5986820.2s
February 26, 2020

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

MAPPED SITES SUMMARY

Target Property Address:
650 WEST 83RD STREET
CHICAGO, IL 60620

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	CITY OF CHICAGO-DEPT	650 WEST 83RD	SRP, CHICAGO ENV		TP
A2		650 W. 83RD ST.	SPILLS		TP
B3	PUTMAN BROS	8256 58 EMERALD AV	EDR Hist Auto	Lower	285, 0.054, WSW
4	SMALL BUSINESS ADMIN	8201 SOUTH WALLACE	LUST	Lower	308, 0.058, NE
5	OXFORD METAL INC	8316 THRU 40 S BIRKH	RCRA-VSQG, FINDS, ECHO	Lower	404, 0.077, South
B6	PAT S CAR CARE CENTE	8301 S HALSTED ST	EDR Hist Auto	Lower	422, 0.080, WSW
B7	83RD STREET GAS	8255 S HALSTED ST	EDR Hist Auto	Higher	428, 0.081, WSW
B8	FALCON #3	8255 SOUTH HALSTED	UST	Higher	428, 0.081, WSW
B9	ROBERT L WILLIAMS ME	8311 S HALSTED	EDR Hist Auto	Lower	455, 0.086, WSW
B10	CHICAGO DROP CLOTH S	8241 S HALSTED PKW	EDR Hist Cleaner	Higher	458, 0.087, West
C11	BANK OF COMMERCE & I	8259 S HALSTED ST	LUST, RCRA NonGen / NLR, FINDS, ECHO	Lower	547, 0.104, West
C12	BOB AUTO REPAIR	8259 S HALSTED ST	UST	Lower	547, 0.104, West
C13	BOB AUTO RPR	8257 S HALSTED	EDR Hist Auto	Lower	550, 0.104, West
D14	HECKLER GEO H	8318 S HALSTED	EDR Hist Auto	Higher	632, 0.120, WSW
E15	ARNOLD GEO	8159 N HALSTED	EDR Hist Auto	Lower	640, 0.121, WNW
D16	MARQUETTE AUTO RADIA	8300 S HALSTED ST	EDR Hist Auto	Lower	643, 0.122, WSW
E17	AUBURN AUTO REPAIR C	8147 S HALSTED	EDR Hist Auto	Lower	658, 0.125, WNW
F18	ADVANCED ADHESIVES	601 W 81ST ST	RCRA-SQG	Lower	661, 0.125, NNE
F19	HANSEN-STERLING DRUM	8101 S WALLACE ST	RCRA NonGen / NLR, FINDS, ECHO	Lower	675, 0.128, NNE
F20	MEYER INDUSTRIAL CON	610 W 81ST ST	RCRA-SQG	Lower	747, 0.141, NNE
F21	81ST/WALLACE AVE		IL NIPC	Lower	747, 0.141, North
E22	AMM MARATHON, INC.	8158 S. HALSTED ST	UST	Lower	759, 0.144, WNW
E23	TOUMAH, YASSER	8158 SOUTH HALSTED S	LUST	Lower	759, 0.144, WNW
G24	MORGAN	8407 S KERFOOT AVE	RCRA NonGen / NLR, FINDS, ECHO	Lower	886, 0.168, South
25	NATIONAL CASEIN CO I	601 W 80TH ST	RCRA NonGen / NLR, US AIRS	Lower	918, 0.174, North
H26	SIMEON VOCATIONAL HI	8235 S VINCENNES AVE	RCRA-VSQG, FINDS, ECHO	Lower	938, 0.178, East
H27	SIMEON SCHOOL	8233 S VINCENNES	UST	Lower	941, 0.178, East
G28	SUNRISE TRANSPORTATI	8500 SOUTH VINCENNES	INST CONTROL, SRP, CHICAGO ENV	Lower	957, 0.181, SSE
H29	SIMEON CAREER ACADEM	8221 SOUTH VINCENNES	ENG CONTROLS, INST CONTROL, SRP	Lower	959, 0.182, East
I30	NAOMI & SYLVESTER SM	8045 SOUTH HALSTED	LUST	Lower	1051, 0.199, NW
31	CARDWELL WESTINGHOUS	433 W 83RD ST	RCRA-SQG	Lower	1070, 0.203, East
I32	WITHERSPOON HENRY	8054-58 S HALSTED	UST	Lower	1202, 0.228, NW
I33	CONSTRUCTION SITE (F	8031-8047 S. HALSTED	UST	Lower	1208, 0.229, NW
34	95 HALSTEAD, INC.	8420 SOUTH HALSTED	LUST	Higher	1235, 0.234, SW
J35	81ST/VINCENNES AVE		IL NIPC	Lower	1267, 0.240, NE
K36	SUNRISE BUS AND CHAR	8512 SOUTH	AST	Higher	1281, 0.243, South
K37	SUNRISE BUS AND CHAR	8512 SOUTH	AST	Higher	1281, 0.243, South
38	NEW PISGAH BAPTIST C	8019-8047 SOUTH HALS	SRP	Lower	1307, 0.248, NNW
J39	SIMEON VOCATIONAL HI	8101 SOUTH VINCENNES	SRP	Lower	1332, 0.252, NE

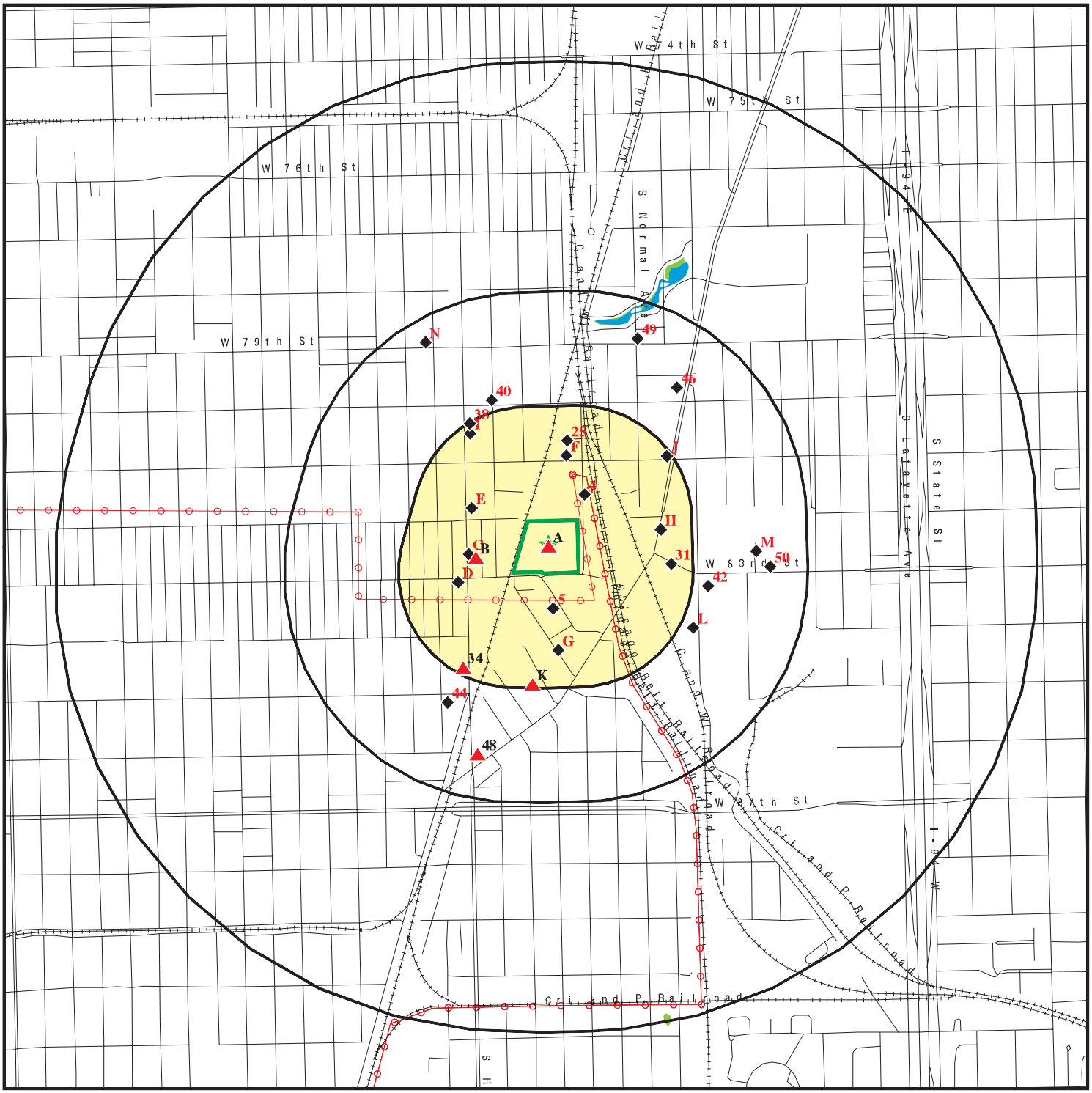
MAPPED SITES SUMMARY

Target Property Address:
650 WEST 83RD STREET
CHICAGO, IL 60620

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
40	80TH/EMERALD AVE		IL NIPC	Lower	1453, 0.275, NNW
L41	CARDELL WESTINGHOUSE	8400 SOUTH STUART	LUST	Lower	1466, 0.278, ESE
42	W2005 CMK REALTY L.L	8301 SOUTH STEWART	LUST, ENG CONTROLS, INST CONTROL, SRP	Lower	1501, 0.284, ESE
L43	DEPAUL BUILDERS	8500 SOUTH STEWART A	SRP, BOL	Lower	1556, 0.295, ESE
44	CHICAGO, CITY OF	8501 SOUTH GREEN STR	LUST	Lower	1673, 0.317, SSW
M45	KEMMERER BOTTLING	300 WEST 83RD STREET	LUST	Lower	1885, 0.357, East
46	HILL, JOHN	7936 SOUTH VINCENNES	LUST	Lower	1909, 0.362, NE
M47	PRINCETON & SMITH, I	8233 SOUTH PRINCETON	LUST, ENG CONTROLS, INST CONTROL, SRP, SPILLS	Lower	2051, 0.388, East
48	BP SERVICE STATION #	8654 VINCENNES AVENU	LUST, CHICAGO ENV	Higher	2129, 0.403, SSW
49	AUBURN LAKES VENTURE	7851 NORMAL ST	LUST, BOL	Lower	2203, 0.417, NNE
50	250 WEST 83RD LLC	250 WEST 83RD STREET	LUST, ENG CONTROLS, INST CONTROL, SRP	Lower	2208, 0.418, East
N51	CHICAGO, CITY OF	825 WEST 79TH ST.	LUST	Lower	2215, 0.420, NNW
N52	MID AMERICAL INVESTM	838-840 WEST 79TH ST	LUST	Lower	2370, 0.449, NNW

OVERVIEW MAP - 5986820.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

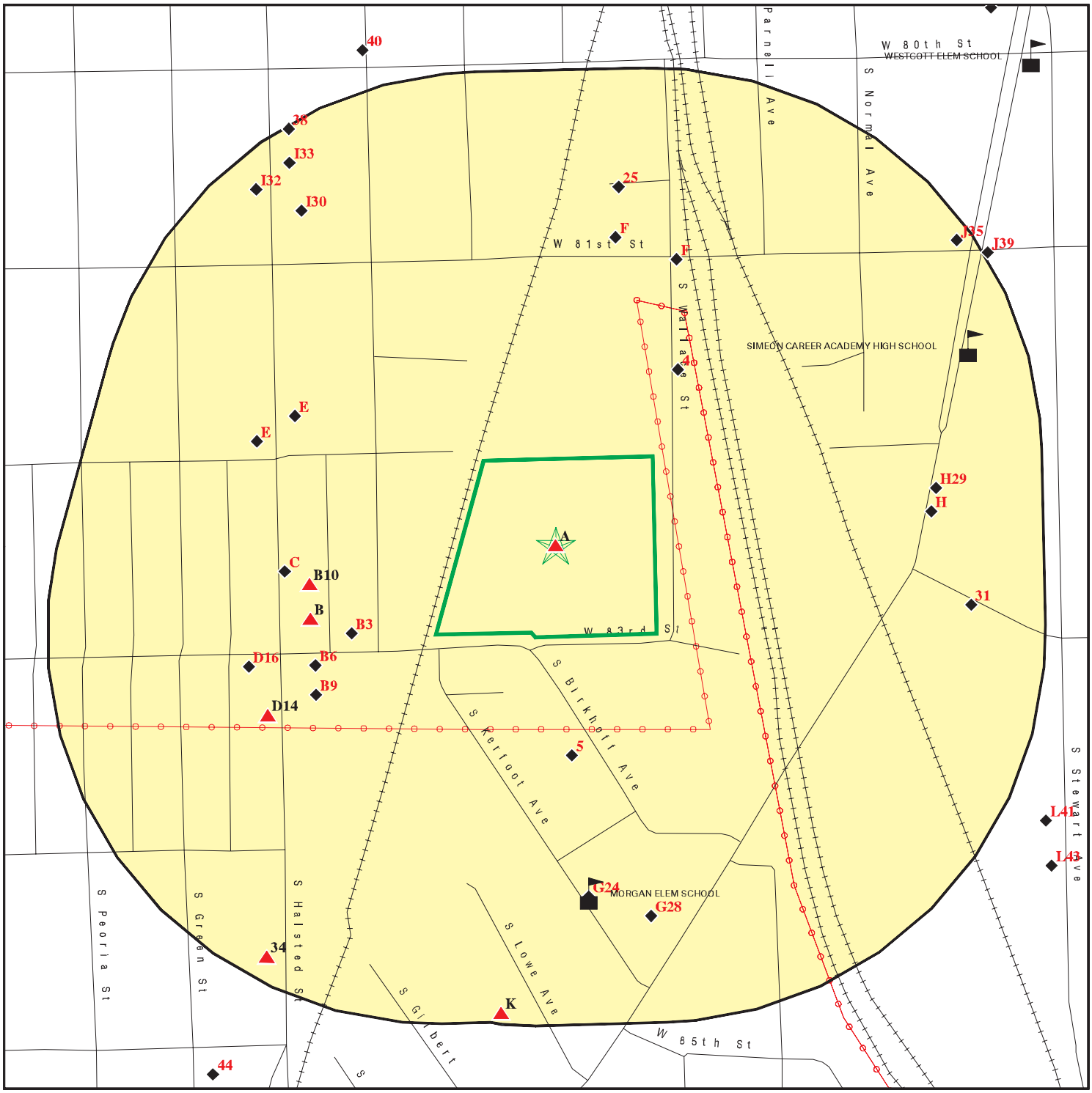
National Wetland Inventory

State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	650 West 83rd Street Phase I ESA	CLIENT:	Terracon
ADDRESS:	650 West 83rd Street Chicago IL 60620	CONTACT:	Chris Heynen
LAT/LONG:	41.744363 / 87.640421	INQUIRY #:	5986820.2s
		DATE:	February 26, 2020 2:37 pm

DETAIL MAP - 5986820.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	650 West 83rd Street Phase I ESA	CLIENT:	Terracon
ADDRESS:	650 West 83rd Street Chicago IL 60620	CONTACT:	Chris Heynen
LAT/LONG:	41.744363 / 87.640421	INQUIRY #:	5986820.2s
		DATE:	February 26, 2020 2:38 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	3	NR	NR	NR	3
RCRA-VSQG	0.250		1	1	NR	NR	NR	2
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SSU	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
CCDD	0.500		0	0	0	NR	NR	0
LF SPECIAL WASTE	0.500		0	0	0	NR	NR	0
IL NIPC	0.500		0	2	1	NR	NR	3
State and tribal leaking storage tank lists								
LUST	0.500		2	3	11	NR	NR	16

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
LUST TRUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		2	4	NR	NR	NR	6
AST	0.250		0	2	NR	NR	NR	2
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS	0.500		0	1	3	NR	NR	4
INST CONTROL	0.500		0	2	3	NR	NR	5
State and tribal voluntary cleanup sites								
SRP	0.500	1	0	3	5	NR	NR	9
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
TANKS	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP	1	NR	NR	NR	NR	NR	1
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		1	3	NR	NR	NR	4

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
AIRS	TP		NR	NR	NR	NR	NR	0
ASBESTOS	TP		NR	NR	NR	NR	NR	0
BOL	TP		NR	NR	NR	NR	NR	0
CHICAGO ENV	TP	1	NR	NR	NR	NR	NR	1
COAL ASH	0.500		0	0	0	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
HWAR	TP		NR	NR	NR	NR	NR	0
IMPDMENT	0.500		0	0	0	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
PIMW	0.250		0	0	NR	NR	NR	0
TIER 2	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
MINES MRDS	TP		NR	NR	NR	NR	NR	0

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.000		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EDR Hist Auto	0.125		9	NR	NR	NR	NR	9
EDR Hist Cleaner	0.125		1	NR	NR	NR	NR	1
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA HWS	TP		NR	NR	NR	NR	NR	0
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		3	16	24	23	0	0	66

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 **CITY OF CHICAGO-DEPT OF FLEET MGMT/OLD CITY POUND** **SRP** **S113274315**
Target **650 WEST 83RD** **CHICAGO ENV** **N/A**
Property **CHICAGO, IL 60620**

Site 1 of 2 in cluster A

Actual: **602 ft.**

SRP:

IL EPA Id:	316715228
Longitude:	-87.640491
Latitude:	41.744293
Contact Name:	Kimberly Worthington
Contact Address:	30 North LaSalle Street
Contact City,St,Zip:	Chicago, IL 60602-2575
Date Enrolled:	02/09/2015
Point Of Contact:	Richard O'Brien, P.E.
Consultant Company:	Terracon
Consultant Address:	650 West Lake Street
Consultant City,St,Zip:	Chicago, IL 60661
Proj Mgr Assigned:	Rhett Rossi
Active:	Yes
Remediation Applicant Co:	City of Chicago, Dept of Fleet & Facililty Management

CHICAGO ENV:

Address:	650 W 83RD ST
City,State,Zip:	CHICAGO, IL
Map Location:	POINT (-87.64076498141297 41.74354189089124)
Inspections:	Y
Latitude:	41.743541891
Longitude:	-87.640764981

A2 **SPILLS** **S112359906**
Target **650 W. 83RD ST.** **N/A**
Property **CHICAGO, IL**

Site 2 of 2 in cluster A

Actual: **602 ft.**

SPILLS:

City,State,Zip:	CHICAGO, IL
Incident ID:	NL860889
Date Received:	08/14/1986
Facility Address:	650 W. 83RD ST.
Facility City:	CHICAGO
PRP Name:	UNKNOWN
Source Table:	dbo_OCIN_INDCIDENTHIS

B3 **PUTMAN BROS** **EDR Hist Auto** **1009115034**
WSW **8256 58 EMERALD AV** **N/A**
< 1/8 **CHICAGO, IL**
0.054 mi.
285 ft. **Site 1 of 6 in cluster B**

Relative: **Lower**

EDR Hist Auto

Actual: **600 ft.**

Year:	Name:	Type:
1923	PUTMAN BROS	AUTOMOBILE REPAIRING

4
NE
< 1/8
0.058 mi.
308 ft.

SMALL BUSINESS ADMIN.
8201 SOUTH WALLACE
CHICAGO, IL 60620

Database(s): **LUST**
EDR ID Number: **S104189895**
EPA ID Number: **N/A**

Relative:
Lower

Actual:
600 ft.

LUST:

Name:	SMALL BUSINESS ADMIN.
Address:	8201 SOUTH WALLACE
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	913213
IL EPA Id:	316715047
Product:	Fuel Oil, Non-Petroleum Product
IEMA Date:	1991-11-07
Project Manager:	Myers
PRP Name:	Small Business Admin.
PRP Contact:	Don Pellico
PRP Address:	500 West Madison St., Suite 1250
PRP City,St,Zip:	Chicago, IL 60661
PRP Phone:	3123534528
Section 57.5(g) Letter:	731
NFA/NFR Letter:	**2010-01-26**

5
South
< 1/8
0.077 mi.
404 ft.

OXFORD METAL INC
8316 THRU 40 S BIRKHOFF
CHICAGO, IL 60620

Database(s): **RCRA-VSQG, FINDS, ECHO**
EDR ID Number: **1004692481**
EPA ID Number: **IL0000366401**

Relative:
Lower

Actual:
600 ft.

RCRA-VSQG:

Date form received by agency:	1994-06-14 00:00:00.0
Facility name:	OXFORD METAL INC
Facility address:	8316 THRU 40 S BIRKHOFF CHICAGO, IL 60620
EPA ID:	IL0000366401
Contact:	MICHAEL RUSHAKOFF
Contact address:	8316 THRU 40 S BIRKHOFF CHICAGO, IL 60620
Contact country:	US
Contact telephone:	312-483-9300
EPA Region:	05
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	GOTTLEIB JEFF

OXFORD METAL INC (Continued) **1004692481**

Owner/operator address: 1650 N ARLINGTON HEIGHTS RD
ARLINGTON HEIGHTS, IL 60004
Owner/operator telephone: 708-392-8150
Legal status: Private
Owner/Operator Type: Owner

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Hazardous Waste Summary:

. Waste code: D000
. Waste name: Not Defined

. Waste code: D008
. Waste name: LEAD

. Waste code: K046
. Waste name: WASTEWATER TREATMENT SLUDGES FROM THE MANUFACTURING, FORMULATION, AND LOADING OF LEAD-BASED INITIATING COMPOUNDS.

Violation Status: No violations found

FINDS:

Registry ID: 110005801819

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1004692481
Registry ID: 110005801819
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110005801819

B6 **PAT S CAR CARE CENTER** **EDR Hist Auto** **1009074937**
WSW **8301 S HALSTED ST** **N/A**
< 1/8 **CHICAGO, IL**
0.080 mi.
422 ft. **Site 2 of 6 in cluster B**

Relative: EDR Hist Auto
Lower

Actual: Year: Name: Type:
600 ft. 2003 PAT S CAR CARE CENTER AUTOMOBILE REPAIR AND SERVICE

B7 **83RD STREET GAS** **EDR Hist Auto** **1020952630**
WSW **8255 S HALSTED ST** **N/A**
< 1/8 **CHICAGO, IL 60620**
0.081 mi.
428 ft. **Site 3 of 6 in cluster B**

Relative: EDR Hist Auto
Higher

Actual: Year: Name: Type:
602 ft. 2005 83RD STREET GAS Gasoline Service Stations
2006 83RD STREET GAS Gasoline Service Stations
2007 83RD STREET GAS Gasoline Service Stations
2008 LUDHIANA HALSTED INC Gasoline Service Stations
2008 83RD STREET GAS Gasoline Service Stations
2009 83RD STREET GAS Gasoline Service Stations
2010 83RD STREET GAS Gasoline Service Stations
2011 CITGO 83 INC Gasoline Service Stations, NEC
2011 83RD STREET GAS Gasoline Service Stations
2012 83RD STREET GAS Gasoline Service Stations
2013 83RD STREET GAS Gasoline Service Stations
2014 83RD STREET GAS Gasoline Service Stations

B8 **FALCON #3** **UST** **U003929730**
WSW **8255 SOUTH HALSTED** **N/A**
< 1/8 **CHICAGO, IL 60620**
0.081 mi.
428 ft. **Site 4 of 6 in cluster B**

Relative: UST:
Higher

Actual:
602 ft.

Name:	FALCON #3
Address:	8255 SOUTH HALSTED
City:	CHICAGO
Zip:	60620
Facility ID:	2041853
Facility Status:	ACTIVE
Facility Type:	**SELF-SERVICE STATION**
Owner Id:	U0036983
Owner Name:	Mohammed Abdallah
Owner Address:	11034 Woodstock Dr.
Owner City,St,Zip:	Orland Park, IL 60462
Tank Number:	1
Tank Status:	**Currently in use**
Tank Capacity:	15000
Tank Substance:	Gasoline - Regular
OSFM First Notify Date:	4/27/2004
Install Date:	9/4/2003

FALCON #3 (Continued) **U003929730**

Green Tag Decal:	**S001888**
Green Tag Issue Date:	**5/11/2017**
Green Tag Expire Date:	**12/31/2019**
Fee Due:	$0.00
Motor Fuel Permit Inspection Date:	5/11/2017
Motor Fuel Permit Expiration Date:	12/31/2019
MOTOR FUEL TYPE:	SelfSrv
Pending Nov:	Y
Equipment Type:	Corrosion Prot - Piping
Equipment:	Flexible Non-Corrosive
Last Passing Date:	N/A
Test Expire Date:	N/A

Tank Number:	2
Tank Status:	**Currently in use**
Tank Capacity:	8000
Tank Substance:	Gasoline - Premium
OSFM First Notify Date:	4/27/2004
Install Date:	9/4/2003
Green Tag Decal:	**S001888**
Green Tag Issue Date:	**5/11/2017**
Green Tag Expire Date:	**12/31/2019**
Fee Due:	$0.00
Motor Fuel Permit Inspection Date:	5/11/2017
Motor Fuel Permit Expiration Date:	12/31/2019
MOTOR FUEL TYPE:	SelfSrv
Pending Nov:	Y
Equipment Type:	Corrosion Prot - Piping
Equipment:	Flexible Non-Corrosive
Last Passing Date:	N/A
Test Expire Date:	N/A

Tank Number:	3
Tank Status:	**Currently in use**
Tank Capacity:	7000
Tank Substance:	Diesel Fuel
OSFM First Notify Date:	4/27/2004
Install Date:	9/4/2003
Green Tag Decal:	**S001888**
Green Tag Issue Date:	**5/11/2017**
Green Tag Expire Date:	**12/31/2019**
Fee Due:	$0.00
Motor Fuel Permit Inspection Date:	5/11/2017
Motor Fuel Permit Expiration Date:	12/31/2019
MOTOR FUEL TYPE:	SelfSrv
Pending Nov:	Y
Equipment Type:	Corrosion Prot - Piping
Equipment:	Flexible Non-Corrosive
Last Passing Date:	N/A
Test Expire Date:	N/A

B9 **ROBERT L WILLIAMS MECHANIC** **EDR Hist Auto** **1021028592**
WSW **8311 S HALSTED** **N/A**
< 1/8 **CHICAGO, IL 60620**
0.086 mi.
455 ft. **Site 5 of 6 in cluster B**

Relative: EDR Hist Auto
Lower

Actual: Year: Name: Type:
601 ft. 1989 ROBERT L WILLIAMS MECHANIC Automotive Transmission Repair Shops
1991 WILLIAMS ROBERT L MECHANIC Automotive Transmission Repair Shops
1992 WILLIAMS ROBERT L MECHANIC Automotive Transmission Repair Shops
1993 WILLIAMS ROBERT L MECHANIC Automotive Transmission Repair Shops

---

B10 **CHICAGO DROP CLOTH SERVICE AND SALES** **EDR Hist Cleaner** **1009188106**
West **8241 S HALSTED PKWY** **N/A**
< 1/8 **CHICAGO, IL**
0.087 mi.
458 ft. **Site 6 of 6 in cluster B**

Relative: EDR Hist Cleaner
Higher

Actual: Year: Name: Type:
602 ft. 1981 CHICAGO DROP CLOTH SERVICE AND LAUNDRIES

C11 **BANK OF COMMERCE & IND** **LUST** **1000462985**
West **8259 S HALSTED ST** **RCRA NonGen / NLR** **ILD984812537**
< 1/8 **CHICAGO, IL 60620** **FINDS**
0.104 mi. **ECHO**
547 ft. **Site 1 of 3 in cluster C**

Relative: LUST:
Lower

Actual:
601 ft.

Name:	BANK OF COMMERCE & INDUSTRY
Address:	8259 SOUTH HALSTED
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	910309
IL EPA Id:	316715033
Product:	Gasoline
IEMA Date:	1991-02-06
Project Manager:	D. Hollis
PRP Name:	Bank of Commerce & Industry
PRP Contact:	Donald Houder
PRP Address:	6100 North Northwest Hwy.
PRP City,St,Zip:	Chicago, IL
Section 57.5(g) Letter:	731
20 Report Received:	1992-02-29
45 Report Received:	1992-02-29
NFA/NFR Letter:	**1995-07-10**

RCRA NonGen / NLR:

Date form received by agency:	2019-12-13 00:00:00.0
Facility name:	BANK OF COMMERCE AND IND
Facility address:	8259 S HALSTED ST CHICAGO, IL 60620
EPA ID:	ILD984812537
EPA Region:	05
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

BANK OF COMMERCE & IND (Continued) **1000462985**

Owner/Operator Summary:
- Owner/operator name: BANK OF COMMERCE AND IND
- Legal status: Private
- Owner/Operator Type: Owner

Handler Activities Summary:
- U.S. importer of hazardous waste: No
- Recycler of hazardous waste: No
- Transporter of hazardous waste: No
- Treater, storer or disposer of HW: No
- Underground injection activity: No
- On-site burner exemption: No
- Furnace exemption: No
- Used oil fuel burner: No
- Used oil processor: No
- User oil refiner: No
- Used oil fuel marketer to burner: No
- Used oil Specification marketer: No
- Used oil transfer facility: No
- Used oil transporter: No

Historical Generators:
- Date form received by agency: 1991-01-23 00:00:00.0
- Site name: BANK OF COMMERCE AND IND
- Classification: Small Quantity Generator

Hazardous Waste Summary:

- Waste code: D001
- Waste name: IGNITABLE WASTE

Violation Status: No violations found

FINDS:

Registry ID: 110005884052

Environmental Interest/Information System

ACES (Illinois - Agency Compliance And Enforcement System) is the Illinois EPA Project to facilitate the permitting operations
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
- Envid: 1000462985
- Registry ID: 110005884052
- DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110005884052

C12 **BOB AUTO REPAIR** **UST** **U000864743**
West **8259 S HALSTED ST** **N/A**
< 1/8 **CHICAGO, IL 60631**
0.104 mi.
547 ft. **Site 2 of 3 in cluster C**

Relative: UST:
Lower

Actual:
601 ft.

Name:	BOB AUTO REPAIR
Address:	8259 S HALSTED ST
City:	CHICAGO
Zip:	60631
Facility ID:	2026421
Facility Status:	CLOSED
Facility Type:	**NONE**
Owner Id:	U0001126
Owner Name:	Bank Of Commerce & Industry
Owner Address:	6100 N Nw Hwy
Owner City,St,Zip:	Chicago, IL 60631
Tank Number:	1
Tank Status:	**Removed**
Tank Capacity:	4000
Tank Substance:	Gasoline
Last Used Date:	1/1/1980
OSFM First Notify Date:	10/29/1990
Fee Due:	$0.00
Pending Nov:	N
IEMA:	91-0309
Removed Date:	2/1/1991
Tank Number:	2
Tank Status:	**Removed**
Tank Capacity:	4000
Tank Substance:	Gasoline
Last Used Date:	1/1/1980
OSFM First Notify Date:	10/29/1990
Fee Due:	$0.00
Pending Nov:	N
IEMA:	91-0309
Removed Date:	2/1/1991
Tank Number:	3
Tank Status:	**Removed**
Tank Capacity:	4000
Tank Substance:	Gasoline
Last Used Date:	1/1/1980
OSFM First Notify Date:	10/29/1990
Fee Due:	$0.00
Pending Nov:	N
IEMA:	91-0309
Removed Date:	2/1/1991
Tank Number:	4
Tank Status:	**Removed**
Tank Capacity:	300
Tank Substance:	Used Oil

BOB AUTO REPAIR (Continued) **U000864743**

Last Used Date:	1/1/1980
OSFM First Notify Date:	10/29/1990
Fee Due:	$0.00
Pending Nov:	N
Removed Date:	2/1/1991

Tank Number:	5
Tank Status:	**Removed**
Tank Capacity:	4000
Tank Substance:	Gasoline
Last Used Date:	1/1/1980
OSFM First Notify Date:	2/28/1991
Fee Due:	$0.00
Pending Nov:	N
IEMA:	91-0309
Removed Date:	2/1/1991

Tank Number:	6
Tank Status:	**Removed**
Tank Capacity:	4000
Tank Substance:	Gasoline
Last Used Date:	1/1/1980
OSFM First Notify Date:	2/28/1991
Fee Due:	$0.00
Pending Nov:	N
Removed Date:	2/1/1991

Tank Number:	7
Tank Status:	**Removed**
Tank Capacity:	550
Tank Substance:	Heating Oil
Last Used Date:	1/1/1992
OSFM First Notify Date:	6/3/1992
Fee Due:	$0.00
Pending Nov:	N
IEMA:	91-0309
Removed Date:	2/6/1991

C13 **BOB AUTO RPR** **EDR Hist Auto** **1020131067**
West **8257 S HALSTED** **N/A**
< 1/8 **CHICAGO, IL 60620**
0.104 mi.
550 ft. **Site 3 of 3 in cluster C**

Relative: EDR Hist Auto
Lower

Actual: **601 ft.**

Year:	Name:	Type:
1971	SHAFFERS ENCO SERVICE STATION	Gasoline Service Stations
1972	SHAFFERS ENCO SERVICE STATION	Gasoline Service Stations
1973	SHAFFERS ENCO SERVICE STATION	Gasoline Service Stations
1974	SHAFFERS ENCO SERVICE STATION	Gasoline Service Stations
1986	BOB AUTO RPR	General Automotive Repair Shops
1987	BOB AUTO RPR	General Automotive Repair Shops
1988	BOB AUTO RPR	General Automotive Repair Shops
1989	BOB AUTO RPR	General Automotive Repair Shops

BOB AUTO RPR (Continued) **1020131067**

1990	BOB AUTO RPR	General Automotive Repair Shops
1991	BOB AUTO RPR	General Automotive Repair Shops
1992	BOB AUTO REPAIR	General Automotive Repair Shops
1993	BOB AUTO REPAIR	General Automotive Repair Shops
1994	BOB AUTO REPAIR	General Automotive Repair Shops
1995	BOBS AUTO REBUILDING	General Automotive Repair Shops
1996	BOBS AUTO REBUILDING	General Automotive Repair Shops
1997	BOBS AUTO REBUILDING	General Automotive Repair Shops
1998	BOBS AUTO REPAIR	General Automotive Repair Shops
1999	BOBS AUTO REPAIR	General Automotive Repair Shops
2000	BOBS AUTO REPAIR	General Automotive Repair Shops
2001	BOBS AUTO REPAIR	General Automotive Repair Shops
2002	BOBS AUTO REPAIR	General Automotive Repair Shops

D14 **HECKLER GEO H** **EDR Hist Auto** **1009100980**
WSW **8318 S HALSTED** **N/A**
< 1/8 **CHICAGO, IL**
0.120 mi.
632 ft. **Site 1 of 2 in cluster D**

Relative: EDR Hist Auto
Higher

Actual: Year: Name: Type:
604 ft. 1928 HECKLER GEO H AUTOMOBILE REPAIRING

E15 **ARNOLD GEO** **EDR Hist Auto** **1009105256**
WNW **8159 N HALSTED** **N/A**
< 1/8 **CHICAGO, IL**
0.121 mi.
640 ft. **Site 1 of 4 in cluster E**

Relative: EDR Hist Auto
Lower

Actual: Year: Name: Type:
600 ft.

1928	ARNOLD GEO	AUTOMOBILE REPAIRING
1970	PENNYS SERVICE STATION	Gasoline Service Stations
1989	C & M AUTO REPAIR	General Automotive Repair Shops
1990	C & M AUTO REPAIR	General Automotive Repair Shops
1991	C & M AUTO REPAIR	General Automotive Repair Shops
1992	C & M AUTO REPAIR	General Automotive Repair Shops
1993	C & M AUTO REPAIR	General Automotive Repair Shops
1994	C & M AUTO REPAIR	General Automotive Repair Shops
1995	C & M AUTO REPAIR	General Automotive Repair Shops

D16 **MARQUETTE AUTO RADIATOR SERV** **EDR Hist Auto** **1009071646**
WSW **8300 S HALSTED ST** **N/A**
< 1/8 **CHICAGO, IL**
0.122 mi.
643 ft. **Site 2 of 2 in cluster D**

Relative: EDR Hist Auto
Lower

Actual: Year: Name: Type:
600 ft.

1969	MARQUETTE AUTO RADIATOR SERVCE	Automotive Repair Shops, NEC
1970	MARQUETTE AUTO RADIATOR SERVCE	Automotive Repair Shops, NEC

MARQUETTE AUTO RADIATOR SERV (Continued) **1009071646**

1971	MARQUETTE AUTO RADIATOR SV	Automotive Repair Shops, NEC
1972	MARQUETTE AUTO RADIATOR SV	Automotive Repair Shops, NEC
1973	MARQUETTE AUTO RADIATOR SV	Automotive Repair Shops, NEC
1974	MARQUETTE AUTO RADIATOR SV	Automotive Repair Shops, NEC
1975	MARQUETTE AUTO RADIATOR SV	Automotive Repair Shops, NEC
1976	MARQUETTE AUTO RADIATOR SV	Automotive Repair Shops, NEC
1977	MARQUETTE AUTO RADIATOR SV	Automotive Repair Shops, NEC
1978	MARQUETTE AUTO RADIATOR SV	Automotive Repair Shops, NEC
1979	MARQUETTE AUTO RADIATOR SV	Automotive Repair Shops, NEC
1980	MARQUETTE AUTO RADIATOR SV	Automotive Repair Shops, NEC
1982	MARQUETTE AUTO RADIATOR SV	Automotive Repair Shops, NEC
1983	MARQUETTE AUTO RAD SVC	Automotive Repair Shops, NEC
1985	MARQUETTE AUTO RAD SVC	Automotive Repair Shops, NEC
1986	MARQUETTE AUTO RAD SVC	Automotive Repair Shops, NEC
1987	MARQUETTE AUTO RAD SVC	Automotive Repair Shops, NEC
1988	MARQUETTE AUTO RAD SVC	Automotive Repair Shops, NEC
1989	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
1990	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
1991	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
1992	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
1993	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
1994	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
1995	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
1996	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
1997	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
1998	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
1999	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2000	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2001	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2002	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2003	PHONEDIATOR SERVICE INC	RADIATORS AUTOMOTIVE REBUILDING AND REPAIRING
2003	MARQUETTE AUTO RADIATOR SERV	RADIATORS AUTOMOTIVE REBUILDING AND REPAIRING
2003	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2004	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2005	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2006	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2007	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2008	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2009	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2010	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2011	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2012	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2013	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services
2014	MARQUETTE AUTO RADIATOR SVC	Powertrain Components Repair Services

---

E17 **AUBURN AUTO REPAIR CO** **EDR Hist Auto** **1009105260**
WNW **8147 S HALSTED** **N/A**
< 1/8 **CHICAGO, IL**
0.125 mi.
658 ft. **Site 2 of 4 in cluster E**

Relative: EDR Hist Auto
Lower

Actual: **600 ft.**

Year:	Name:	Type:
1923	FRANCIS FRANK F	AUTOMOBILE REPAIRING
1928	AUBURN AUTO REPAIR CO	AUTOMOBILE REPAIRING

F18
NNE
1/8-1/4
0.125 mi.
661 ft.

ADVANCED ADHESIVES
601 W 81ST ST
CHICAGO, IL 60620

Site 1 of 4 in cluster F

RCRA-SQG **1025502558**
ILR000201913

Relative:
Lower

Actual:
596 ft.

RCRA-SQG:

Date form received by agency:	2019-05-31 00:00:00.0
Facility name:	ADVANCED ADHESIVES
Facility address:	601 W 81ST ST CHICAGO, IL 60620
EPA ID:	ILR000201913
Contact:	DAN SARMAS
Contact address:	601 W 81ST ST CHICAGO, IL 60620
Contact country:	US
Contact telephone:	773-580-5211
Contact email:	DAN@AABBITT.COM
EPA Region:	05
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	ADVANCED ADHESIVES
Owner/operator address:	601 W 81ST ST CHICAGO, IL 60620
Owner/operator country:	US
Legal status:	Private
Owner/Operator Type:	Operator

Owner/operator name:	ADVANCED ADHESIVES
Owner/operator address:	601 W 81ST ST CHICAGO, IL 60620
Owner/operator country:	US
Legal status:	Private
Owner/Operator Type:	Owner

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

ADVANCED ADHESIVES (Continued) **1025502558**

Hazardous Waste Summary:

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: U080
. Waste name: METHANE, DICHLORO- (OR) METHYLENE CHLORIDE

Violation Status: No violations found

F19 **HANSEN-STERLING DRUM CO** **RCRA NonGen / NLR** **1000379871**
NNE **8101 S WALLACE ST** **FINDS** **ILD000814814**
1/8-1/4 **CHICAGO, IL 60620** **ECHO**
0.128 mi.
675 ft. **Site 2 of 4 in cluster F**

Relative:
Lower

Actual:
596 ft.

RCRA NonGen / NLR:
Date form received by agency: 1980-08-18 00:00:00.0
Facility name: HANSEN-STERLING DRUM CO
Facility address: 8101 S WALLACE ST
CHICAGO, IL 60620
EPA ID: ILD000814814
Mailing address: 610 W 81ST ST
CHICAGO, IL 60620
Contact: HARVEY HANSON
Contact address: 610 W 81ST ST
CHICAGO, IL 60620
Contact country: US
Contact telephone: 312-483-5050
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NAME NOT REPORTED
Owner/operator address: ADDRESS NOT REPORTED
CITY NOT REPORTED, AK 99998
Owner/operator telephone: 312-555-1212
Legal status: Private
Owner/Operator Type: Owner

Owner/operator name: NAME NOT REPORTED
Owner/operator address: ADDRESS NOT REPORTED
CITY NOT REPORTED, AK 99998
Owner/operator telephone: 312-555-1212
Legal status: Private
Owner/Operator Type: Operator

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No

HANSEN-STERLING DRUM CO (Continued) **1000379871**

Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Hazardous Waste Summary:

. Waste code: D000
. Waste name: Not Defined

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: U001
. Waste name: ACETALDEHYDE (I) (OR) ETHANAL (I)

. Waste code: U002
. Waste name: 2-PROPANONE (I) (OR) ACETONE (I)

. Waste code: U004
. Waste name: ACETOPHENONE (OR) ETHANONE, 1-PHENYL-

. Waste code: U008
. Waste name: 2-PROPENOIC ACID (I) (OR) ACRYLIC ACID (I)

. Waste code: U012
. Waste name: ANILINE (I,T) (OR) BENZENAMINE (I,T)

. Waste code: U023
. Waste name: BENZENE, (TRICHLOROMETHYL)- (OR) BENZOTRICHLORIDE (C,R,T)

. Waste code: U026
. Waste name: CHLORNAPHAZIN (OR) NAPHTHALENAMINE, N,N'-BIS(2-CHLOROETHYL)-

. Waste code: U031
. Waste name: 1-BUTANOL (I) (OR) N-BUTYL ALCOHOL (I)

. Waste code: U043
. Waste name: ETHENE, CHLORO- (OR) VINYL CHLORIDE

. Waste code: U049
. Waste name: 4-CHLORO-O-TOLUIDINE, HYDROCHLORIDE (OR) BENZENAMINE, 4-CHLORO-2-METHYL-, HYDROCHLORIDE

. Waste code: U054
. Waste name: Not Defined

. Waste code: U056
. Waste name: BENZENE, HEXAHYDRO- (I) (OR) CYCLOHEXANE (I)

. Waste code: U057

HANSEN-STERLING DRUM CO (Continued) **1000379871**

. Waste name: CYCLOHEXANONE (I)

. Waste code: U064
. Waste name: BENZO[RST]PENTAPHENE (OR) DIBENZO[A,I]PYRENE

. Waste code: U075
. Waste name: DICHLORODIFLUOROMETHANE (OR) METHANE, DICHLORODIFLUORO-

. Waste code: U076
. Waste name: ETHANE, 1,1-DICHLORO- (OR) ETHYLIDENE DICHLORIDE

. Waste code: U077
. Waste name: ETHANE, 1,2-DICHLORO- (OR) ETHYLENE DICHLORIDE

. Waste code: U078
. Waste name: 1,1-DICHLOROETHYLENE (OR) ETHENE, 1,1-DICHLORO-

. Waste code: U079
. Waste name: 1,2-DICHLOROETHYLENE (OR) ETHENE, 1,2-DICHLORO-,(E)-

. Waste code: U080
. Waste name: METHANE, DICHLORO- (OR) METHYLENE CHLORIDE

. Waste code: U081
. Waste name: 2,4-DICHLOROPHENOL (OR) PHENOL, 2,4-DICHLORO-

. Waste code: U082
. Waste name: 2,6-DICHLOROPHENOL (OR) PHENOL, 2,6-DICHLORO-

. Waste code: U083
. Waste name: PROPANE, 1,2-DICHLORO- (OR) PROPYLENE DICHLORIDE

. Waste code: U084
. Waste name: 1,3-DICHLOROPROPENE (OR) 1-PROPENE, 1,3-DICHLORO-

. Waste code: U085
. Waste name: 1,2:3,4-DIEPOXYBUTANE (I,T) (OR) 2,2'-BIOXIRANE

. Waste code: U086
. Waste name: HYDRAZINE, 1,2-DIETHYL- (OR) N,N'-DIETHYLHYDRAZINE

. Waste code: U087
. Waste name: O,O-DIETHYL S-METHYL DITHIOPHOSPHATE (OR) PHOSPHORODITHIOIC ACID, O,O-DIETHYL S-METHYL ESTER

. Waste code: U104
. Waste name: Not Defined

. Waste code: U105
. Waste name: 2,4-DINITROTOLUENE (OR) BENZENE, 1-METHYL-2,4-DINITRO-

. Waste code: U106
. Waste name: 2,6-DINITROTOLUENE (OR) BENZENE, 2-METHYL-1,3-DINITRO-

. Waste code: U110
. Waste name: 1-PROPANIMINE, N-PROPYL-(I) (OR) DIPROPYLAMINE (I)

HANSEN-STERLING DRUM CO (Continued) **1000379871**

. Waste code: U112
. Waste name: ACETIC ACID, ETHYL ESTER (I) (OR) ETHYL ACETATE (I)

. Waste code: U122
. Waste name: FORMALDEHYDE

. Waste code: U127
. Waste name: BENZENE, HEXACHLORO- (OR) HEXACHLOROBENZENE

. Waste code: U128
. Waste name: 1,3-BUTADIENE, 1,1,2,3,4,4-HEXACHLORO- (OR) HEXACHLOROBUTADIENE

. Waste code: U131
. Waste name: ETHANE, HEXACHLORO- (OR) HEXACHLOROETHANE

. Waste code: U140
. Waste name: 1-PROPANOL, 2-METHYL- (I,T) (OR) ISOBUTYL ALCOHOL (I,T)

. Waste code: U154
. Waste name: METHANOL (I) (OR) METHYL ALCOHOL (I)

. Waste code: U159
. Waste name: 2-BUTANONE (I,T) (OR) METHYL ETHYL KETONE (MEK) (I,T)

. Waste code: U161
. Waste name: 4-METHYL-2-PENTANONE (I) (OR) METHYL ISOBUTYL KETONE (I) (OR) PENTANOL, 4-METHYL-

. Waste code: U188
. Waste name: PHENOL

. Waste code: U194
. Waste name: 1-PROPANAMINE (I,T) (OR) N-PROPYLAMINE (I,T)

. Waste code: U196
. Waste name: PYRIDINE

. Waste code: U207
. Waste name: 1,2,4,5-TETRACHLOROBENZENE (OR) BENZENE, 1,2,4,5-TETRACHLORO-

. Waste code: U208
. Waste name: 1,1,1,2-TETRACHLOROETHANE (OR) ETHANE, 1,1,1,2-TETRACHLORO-

. Waste code: U209
. Waste name: 1,1,2,2-TETRACHLOROETHANE (OR) ETHANE, 1,1,2,2-TETRACHLORO-

. Waste code: U210
. Waste name: ETHENE, TETRACHLORO- (OR) TETRACHLOROETHYLENE

. Waste code: U220
. Waste name: BENZENE, METHYL- (OR) TOLUENE

. Waste code: U226
. Waste name: ETHANE, 1,1,1-TRICHLORO- (OR) METHYL CHLOROFORM

. Waste code: U228
. Waste name: ETHENE, TRICHLORO- (OR) TRICHLOROETHYLENE

HANSEN-STERLING DRUM CO (Continued) **1000379871**

. Waste code: U238
. Waste name: CARBAMIC ACID, ETHYL ESTER (OR) ETHYL CARBAMATE (URETHANE)

. Waste code: U239
. Waste name: BENZENE, DIMETHYL- (I,T) (OR) XYLENE (I)

Violation Status: No violations found

FINDS:

Registry ID: 110005811149

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1000379871
Registry ID: 110005811149
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110005811149

F20 **MEYER INDUSTRIAL CONTAINER** **RCRA-SQG** **1000379872**
NNE **610 W 81ST ST** **ILD025316126**
1/8-1/4 **CHICAGO, IL 60623**
0.141 mi.
747 ft. **Site 3 of 4 in cluster F**

Relative:
Lower

Actual:
596 ft.

RCRA-SQG:
Date form received by agency: 2018-03-01 00:00:00.0
Facility name: MEYER INDUSTRIAL CONTAINER
Facility address: 610 W 81ST ST
CHICAGO, IL 60623
EPA ID: ILD025316126
Contact: NATHANIAL SMITH
Contact telephone: 773-835-5051
EPA Region: 05
Land type: Private
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: MEYER INDUSTRIAL CONTAINER
Owner/operator address: 610 W 81ST ST
CHICAGO, IL 60620
Owner/operator country: US
Legal status: Private

MEYER INDUSTRIAL CONTAINER (Continued) **1000379872**

Owner/Operator Type: Owner
Owner/Op start date: 2003-09-01 00:00:00.

Owner/operator name: MEYER INDUSTRIAL CONTAINER
Owner/operator address: 610 W 81ST ST
CHICAGO, IL 60620
Owner/operator country: US
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 2003-09-01 00:00:00.

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 2016-03-01 00:00:00.0
Site name: MEYER INDUSTRIAL CONTAINER
Classification: Large Quantity Generator

Date form received by agency: 2013-03-01 00:00:00.0
Site name: MEYER INDUSTRIAL CONTAINER
Classification: Large Quantity Generator

Date form received by agency: 2012-03-01 00:00:00.0
Site name: MEYER INDUSTRIAL CONTAINER
Classification: Large Quantity Generator

Date form received by agency: 2012-03-01 00:00:00.0
Site name: MEYER INDUSTRIAL CONTAINER
Classification: Large Quantity Generator

Date form received by agency: 2010-03-01 00:00:00.0
Site name: MEYER INDUSTRIAL CONTAINER
Classification: Large Quantity Generator

Date form received by agency: 2008-03-01 00:00:00.0
Site name: MEYER INDUSTRIAL CONTAINER LLC
Classification: Large Quantity Generator

Date form received by agency: 2007-03-01 00:00:00.0
Site name: MEYER INDUSTRIAL CONTAINER
Classification: Small Quantity Generator

MEYER INDUSTRIAL CONTAINER (Continued) **1000379872**

Date form received by agency: 2006-03-01 00:00:00.0
Site name: MEYER INDUSTRIAL CONTAINER
Classification: Small Quantity Generator

Date form received by agency: 2004-03-22 00:00:00.0
Site name: MEYER INDUSTRIAL CONTAINER LLC
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 1980-11-15 00:00:00.0
Site name: HANSEN-STERLING DRUM CO
Classification: Not a generator, verified

Date form received by agency: 1980-08-18 00:00:00.0
Site name: HANSEN-STERLING DRUM CO
Classification: Large Quantity Generator

Hazardous Waste Summary:

. Waste code: D000
. Waste name: Not Defined

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: D002
. Waste name: CORROSIVE WASTE

. Waste code: F001
. Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLORETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F002
. Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2, TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F003
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NONHALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS, AND A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005; AND STILL

MEYER INDUSTRIAL CONTAINER (Continued) **1000379872**

BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F004
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: CRESOLS, CRESYLIC ACID, AND NITROBENZENE; AND THE STILL BOTTOMS FROM THE RECOVERY OF THESE SOLVENTS; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NONHALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NONHALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F017
. Waste name: Not Defined

. Waste code: F018
. Waste name: Not Defined

. Waste code: K086
. Waste name: SOLVENT WASHES AND SLUDGES, CAUSTIC WASHES AND SLUDGES, OR WATER WASHES AND SLUDGES FROM CLEANING TUBS AND EQUIPMENT USED IN THE FORMULATION OF INK FROM PIGMENTS, DRIERS, SOAPS, AND STABILIZERS CONTAINING CHROMIUM AND LEAD.

. Waste code: U001
. Waste name: ACETALDEHYDE (I) (OR) ETHANAL (I)

. Waste code: U002
. Waste name: 2-PROPANONE (I) (OR) ACETONE (I)

. Waste code: U004
. Waste name: ACETOPHENONE (OR) ETHANONE, 1-PHENYL-

. Waste code: U008
. Waste name: 2-PROPENOIC ACID (I) (OR) ACRYLIC ACID (I)

. Waste code: U012
. Waste name: ANILINE (I,T) (OR) BENZENAMINE (I,T)

. Waste code: U023
. Waste name: BENZENE, (TRICHLOROMETHYL)- (OR) BENZOTRICHLORIDE (C,R,T)

. Waste code: U026
. Waste name: CHLORNAPHAZIN (OR) NAPHTHALENAMINE, N,N'-BIS(2-CHLOROETHYL)-

. Waste code: U031
. Waste name: 1-BUTANOL (I) (OR) N-BUTYL ALCOHOL (I)

MEYER INDUSTRIAL CONTAINER (Continued) **1000379872**

. Waste code: U043
. Waste name: ETHENE, CHLORO- (OR) VINYL CHLORIDE

. Waste code: U049
. Waste name: 4-CHLORO-O-TOLUIDINE, HYDROCHLORIDE (OR) BENZENAMINE, 4-CHLORO-2-METHYL-, HYDROCHLORIDE

. Waste code: U054
. Waste name: Not Defined

. Waste code: U056
. Waste name: BENZENE, HEXAHYDRO- (I) (OR) CYCLOHEXANE (I)

. Waste code: U057
. Waste name: CYCLOHEXANONE (I)

. Waste code: U064
. Waste name: BENZO[RST]PENTAPHENE (OR) DIBENZO[A,I]PYRENE

. Waste code: U075
. Waste name: DICHLORODIFLUOROMETHANE (OR) METHANE, DICHLORODIFLUORO-

. Waste code: U076
. Waste name: ETHANE, 1,1-DICHLORO- (OR) ETHYLIDENE DICHLORIDE

. Waste code: U077
. Waste name: ETHANE, 1,2-DICHLORO- (OR) ETHYLENE DICHLORIDE

. Waste code: U078
. Waste name: 1,1-DICHLOROETHYLENE (OR) ETHENE, 1,1-DICHLORO-

. Waste code: U079
. Waste name: 1,2-DICHLOROETHYLENE (OR) ETHENE, 1,2-DICHLORO-,(E)-

. Waste code: U080
. Waste name: METHANE, DICHLORO- (OR) METHYLENE CHLORIDE

. Waste code: U081
. Waste name: 2,4-DICHLOROPHENOL (OR) PHENOL, 2,4-DICHLORO-

. Waste code: U082
. Waste name: 2,6-DICHLOROPHENOL (OR) PHENOL, 2,6-DICHLORO-

. Waste code: U083
. Waste name: PROPANE, 1,2-DICHLORO- (OR) PROPYLENE DICHLORIDE

. Waste code: U084
. Waste name: 1,3-DICHLOROPROPENE (OR) 1-PROPENE, 1,3-DICHLORO-

. Waste code: U085
. Waste name: 1,2:3,4-DIEPOXYBUTANE (I,T) (OR) 2,2'-BIOXIRANE

. Waste code: U086
. Waste name: HYDRAZINE, 1,2-DIETHYL- (OR) N,N'-DIETHYLHYDRAZINE

. Waste code: U087
. Waste name: O,O-DIETHYL S-METHYL DITHIOPHOSPHATE (OR) PHOSPHORODITHIOIC ACID,

MEYER INDUSTRIAL CONTAINER (Continued) **1000379872**

O,O-DIETHYL S-METHYL ESTER

. Waste code: U104
. Waste name: Not Defined

. Waste code: U105
. Waste name: 2,4-DINITROTOLUENE (OR) BENZENE, 1-METHYL-2,4-DINITRO-

. Waste code: U106
. Waste name: 2,6-DINITROTOLUENE (OR) BENZENE, 2-METHYL-1,3-DINITRO-

. Waste code: U110
. Waste name: 1-PROPANIMINE, N-PROPYL-(I) (OR) DIPROPYLAMINE (I)

. Waste code: U112
. Waste name: ACETIC ACID, ETHYL ESTER (I) (OR) ETHYL ACETATE (I)

. Waste code: U122
. Waste name: FORMALDEHYDE

. Waste code: U127
. Waste name: BENZENE, HEXACHLORO- (OR) HEXACHLOROBENZENE

. Waste code: U128
. Waste name: 1,3-BUTADIENE, 1,1,2,3,4,4-HEXACHLORO- (OR) HEXACHLOROBUTADIENE

. Waste code: U131
. Waste name: ETHANE, HEXACHLORO- (OR) HEXACHLOROETHANE

. Waste code: U140
. Waste name: 1-PROPANOL, 2-METHYL- (I,T) (OR) ISOBUTYL ALCOHOL (I,T)

. Waste code: U154
. Waste name: METHANOL (I) (OR) METHYL ALCOHOL (I)

. Waste code: U159
. Waste name: 2-BUTANONE (I,T) (OR) METHYL ETHYL KETONE (MEK) (I,T)

. Waste code: U161
. Waste name: 4-METHYL-2-PENTANONE (I) (OR) METHYL ISOBUTYL KETONE (I) (OR) PENTANOL, 4-METHYL-

. Waste code: U188
. Waste name: PHENOL

. Waste code: U194
. Waste name: 1-PROPANAMINE (I,T) (OR) N-PROPYLAMINE (I,T)

. Waste code: U196
. Waste name: PYRIDINE

. Waste code: U207
. Waste name: 1,2,4,5-TETRACHLOROBENZENE (OR) BENZENE, 1,2,4,5-TETRACHLORO-

. Waste code: U208
. Waste name: 1,1,1,2-TETRACHLOROETHANE (OR) ETHANE, 1,1,1,2-TETRACHLORO-

MEYER INDUSTRIAL CONTAINER (Continued) **1000379872**

. Waste code: U209
. Waste name: 1,1,2,2-TETRACHLOROETHANE (OR) ETHANE, 1,1,2,2-TETRACHLORO-

. Waste code: U210
. Waste name: ETHENE, TETRACHLORO- (OR) TETRACHLOROETHYLENE

. Waste code: U220
. Waste name: BENZENE, METHYL- (OR) TOLUENE

. Waste code: U226
. Waste name: ETHANE, 1,1,1-TRICHLORO- (OR) METHYL CHLOROFORM

. Waste code: U228
. Waste name: ETHENE, TRICHLORO- (OR) TRICHLOROETHYLENE

. Waste code: U238
. Waste name: CARBAMIC ACID, ETHYL ESTER (OR) ETHYL CARBAMATE (URETHANE)

. Waste code: U239
. Waste name: BENZENE, DIMETHYL- (I,T) (OR) XYLENE (I)

Biennial Reports:

Last Biennial Reporting Year: 2017

Annual Waste Handled:
Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.
Amount (Lbs): 17603.3

Violation Status: No violations found

F21 **81ST/WALLACE AVE** **IL NIPC** **S100790174**
North **N/A**
1/8-1/4 **CHICAGO, IL**
0.141 mi.
747 ft. **Site 4 of 4 in cluster F**

Relative:
Lower

Actual:
596 ft.

E22
WNW
1/8-1/4
0.144 mi.
759 ft.

AMM MARATHON, INC.
8158 S. HALSTED ST
CHICAGO, IL 60620

Site 3 of 4 in cluster E

UST **U003907984**
N/A

Relative:
Lower

Actual:
600 ft.

UST:

Name:	AMM MARATHON, INC.
Address:	8158 S. HALSTED ST
City:	CHICAGO
Zip:	60620
Facility ID:	2041669
Facility Status:	ACTIVE
Facility Type:	**SELF-SERVICE STATION**
Owner Id:	U0030427
Owner Name:	Yasser Toumah
Owner Address:	10145 S 87th Ave
Owner City,St,Zip:	Palos Hills, IL 60465
Tank Number:	1
Tank Status:	**Removed**
Tank Capacity:	5000
Tank Substance:	Gasoline
Last Used Date:	12/31/1973
Green Tag Decal:	**U003224**
Green Tag Issue Date:	**7/24/2019**
Green Tag Expire Date:	**12/31/2021**
Motor Fuel Permit Inspection Date:	7/24/2019
Motor Fuel Permit Expiration Date:	12/31/2021
MOTOR FUEL TYPE:	SelfSrv
Pending Nov:	N
IEMA:	03-1151
Removed Date:	7/23/2003
Tank Number:	2
Tank Status:	**Removed**
Tank Capacity:	4000
Tank Substance:	Gasoline
Last Used Date:	12/31/1973
Green Tag Decal:	**U003224**
Green Tag Issue Date:	**7/24/2019**
Green Tag Expire Date:	**12/31/2021**
Motor Fuel Permit Inspection Date:	7/24/2019
Motor Fuel Permit Expiration Date:	12/31/2021
MOTOR FUEL TYPE:	SelfSrv
Pending Nov:	N
Removed Date:	7/23/2003
Tank Number:	3
Tank Status:	**Removed**
Tank Capacity:	4000
Tank Substance:	Gasoline
Last Used Date:	12/31/1973
Green Tag Decal:	**U003224**
Green Tag Issue Date:	**7/24/2019**
Green Tag Expire Date:	**12/31/2021**
Motor Fuel Permit Inspection Date:	7/24/2019

AMM MARATHON, INC. (Continued) **U003907984**

Motor Fuel Permit Expiration Date:	12/31/2021
MOTOR FUEL TYPE:	SelfSrv
Pending Nov:	N
Removed Date:	7/23/2003

Tank Number:	4
Tank Status:	**Removed**
Tank Capacity:	4000
Tank Substance:	Gasoline
Last Used Date:	12/31/1973
Green Tag Decal:	**U003224**
Green Tag Issue Date:	**7/24/2019**
Green Tag Expire Date:	**12/31/2021**
Motor Fuel Permit Inspection Date:	7/24/2019
Motor Fuel Permit Expiration Date:	12/31/2021
MOTOR FUEL TYPE:	SelfSrv
Pending Nov:	N
Removed Date:	7/23/2003

Tank Number:	5
Tank Status:	**Does Not Exist**
Tank Capacity:	6000
Tank Substance:	Gasoline
Green Tag Decal:	**U003224**
Green Tag Issue Date:	**7/24/2019**
Green Tag Expire Date:	**12/31/2021**
Motor Fuel Permit Inspection Date:	7/24/2019
Motor Fuel Permit Expiration Date:	12/31/2021
MOTOR FUEL TYPE:	SelfSrv
Pending Nov:	N

Tank Number:	6
Tank Status:	**Currently in use**
Tank Capacity:	8000
Tank Substance:	Gasoline - Premium
OSFM First Notify Date:	5/21/2004
Install Date:	6/20/2003
Green Tag Decal:	**U003224**
Green Tag Issue Date:	**7/24/2019**
Green Tag Expire Date:	**12/31/2021**
Fee Due:	$0.00
Motor Fuel Permit Inspection Date:	7/24/2019
Motor Fuel Permit Expiration Date:	12/31/2021
MOTOR FUEL TYPE:	SelfSrv
Pending Nov:	N
Equipment Type:	Corrosion Prot - Piping
Equipment:	Fiberglass Non-Corrosive
Last Passing Date:	N/A
Test Expire Date:	N/A

Tank Number:	7
Tank Status:	**Currently in use**
Tank Capacity:	12000

AMM MARATHON, INC. (Continued) **U003907984**

Tank Substance:	Gasoline - Regular
OSFM First Notify Date:	5/21/2004
Install Date:	6/20/2003
Green Tag Decal:	**U003224**
Green Tag Issue Date:	**7/24/2019**
Green Tag Expire Date:	**12/31/2021**
Fee Due:	$0.00
Motor Fuel Permit Inspection Date:	7/24/2019
Motor Fuel Permit Expiration Date:	12/31/2021
MOTOR FUEL TYPE:	SelfSrv
Pending Nov:	N
Equipment Type:	Corrosion Prot - Piping
Equipment:	Fiberglass Non-Corrosive
Last Passing Date:	N/A
Test Expire Date:	N/A

Tank Number:	8
Tank Status:	**Removed**
Tank Capacity:	2000
Tank Substance:	Gasoline
Last Used Date:	12/31/1973
Green Tag Decal:	**U003224**
Green Tag Issue Date:	**7/24/2019**
Green Tag Expire Date:	**12/31/2021**
Motor Fuel Permit Inspection Date:	7/24/2019
Motor Fuel Permit Expiration Date:	12/31/2021
MOTOR FUEL TYPE:	SelfSrv
Pending Nov:	N
Removed Date:	7/23/2003

E23 **TOUMAH, YASSER** **LUST** **S105958696**
WNW **8158 SOUTH HALSTED ST.** **N/A**
1/8-1/4 **CHICAGO, IL 60620**
0.144 mi.
759 ft. **Site 4 of 4 in cluster E**

Relative: LUST:
Lower

Actual:
600 ft.

Name:	TOUMAH, YASSER
Address:	8158 SOUTH HALSTED ST.
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	20031151
IL EPA Id:	316715186
Product:	Gasoline
IEMA Date:	2003-08-04
Project Manager:	Davis
PRP Name:	Yasser Toumah
PRP Address:	10145 South 87th Ave.
PRP City,St,Zip:	Palos Hills, IL 60465
PRP Phone:	7089178072
Section 57.5(g) Letter:	P.A.
Date Section 57.5(g) Letter:	2004-01-13
Heating Oil Date:	2004-01-13

G24 **MORGAN** **RCRA NonGen / NLR** **1001116743**
South **8407 S KERFOOT AVE** **FINDS** **ILR000027680**
1/8-1/4 **CHICAGO, IL 60620** **ECHO**
0.168 mi.
886 ft. **Site 1 of 2 in cluster G**

Relative:
Lower

Actual:
601 ft.

RCRA NonGen / NLR:
Date form received by agency: 2019-12-13 00:00:00.0
Facility name: MORGAN SCHOOL
Facility address: 8407 S KERFOOT AVE
CHICAGO, IL 60620
EPA ID: ILR000027680
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: CHICAGO PUBLIC SCHOOLS 6WN
Owner/operator address: 1819 W PERSHING RD
CHICAGO, IL 60609
Owner/operator telephone: 312-535-7039
Legal status: Municipal
Owner/Operator Type: Owner

Handler Activities Summary:
U.S. importer of hazardous waste: No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 1996-09-17 00:00:00.0
Site name: MORGAN SCHOOL
Classification: Small Quantity Generator

Hazardous Waste Summary:

. Waste code: D008
. Waste name: LEAD

Violation Status: No violations found

FINDS:

Registry ID: 110005948341

Environmental Interest/Information System
ACES (Illinois - Agency Compliance And Enforcement System) is the

MORGAN (Continued) **1001116743**

Illinois EPA Project to facilitate the permitting operations
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1001116743
Registry ID: 110005948341
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110005948341

---

25 North 1/8-1/4 0.174 mi. 918 ft. **NATIONAL CASEIN CO INC** **RCRA NonGen / NLR** **1000260204**
601 W 80TH ST **US AIRS** **ILD005169602**
CHICAGO, IL 60620

Relative: Lower

Actual: 601 ft.

RCRA NonGen / NLR:
Date form received by agency: 2007-11-01 00:00:00.0
Facility name: NATIONAL CASEIN CO INC
Facility address: 601 W 80TH ST
CHICAGO, IL 60620
EPA ID: ILD005169602
Contact: ENV COORDINATOR
Contact country: US
Contact telephone: 773-846-7300
EPA Region: 05
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: NAME NOT REPORTED
Owner/operator address: ADDRESS NOT REPORTED
CITY NOT REPORTED, AK 99998
Owner/operator telephone: 312-555-1212
Legal status: Private
Owner/Operator Type: Operator

Owner/operator name: NATIONAL CASEIN SALES A PARTNERSHIP
Owner/operator address: ADDRESS NOT REPORTED
CITY NOT REPORTED, AK 99998
Owner/operator telephone: 312-555-1212
Legal status: Private
Owner/Operator Type: Owner

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No

NATIONAL CASEIN CO INC (Continued) **1000260204**

Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 1980-08-18 00:00:00.0
Site name: NATIONAL CASEIN CO INC
Classification: Large Quantity Generator

Hazardous Waste Summary:

. Waste code: P090
. Waste name: Not Defined

Violation Status: No violations found

US AIRS MINOR:
Envid: 1000260204
Region Code: 05
Programmatic ID: AIR IL000031600BIN
Facility Registry ID: 110001320749
Primary SIC Code: 2891
NAICS Code: 325520
Default Air Classification Code: MIN
Facility Type of Ownership Code: POF

US AIRS MINOR:
Region Code: 05
Programmatic ID: AIR IL000031600BIN
Facility Registry ID: 110001320749
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2003-08-08 00:00:00
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation

Region Code: 05
Programmatic ID: AIR IL000031600BIN
Facility Registry ID: 110001320749
Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2006-07-13 00:00:00
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation

Region Code: 05
Programmatic ID: AIR IL000031600BIN
Facility Registry ID: 110001320749

NATIONAL CASEIN CO INC (Continued) **1000260204**

Air Operating Status Code: OPR
Default Air Classification Code: MIN
Air Program: State Implementation Plan for National Primary and Secondary Ambient Air Quality Standards
Activity Date: 2011-11-04 00:00:00
Activity Group: Compliance Monitoring
Activity Type: Inspection/Evaluation

H26 **SIMEON VOCATIONAL HIGH SCHOOL** **RCRA-VSQG 1004696763**
East **8235 S VINCENNES AVE** **FINDS ILR000057547**
1/8-1/4 **CHICAGO, IL 60620** **ECHO**
0.178 mi.
938 ft. **Site 1 of 3 in cluster H**

Relative: **Lower**
Actual: **601 ft.**

RCRA-VSQG:
Date form received by agency: 1998-11-04 00:00:00.0
Facility name: SIMEON VOCATIONAL HIGH SCHOOL
Facility address: 8235 S VINCENNES AVE
CHICAGO, IL 60620
EPA ID: ILR000057547
Mailing address: 8501 W 191ST ST
PO BOX 10
MOKENA, IL 60448
Contact: THOMAS CONNELLY
Contact address: 8501 W 191ST ST PO BOX 10
MOKENA, IL 60448
Contact country: US
Contact telephone: 704-923-0202
EPA Region: 05
Classification: Conditionally Exempt Small Quantity Generator
Description: Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:
Owner/operator name: CHICAGO PUBLIC SCHOOLS
Owner/operator address: 1819 W PERSHING RD 6WW
CHICAGO, IL 60609
Owner/operator telephone: 773-535-7038
Legal status: District
Owner/Operator Type: Owner

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No

SIMEON VOCATIONAL HIGH SCHOOL (Continued) **1004696763**

Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Hazardous Waste Summary:

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D009
. Waste name: MERCURY

Violation Status: No violations found

FINDS:

Registry ID: 110003046089

Environmental Interest/Information System

ACES (Illinois - Agency Compliance And Enforcement System) is the Illinois EPA Project to facilitate the permitting operations
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1004696763
Registry ID:	110003046089
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110003046089

H27 **SIMEON SCHOOL** **UST** **U003929759**
East **8233 S VINCENNES** **N/A**
1/8-1/4 **CHICAGO, IL 60620**
0.178 mi.
941 ft. **Site 2 of 3 in cluster H**

Relative: UST:
Lower
Actual: Name: SIMEON SCHOOL
601 ft. Address: 8233 S VINCENNES
City: CHICAGO
Zip: 60620
Facility ID: 2041912
Facility Status: EXEMPT
Facility Type: **SCHOOL/COLLEGE**
Owner Id: U0028539
Owner Name: Public Building Commission of Chicago
Owner Address: 50 W. Washington Street, Suite 200 Richard J. Daley Center
Owner City,St,Zip: Chicago, IL 60602

Tank Number: 1
Tank Status: **Removed**
Tank Capacity: 20000
Tank Substance: Heating Oil
Last Used Date: 12/31/1973
OSFM First Notify Date: 11/17/2003
Pending Nov: N
Removed Date: 10/9/2003

G28 **SUNRISE TRANSPORTATION** **INST CONTROL** **S117530428**
SSE **8500 SOUTH VINCENNES AVENUE** **SRP** **N/A**
1/8-1/4 **CHICAGO, IL 60620** **CHICAGO ENV**
0.181 mi.
957 ft. **Site 2 of 2 in cluster G**

Relative: IL INSTUTIONAL CONTROL:
Lower
Actual: Illinois EPA Id: 316715202
600 ft. NFR Letter: 03/16/2017
Date NFR Recorded: 03/21/2017
Comprehensive / Focused: Comprehensive
Remediation Applicant Name: Paul Losos
RA Company: 8500 Vincennes, LLC
RA Address: 8524 South Vincennes Avenue
RA City,St,Zip: Chicago, IL 60620
Worker Caution: No
Acres: 6.22
Land Use: Industrial/Commercial
Ground Water Use Restriction: Yes
Highway Authority Agreement: No
Ordinance: No
Industrial - Commercial: Yes
Slab on Grade: Yes
BCT: No
Building Slab: No
Asphalt Used: No
Concrete Used: No
Clean Soil 3ft: No
Clean Soil 10ft: No
Alternate Barrier: No

SUNRISE TRANSPORTATION (Continued) **S117530428**

SRP:

IL EPA Id:	316715202
Longitude:	-87.641362
Latitude:	41.740659
Contact Name:	Paul Losos
Contact Address:	8524 South Vincennes Avenue
Contact City,St,Zip:	Chicago, IL 60620
Date Enrolled:	03/31/2016
Point Of Contact:	Catherine Case, P.E.
Consultant Company:	Civil & Environmental Consultants, Inc.
Consultant Address:	555 Butterfield Road
Consultant City,St,Zip:	Lombard, IL 60148
Proj Mgr Assigned:	Todd Gross
Active:	No
Remediation Applicant Co:	8500 Vincennes, LLC

NFRDL:

Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	Yes
Highway Authority A greement:	No
Ordinance:	No
Industrial - Commercial:	Yes
Slab on Grade:	Yes
BCT:	No
Building Slab:	No
Asphalt Used:	No
Concrete Used:	No
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	No
Remediation Applicant Name:	Paul Losos
Remediation Applicant Company:	8500 Vincennes, LLC
Remediation Applicant Address:	8524 South Vincennes Avenue
Remediation Applicant City,St,Zip:	Chicago, IL 60620
Illinois EPA:	316715202
Site Name:	Sunrise Transportation
NFR Letter:	2017-03-16
NFR Letter Date Recorded:	2017-03-21
Comprehensive/Focused:	Comprehensive
Worker Caution:	N
Acres:	6.22

CHICAGO ENV:

Address:	8500 S VINCENNES AVE
City,State,Zip:	CHICAGO, IL
Map Location:	POINT (-87.63969115591303 41.73993498914874)
Complaints:	Y
Inspections:	Y
Latitude:	41.739934989
Longitude:	-87.639691156

H29 **SIMEON CAREER ACADEMY PARKING LOT** **ENG CONTROLS** **S105424227**
East **8221 SOUTH VINCENNES AVENUE** **INST CONTROL** **N/A**
1/8-1/4 **CHICAGO, IL 60620** **SRP**
0.182 mi.
959 ft. **Site 3 of 3 in cluster H**

Relative:
Lower

Actual:
601 ft.

ENGINEERING CONTROLS:

Illinois Epa Id:	316715172
NFR Letter:	08/30/2004
Date NFR Recorded:	09/09/2004
Remediation Applicant Name:	Lynn Crivello
RA Company:	Chicago Public Schools
RA Address:	125 South Clark Street
RA City,St,Zip:	Chicago, IL 60603
Worker Caution:	Yes
Acres:	2.3
Land Use:	Residential or Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	No
Industrial - Commercial:	No
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	No
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes

IL INSTUTIONAL CONTROL:

Illinois EPA Id:	316715172
NFR Letter:	08/30/2004
Date NFR Recorded:	09/09/2004
Remediation Applicant Name:	Lynn Crivello
RA Company:	Chicago Public Schools
RA Address:	125 South Clark Street
RA City,St,Zip:	Chicago, IL 60603
Worker Caution:	Yes
Acres:	2.3
Land Use:	Residential or Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	No
Industrial - Commercial:	No
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	No
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes

SRP:

IL EPA Id:	316715172
Longitude:	-87.635156
Latitude:	41.744751

SIMEON CAREER ACADEMY PARKING LOT (Continued) **S105424227**

Contact Name:	Lynn Crivello
Contact Address:	125 South Clark Street
Contact City,St,Zip:	Chicago, IL 60603
Date Enrolled:	03/18/2002
Point Of Contact:	Michael R. Duet, P.E. Duet
Consultant Company:	Carnow, Conibear & Associates, Ltd.
Consultant Address:	600 West Van Buren Street
Consultant City,St,Zip:	Chicago, IL 60607
Proj Mgr Assigned:	Russell Irwin
Active:	No
Remediation Applicant Co:	Chicago Public Schools

NFRDL:

Effective:	True
Land Use:	Residential or Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	No
Industrial - Commercial:	No
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	No
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Lynn Crivello
Remediation Applicant Company:	Chicago Public Schools
Remediation Applicant Address:	125 South Clark Street
Remediation Applicant City,St,Zip:	Chicago, IL 60603
Illinois EPA:	316715172
Site Name:	Simeon Career Academy Parking Lot
NFR Letter:	2004-08-30
NFR Letter Date Recorded:	2004-09-09
Worker Caution:	Y
Acres:	2.3

I30 **NAOMI & SYLVESTER SMITH SENIOR CENTER** **LUST** **S110685102**
NW **8045 SOUTH HALSTED** **N/A**
1/8-1/4 **CHICAGO, IL 60620**
0.199 mi.
1051 ft. **Site 1 of 3 in cluster I**

Relative: **Lower**

Actual: **595 ft.**

LUST:

Name:	NAOMI & SYLVESTER SMITH SENIOR CENTER
Address:	8045 SOUTH HALSTED
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	20101335
IL EPA Id:	316715234
Product:	Other Petroleum
IEMA Date:	2010-12-09
PRP Name:	Naomi & Sylvester Smith Senior Center
PRP Contact:	Stan Smith
PRP Address:	8130 South Racine
PRP City,St,Zip:	Chicago, IL 60620
PRP Phone:	7084737726

NAOMI & SYLVESTER SMITH SENIOR CENTER (Continued) **S110685102**

Section 57.5(g) Letter: 734

31
East
1/8-1/4
0.203 mi.
1070 ft.

CARDWELL WESTINGHOUSE
433 W 83RD ST
CHICAGO, IL 60620

RCRA-SQG **1000193395**
ILD000821801

Relative:
Lower

Actual:
599 ft.

RCRA-SQG:

Date form received by agency:	2006-04-01 00:00:00.0
Facility name:	CARDWELL WESTINGHOUSE
Facility address:	433 W 83RD ST CHICAGO, IL 60620
EPA ID:	ILD000821801
Contact:	ENV COORDINATOR
Contact country:	US
Contact telephone:	773-483-7575
EPA Region:	05
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	CARDWELL WESTINGHOUSE
Owner/operator country:	US
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	1900-01-01 00:00:00.
Owner/operator name:	CARDWELL WESTINGHOUSE
Owner/operator country:	US
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	1900-01-01 00:00:00.
Owner/operator name:	WESTINGHOUSE AIR BRAKE CO
Owner/operator address:	ADDRESS NOT REPORTED CITY NOT REPORTED, AK 99998
Owner/operator telephone:	312-555-1212
Legal status:	Private
Owner/Operator Type:	Owner
Owner/operator name:	NAME NOT REPORTED
Owner/operator address:	ADDRESS NOT REPORTED CITY NOT REPORTED, AK 99998
Owner/operator telephone:	312-555-1212
Legal status:	Private
Owner/Operator Type:	Operator

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No

CARDWELL WESTINGHOUSE (Continued) **1000193395**

Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 1996-03-01 00:00:00.0
Site name: CARDWELL WESTINGHOUSE
Classification: Large Quantity Generator

Date form received by agency: 1994-03-01 00:00:00.0
Site name: CARDWELL WESTINGHOUSE
Classification: Large Quantity Generator

Date form received by agency: 1992-03-01 00:00:00.0
Site name: CARDWELL WESTINGHOUSE
Classification: Large Quantity Generator

Date form received by agency: 1980-08-18 00:00:00.0
Site name: CARDWELL WESTINGHOUSE
Classification: Large Quantity Generator

Hazardous Waste Summary:

. Waste code: D000
. Waste name: Not Defined

. Waste code: D001
. Waste name: IGNITABLE WASTE

. Waste code: F001
. Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLORETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F017
. Waste name: Not Defined

Violation Status: No violations found

I32 **WITHERSPOON HENRY** **UST** **U003152237**
NW **8054-58 S HALSTED** **N/A**
1/8-1/4 **CHICAGO, IL 60620**
0.228 mi.
1202 ft. **Site 2 of 3 in cluster I**

Relative: UST:
Lower

Actual:
595 ft.

Name:	WITHERSPOON HENRY
Address:	8054-58 S HALSTED
City:	CHICAGO
Zip:	60620
Facility ID:	2031734
Facility Status:	CLOSED
Facility Type:	**OTHER**
Owner Id:	U0021176
Owner Name:	Witherspoon Henry
Owner Address:	4364 S Oakenwald Ave
Owner City,St,Zip:	Chicago, IL 60653
Tank Number:	1
Tank Status:	**Removed**
Tank Capacity:	0
Tank Substance:	Used Oil
Last Used Date:	1/1/1902
OSFM First Notify Date:	2/2/1993
Pending Nov:	N
Removed Date:	3/11/1993

I33 **CONSTRUCTION SITE (FUTURE SENIOR LIVING CENTER)** **UST** **U004162258**
NW **8031-8047 S. HALSTED AVE.** **N/A**
1/8-1/4 **CHICAGO, IL 60620**
0.229 mi.
1208 ft. **Site 3 of 3 in cluster I**

Relative: UST:
Lower

Actual:
596 ft.

Name:	CONSTRUCTION SITE (FUTURE SENIOR LIVING CENTER)
Address:	8031-8047 S. HALSTED AVE.
City:	CHICAGO
Zip:	60620
Facility ID:	2044845
Facility Status:	EXEMPT
Facility Type:	**COMMERCIAL / RETAIL**
Owner Id:	U0036007
Owner Name:	Naomi & Sylvester Smith Living Center
Owner Address:	8031 S. Halsted Ave.
Owner City,St,Zip:	Chicago, IL 60620
Tank Number:	1
Tank Status:	**Removed**
Tank Capacity:	1000
Tank Substance:	Heating Oil
Last Used Date:	12/31/1973
OSFM First Notify Date:	1/10/2011
Pending Nov:	N
IEMA:	10-1335
Removed Date:	12/9/2010
Tank Number:	2
Tank Status:	**Removed**

CONSTRUCTION SITE (FUTURE SENIOR LIVING CENTER) (Continued) **U004162258**

Tank Capacity:	1000
Tank Substance:	Heating Oil
Last Used Date:	12/31/1973
OSFM First Notify Date:	1/10/2011
Pending Nov:	N
Removed Date:	12/9/2010

---

34 **95 HALSTEAD, INC.** **LUST** **S104529205**
SW **8420 SOUTH HALSTED** **N/A**
1/8-1/4 **CHICAGO, IL 60620**
0.234 mi.
1235 ft.

Relative:
Higher

Actual:
606 ft.

LUST:

Name:	95 HALSTEAD, INC.
Address:	8420 SOUTH HALSTED
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	982801
IL EPA Id:	316715137
Product:	Gasoline, Other Petroleum
IEMA Date:	1998-11-12
Project Manager:	McGill
Project Manager Phone:	(217) 524-5137
Email:	Scott.McGill@illinois.gov
PRP Name:	95 Halstead, Inc.
PRP Contact:	Eugene Faicus
PRP Address:	400 Skokie Blvd, Suite 415
PRP City,St,Zip:	Northbrook, IL 60062
PRP Phone:	8472055554
Section 57.5(g) Letter:	732
20 Report Received:	1999-02-18
45 Report Received:	1999-02-18
NFA/NFR Letter:	**1999-08-23**
NFR Date Recorded:	1999-12-29

J35 **81ST/VINCENNES AVE** **IL NIPC** **S100790178**
NE **N/A**
1/8-1/4 **CHICAGO, IL**
0.240 mi.
1267 ft. **Site 1 of 2 in cluster J**

Relative:
Lower

Actual:
595 ft.

K36 **SUNRISE BUS AND CHARTER - TANK#2-1,000** **AST** **A100394906**
South **8512 SOUTH** **N/A**
1/8-1/4 **VINCENNES CHICAGO, IL 60620**
0.243 mi.
1281 ft. **Site 1 of 2 in cluster K**

Relative:
Higher

Actual:
602 ft.

AST:

Name:	SUNRISE BUS AND CHARTER - TANK#2-1,000
Address:	8512 SOUTH
City,State,Zip:	VINCENNES CHICAGO, IL 60620

SUNRISE BUS AND CHARTER - TANK#2-1,000 (Continued) **A100394906**

City,State,Zip:	VINCENNES CHICAGO, IL 60620
Occupancy Number:	-001-CS-052
Occupant Type:	052 - LP TANKS, CONTAINER FILLING
Section Number:	CS
Property Owner Name:	SUNRISE BUS AND CHARTER
Type:	LPG TANK

K37 **SUNRISE BUS AND CHARTER TANK#1-1,000** **AST** **A100394907**
South **8512 SOUTH** **N/A**
1/8-1/4 **VINCENNES CHICAGO, IL 60620**
0.243 mi.
1281 ft. **Site 2 of 2 in cluster K**

Relative: **Higher**
Actual: **602 ft.**

AST:

Name:	SUNRISE BUS AND CHARTER TANK#1-1,000
Address:	8512 SOUTH
City,State,Zip:	VINCENNES CHICAGO, IL 60620
City,State,Zip:	VINCENNES CHICAGO, IL 60620
Occupancy Number:	-001-CS-052
Occupant Type:	052 - LP TANKS, CONTAINER FILLING
Section Number:	CS
Property Owner Name:	SUNRISE BUS AND CHARTER
Type:	LPG TANK

---

38 **NEW PISGAH BAPTIST CHURCH** **SRP** **S109143370**
NNW **8019-8047 SOUTH HALSTED STREET** **N/A**
1/8-1/4 **CHICAGO, IL 60620**
0.248 mi.
1307 ft.

Relative: **Lower**
Actual: **596 ft.**

SRP:

IL EPA Id:	316715219
Longitude:	-87.643625
Latitude:	41.747917
Contact Name:	Stanley Smith
Contact Address:	8130 South Racine Avenue
Contact City,St,Zip:	Chicago, IL 60620
Date Enrolled:	06/27/2008
Point Of Contact:	Matthew Hildreth
Consultant Company:	AECOM
Consultant Address:	27755 Diehl Road
Consultant City,St,Zip:	Warrenville, IL 60555-3998
Proj Mgr Assigned:	Barb Landers
Active:	No
Remediation Applicant Co:	New Pisgah Baptist Church

NFRDL:

Effective:	True
Land Use:	Residential or Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	No
Industrial - Commercial:	No
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	No

NEW PISGAH BAPTIST CHURCH (Continued) **S109143370**

Concrete Used:	No
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	No
Remediation Applicant Name:	Stanley Smith
Remediation Applicant Company:	New Pisgah Baptist Church
Remediation Applicant Address:	8130 South Racine Avenue
Remediation Applicant City,St,Zip:	Chicago, IL 60620
Illinois EPA:	316715219
Site Name:	New Pisgah Baptist Church
NFR Letter:	2012-10-11
NFR Letter Date Recorded:	2012-10-18
Comprehensive/Focused:	Comprehensive
Worker Caution:	N
Acres:	0.98

J39 **SIMEON VOCATIONAL HIGH SCHOOL** **SRP** **S104562071**
NE **8101 SOUTH VINCENNES AVENUE** **N/A**
1/4-1/2 **CHICAGO, IL 60620**
0.252 mi.
1332 ft. **Site 2 of 2 in cluster J**

Relative: SRP:
Lower

IL EPA Id:	316715134
US EPA Id:	ILR000057547
Longitude:	-87.634834
Latitude:	41.746099
Contact Name:	Timothy Martin
Contact Address:	125 South Clark Street
Contact City,St,Zip:	Chicago, IL 60603
Date Enrolled:	07/11/2000
Point Of Contact:	Ala E. Sassila, P.E.
Consultant Company:	Carnow, Conibear & Associates, Ltd.
Consultant Address:	600 West Van Buren Street
Consultant City,St,Zip:	Chicago, IL 60607
Proj Mgr Assigned:	Russell Irwin
Active:	No
Remediation Applicant Co:	Chicago Public Schools

Actual: NFRDL:
594 ft.

Effective:	True
Land Use:	Residential or Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	No
Industrial - Commercial:	No
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	No
Concrete Used:	No
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	No
Remediation Applicant Name:	Timothy Martin
Remediation Applicant Company:	Chicago Public Schools
Remediation Applicant Address:	125 South Clark Street

SIMEON VOCATIONAL HIGH SCHOOL (Continued) **S104562071**

Remediation Applicant City,St,Zip:	Chicago, IL 60603
Illinois EPA:	316715134
Site Name:	Simeon Vocational High School
NFR Letter:	2002-04-23
NFR Letter Date Recorded:	2002-05-17
Comprehensive/Focused:	Comprehensive
Worker Caution:	N
Acres:	4.12

40
NNW
1/4-1/2
0.275 mi.
1453 ft.

80TH/EMERALD AVE **IL NIPC** **S100790181**
CHICAGO, IL **N/A**

Relative:
Lower

Actual:
598 ft.

L41
ESE
1/4-1/2
0.278 mi.
1466 ft.

CARDELL WESTINGHOUSE **LUST** **S103687677**
8400 SOUTH STUART **N/A**
CHICAGO, IL 60620

Site 1 of 2 in cluster L

Relative:
Lower

Actual:
592 ft.

LUST:

Name:	CARDELL WESTINGHOUSE
Address:	8400 SOUTH STUART
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	982540
IL EPA Id:	316005774
Product:	Fuel Oil
IEMA Date:	1998-10-12
Project Manager:	Eppley
PRP Name:	Cardwell Westinghouse
PRP Contact:	Pete Loonan
PRP Address:	8400 South Stuart
PRP City,St,Zip:	Chicago, IL 60620
PRP Phone:	3124837575
Section 57.5(g) Letter:	732
Date Section 57.5(g) Letter:	1999-02-02
Heating Oil Date:	1999-02-02

42
ESE
1/4-1/2
0.284 mi.
1501 ft.

W2005 CMK REALTY L.L.C. **LUST** **S106346397**
8301 SOUTH STEWART **ENG CONTROLS** **N/A**
CHICAGO, IL 60620 **INST CONTROL**
SRP

Relative:
Lower

Actual:
590 ft.

LUST:

Name:	W2005 CMK REALTY L.L.C.
Address:	8301 SOUTH STEWART
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	20060081

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

IL EPA Id:	316006052
Product:	Gasoline, Diesel
IEMA Date:	2006-01-23
PRP Name:	W2005 CMK Realty L.L.C.
PRP Contact:	Doug Romer
PRP Address:	600 East Wlascolinas Boulevard
PRP City,St,Zip:	Irving, TX 75039
PRP Phone:	9723682428
Section 57.5(g) Letter:	734
20 Report Received:	2006-06-28
45 Report Received:	2006-06-28
NFR Date Recorded:	2014-07-23

Name:	W2005 CMK REALTY L.L.C.
Address:	8301 SOUTH STEWART
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	20060483
IL EPA Id:	316006052
Product:	Fuel Oil
IEMA Date:	2006-04-21
PRP Name:	W2005 CMK Realty L.L.C.
PRP Contact:	Doug Romer
PRP Address:	600 East Los Colinas Boulevard, Suite 400
PRP City,St,Zip:	Irving, TX 75039
PRP Phone:	9723682428
Section 57.5(g) Letter:	734
20 Report Received:	2006-06-28
45 Report Received:	2006-06-28
NFR Date Recorded:	2009-09-17

ENGINEERING CONTROLS:

Illinois Epa Id:	316006052
NFR Letter:	08/12/2009
Date NFR Recorded:	09/17/2009
Comprehensive / Focused:	Comprehensive
Remediation Applicant Name:	Douglas Romer
RA Company:	W2005 CMK Realty, L.L.C.
RA Address:	6011 Connection Drive
RA City,St,Zip:	Irving, TX 75039
Worker Caution:	Yes
Acres:	2.5
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	No
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	No

Illinois Epa Id:	316006052
NFR Letter:	06/14/2011

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Date NFR Recorded:	06/24/2011
Comprehensive / Focused:	Comprehensive
Remediation Applicant Name:	Thomas Brashler
RA Company:	W2005 CMK Realty, L.L.C.
RA Address:	30 West Monroe Street
RA City,St,Zip:	Chicago, IL 75039
Worker Caution:	Yes
Acres:	1.19
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes

Illinois Epa Id:	316006052
NFR Letter:	06/14/2011
Date NFR Recorded:	06/24/2011
Comprehensive / Focused:	Comprehensive
Remediation Applicant Name:	Thomas Brashler
RA Company:	W2005 CMK Realty, L.L.C.
RA Address:	30 West Monroe Street
RA City,St,Zip:	Chicago, IL 75039
Worker Caution:	Yes
Acres:	1.72
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No
Alternate Barrier:	Yes

Illinois Epa Id:	316006052
NFR Letter:	12/24/2012
Date NFR Recorded:	02/04/2013
Comprehensive / Focused:	Comprehensive
Remediation Applicant Name:	Thomas Brashler
RA Company:	W2005 CMK Realty, L.L.C.
RA Address:	30 West Monroe Street
RA City,St,Zip:	Chicago, IL 75039
Worker Caution:	Yes
Acres:	13.69
Land Use:	Industrial/Commercial

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Ground Water Use Restriction: No
Highway Authority Agreement: No
Ordinance: Yes
Industrial - Commercial: Yes
Slab on Grade: No
BCT: No
Building Slab: Yes
Asphalt Used: Yes
Concrete Used: Yes
Clean Soil 3ft: Yes
Clean Soil 10ft: No
Alternate Barrier: Yes

Illinois Epa Id: 316006052
NFR Letter: 05/19/2009
Date NFR Recorded: 07/06/2009
Comprehensive / Focused: Comprehensive
Remediation Applicant Name: Douglas Romer
RA Company: W2005 CMK Realty, L.L.C.
RA Address: 6011 Connection Drive
RA City,St,Zip: Irving, TX 75039
Worker Caution: Yes
Acres: 4.1
Land Use: Industrial/Commercial
Ground Water Use Restriction: No
Highway Authority Agreement: No
Ordinance: Yes
Industrial - Commercial: Yes
Slab on Grade: No
BCT: No
Building Slab: Yes
Asphalt Used: Yes
Concrete Used: Yes
Clean Soil 3ft: No
Clean Soil 10ft: No
Alternate Barrier: Yes

Illinois Epa Id: 316006052
NFR Letter: 09/11/2008
Date NFR Recorded: 10/22/2008
Comprehensive / Focused: Comprehensive
Remediation Applicant Name: Douglas Romer
RA Company: W2005 CMK Realty, L.L.C.
RA Address: 6011 Connection Drive
RA City,St,Zip: Irving, TX 75039
Worker Caution: Yes
Acres: 11.5
Land Use: Industrial/Commercial
Ground Water Use Restriction: No
Highway Authority Agreement: No
Ordinance: Yes
Industrial - Commercial: Yes
Slab on Grade: No
BCT: No
Building Slab: No
Asphalt Used: Yes
Concrete Used: Yes

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Clean Soil 3ft: Yes
Clean Soil 10ft: No
Alternate Barrier: Yes

Illinois Epa Id: 316006052
NFR Letter: 07/11/2014
Date NFR Recorded: 07/23/2014
Comprehensive / Focused: Comprehensive
Remediation Applicant Name: Thomas Brashler
RA Company: W2005 CMK Realty. L.L.C.
RA Address: 6 East Monroe Street
RA City,St,Zip: Chicago, IL 75039
Worker Caution: Yes
Acres: 0.8
Land Use: Industrial/Commercial
Ground Water Use Restriction: No
Highway Authority Agreement: No
Ordinance: Yes
Industrial - Commercial: Yes
Slab on Grade: Yes
BCT: No
Building Slab: Yes
Asphalt Used: Yes
Concrete Used: Yes
Clean Soil 3ft: No
Clean Soil 10ft: No
Alternate Barrier: Yes

IL INSTUTIONAL CONTROL:
Illinois EPA Id: 316006052
NFR Letter: 08/12/2009
Date NFR Recorded: 09/17/2009
Comprehensive / Focused: Comprehensive
Remediation Applicant Name: Douglas Romer
RA Company: W2005 CMK Realty, L.L.C.
RA Address: 6011 Connection Drive
RA City,St,Zip: Irving, TX 75039
Worker Caution: Yes
Acres: 2.5
Land Use: Industrial/Commercial
Ground Water Use Restriction: No
Highway Authority Agreement: No
Ordinance: Yes
Industrial - Commercial: Yes
Slab on Grade: No
BCT: No
Building Slab: Yes
Asphalt Used: No
Concrete Used: Yes
Clean Soil 3ft: No
Clean Soil 10ft: No
Alternate Barrier: No

Illinois EPA Id: 316006052
NFR Letter: 06/14/2011
Date NFR Recorded: 06/24/2011
Comprehensive / Focused: Comprehensive

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Remediation Applicant Name:	Thomas Brashler
RA Company:	W2005 CMK Realty, L.L.C.
RA Address:	30 West Monroe Street
RA City,St,Zip:	Chicago, IL 75039
Worker Caution:	Yes
Acres:	1.19
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes

Illinois EPA Id:	316006052
NFR Letter:	06/14/2011
Date NFR Recorded:	06/24/2011
Comprehensive / Focused:	Comprehensive
Remediation Applicant Name:	Thomas Brashler
RA Company:	W2005 CMK Realty, L.L.C.
RA Address:	30 West Monroe Street
RA City,St,Zip:	Chicago, IL 75039
Worker Caution:	Yes
Acres:	1.72
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No
Alternate Barrier:	Yes

Illinois EPA Id:	316006052
NFR Letter:	12/24/2012
Date NFR Recorded:	02/04/2013
Comprehensive / Focused:	Comprehensive
Remediation Applicant Name:	Thomas Brashler
RA Company:	W2005 CMK Realty, L.L.C.
RA Address:	30 West Monroe Street
RA City,St,Zip:	Chicago, IL 75039
Worker Caution:	Yes
Acres:	13.69
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No
Alternate Barrier:	Yes

Illinois EPA Id:	316006052
NFR Letter:	05/19/2009
Date NFR Recorded:	07/06/2009
Comprehensive / Focused:	Comprehensive
Remediation Applicant Name:	Douglas Romer
RA Company:	W2005 CMK Realty, L.L.C.
RA Address:	6011 Connection Drive
RA City,St,Zip:	Irving, TX 75039
Worker Caution:	Yes
Acres:	4.1
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes

Illinois EPA Id:	316006052
NFR Letter:	09/11/2008
Date NFR Recorded:	10/22/2008
Comprehensive / Focused:	Comprehensive
Remediation Applicant Name:	Douglas Romer
RA Company:	W2005 CMK Realty, L.L.C.
RA Address:	6011 Connection Drive
RA City,St,Zip:	Irving, TX 75039
Worker Caution:	Yes
Acres:	11.5
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Alternate Barrier:	Yes
Illinois EPA Id:	316006052
NFR Letter:	07/11/2014
Date NFR Recorded:	07/23/2014
Comprehensive / Focused:	Comprehensive
Remediation Applicant Name:	Thomas Brashler
RA Company:	W2005 CMK Realty. L.L.C.
RA Address:	6 East Monroe Street
RA City,St,Zip:	Chicago, IL 75039
Worker Caution:	Yes
Acres:	0.8
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	Yes
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes

SRP:

IL EPA Id:	316006052
US EPA Id:	IL0000086496
Longitude:	-87.631683
Latitude:	41.742366
Contact Name:	Thomas Brashler
Contact Address:	6 East Monroe Street
Contact City,St,Zip:	Chicago, IL 60603
Date Enrolled:	02/13/2004
Point Of Contact:	Mark Santangelo
Consultant Company:	Pioneer Engineering & Environmental Services, Inc.
Consultant Address:	700 North Sacramento Boulevard
Consultant City,St,Zip:	Chicago, IL 60612
Proj Mgr Assigned:	Rhett Rossi
Active:	Yes
Remediation Applicant Co:	W2005 CMK Realty, L.L.C.

NFRDL:

Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	No
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Alternate Barrier:	No
Remediation Applicant Name:	Douglas Romer
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	6011 Connection Drive
Remediation Applicant City,St,Zip:	Irving, TX 75039
Illinois EPA:	316006052
Site Name:	Ryerson -Detention Ponds #1 and #2
NFR Letter:	2009-08-12
NFR Letter Date Recorded:	2009-09-17
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	2.5
Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Douglas Romer
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	6011 Connection Drive
Remediation Applicant City,St,Zip:	Irving, TX 75039
Illinois EPA:	316006052
Site Name:	Ryerson Parcels C, D, and G
NFR Letter:	2009-05-19
NFR Letter Date Recorded:	2009-07-06
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	4.1
Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	30 West Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Illinois EPA:	316006052
Site Name:	Ryerson Parcel G
NFR Letter:	2011-06-14
NFR Letter Date Recorded:	2011-06-24
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	1.72
Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	30 West Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039
Illinois EPA:	316006052
Site Name:	Ryerson Parcel G
NFR Letter:	2011-06-14
NFR Letter Date Recorded:	2011-06-24
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	1.72
Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	30 West Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039
Illinois EPA:	316006052
Site Name:	Ryerson Parcel C
NFR Letter:	2011-06-14
NFR Letter Date Recorded:	2011-06-24
Comprehensive/Focused:	Comprehensive

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Worker Caution:	Y
Acres:	1.19
Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	30 West Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039
Illinois EPA:	316006052
Site Name:	Ryerson Parcel C
NFR Letter:	2011-06-14
NFR Letter Date Recorded:	2011-06-24
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	1.19
Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	30 West Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039
Illinois EPA:	316006052
Site Name:	Ryerson Parcel J
NFR Letter:	2012-12-24
NFR Letter Date Recorded:	2013-02-04
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	13.69
Effective:	True
Land Use:	Industrial/Commercial

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	Yes
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty. L.L.C.
Remediation Applicant Address:	6 East Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039
Illinois EPA:	316006052
Site Name:	Ryerson-Parcel E2
NFR Letter:	2014-07-11
NFR Letter Date Recorded:	2014-07-23
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	0.8

Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Douglas Romer
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	6011 Connection Drive
Remediation Applicant City,St,Zip:	Irving, TX 75039
Illinois EPA:	316006052
Site Name:	Ryerson-Lowes Parcel
NFR Letter:	2008-09-11
NFR Letter Date Recorded:	2008-10-22
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	11.5

IL EPA Id:	316006052
US EPA Id:	IL0000086496
Longitude:	-87.631683
Latitude:	41.742366
Contact Name:	Thomas Brashler
Contact Address:	6 East Monroe Street

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Contact City,St,Zip:	Chicago, IL 60603
Date Enrolled:	02/13/2004
Point Of Contact:	Mark Santangelo
Consultant Company:	Pioneer Engineering & Environmental Services, Inc.
Consultant Address:	700 North Sacramento Boulevard
Consultant City,St,Zip:	Chicago, IL 60612
Proj Mgr Assigned:	Rhett Rossi
Active:	Yes
Remediation Applicant Co:	W2005 CMK Realty, L.L.C.

NFRDL:

Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	No
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	No
Remediation Applicant Name:	Douglas Romer
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	6011 Connection Drive
Remediation Applicant City,St,Zip:	Irving, TX 75039
Illinois EPA:	316006052
Site Name:	Ryerson -Detention Ponds #1 and #2
NFR Letter:	2009-08-12
NFR Letter Date Recorded:	2009-09-17
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	2.5

Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Douglas Romer
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	6011 Connection Drive
Remediation Applicant City,St,Zip:	Irving, TX 75039
Illinois EPA:	316006052
Site Name:	Ryerson Parcels C, D, and G
NFR Letter:	2009-05-19

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

NFR Letter Date Recorded:	2009-07-06
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	4.1
Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	30 West Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039
Illinois EPA:	316006052
Site Name:	Ryerson Parcel G
NFR Letter:	2011-06-14
NFR Letter Date Recorded:	2011-06-24
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	1.72
Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	30 West Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039
Illinois EPA:	316006052
Site Name:	Ryerson Parcel G
NFR Letter:	2011-06-14
NFR Letter Date Recorded:	2011-06-24
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	1.72

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	30 West Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039
Illinois EPA:	316006052
Site Name:	Ryerson Parcel C
NFR Letter:	2011-06-14
NFR Letter Date Recorded:	2011-06-24
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	1.19

Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	30 West Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039
Illinois EPA:	316006052
Site Name:	Ryerson Parcel C
NFR Letter:	2011-06-14
NFR Letter Date Recorded:	2011-06-24
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	1.19

Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	30 West Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039
Illinois EPA:	316006052
Site Name:	Ryerson Parcel J
NFR Letter:	2012-12-24
NFR Letter Date Recorded:	2013-02-04
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	13.69

Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	Yes
BCT:	No
Building Slab:	Yes
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Thomas Brashler
Remediation Applicant Company:	W2005 CMK Realty. L.L.C.
Remediation Applicant Address:	6 East Monroe Street
Remediation Applicant City,St,Zip:	Chicago, IL 75039
Illinois EPA:	316006052
Site Name:	Ryerson-Parcel E2
NFR Letter:	2014-07-11
NFR Letter Date Recorded:	2014-07-23
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	0.8

Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	Yes

W2005 CMK REALTY L.L.C. (Continued) **S106346397**

Concrete Used:	Yes
Clean Soil 3ft:	Yes
Clean Soil 10ft:	No
Alternate Barrier:	Yes
Remediation Applicant Name:	Douglas Romer
Remediation Applicant Company:	W2005 CMK Realty, L.L.C.
Remediation Applicant Address:	6011 Connection Drive
Remediation Applicant City,St,Zip:	Irving, TX 75039
Illinois EPA:	316006052
Site Name:	Ryerson-Lowes Parcel
NFR Letter:	2008-09-11
NFR Letter Date Recorded:	2008-10-22
Comprehensive/Focused:	Comprehensive
Worker Caution:	Y
Acres:	11.5

L43 **DEPAUL BUILDERS** **SRP S117679230**
ESE **8500 SOUTH STEWART AVENUE** **BOL N/A**
1/4-1/2 **CHICAGO, IL 60620**
0.295 mi.
1556 ft. **Site 2 of 2 in cluster L**

Relative: **Lower**
Actual: **591 ft.**

SRP:

IL EPA Id:	316715261
Longitude:	-87.636176
Latitude:	41.741514
Contact Name:	Patrick Daniel Daly
Contact Address:	10820 Drew Street
Contact City,St,Zip:	Chicago, IL 60643
Date Enrolled:	02/23/2015
Point Of Contact:	Jason Warren
Consultant Company:	ECS Midwest, LLC
Consultant Address:	1575 Barclay Boulevard
Consultant City,St,Zip:	Buffalo Grove, IL 60089
Proj Mgr Assigned:	Jennifer Seul
Active:	Yes
Remediation Applicant Co:	DePaul Builders

BOL:

Name:	DEPAUL BUILDERS
Address:	8500 S STEWART AVE
City,State,Zip:	CHICAGO, IL 60620
Site Id:	170002082172
Inv Num:	0316715261
Interest Name:	Depaul Builders
Interest Type:	BOL
Media Code:	LAND
Latitude:	41.741514
Longitude:	-87.636176

44
SSW
1/4-1/2
0.317 mi.
1673 ft.

CHICAGO, CITY OF
8501 SOUTH GREEN STREET
CHICAGO, IL 60620

LUST **S109953575**
N/A

Relative:
Lower

Actual:
601 ft.

LUST:

Name:	CHICAGO, CITY OF
Address:	8501 SOUTH GREEN STREET
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	932366
IL EPA Id:	316715065
Product:	Gasoline
IEMA Date:	1993-09-02
Project Manager:	Dilbaitis
Project Manager Phone:	(217) 785-8378
Email:	Bradley.Dilbaitis@illinois.gov
PRP Name:	City of Chicago
PRP Contact:	Richard Bolger
PRP Address:	1685 North Throop St.
PRP City,St,Zip:	Chicago, IL 60622
Section 57.5(g) Letter:	734
20 Report Received:	1993-10-06
45 Report Received:	1993-12-17

M45
East
1/4-1/2
0.357 mi.
1885 ft.

KEMMERER BOTTLING
300 WEST 83RD STREET
CHICAGO, IL 60620

Site 1 of 2 in cluster M

LUST **S104527482**
N/A

Relative:
Lower

Actual:
593 ft.

LUST:

Name:	KEMMERER BOTTLING
Address:	300 WEST 83RD STREET
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	892265
IL EPA Id:	316715026
Product:	Unleaded Gas
IEMA Date:	1989-11-07
Project Manager:	Harris
PRP Name:	Kemmerer Bottling
PRP Contact:	John Kenney
PRP Address:	777 Joyce Rd.
PRP City,St,Zip:	Joliet, IL 60436
Section 57.5(g) Letter:	731
20 Report Received:	1992-02-29
45 Report Received:	1992-02-29
NFA/NFR Letter:	**1993-10-06**

46
NE
1/4-1/2
0.362 mi.
1909 ft.

HILL, JOHN
7936 SOUTH VINCENNES
CHICAGO, IL 60620

LUST **S104522636**
N/A

Relative:
Lower

Actual:
595 ft.

LUST:

Name:	HILL, JOHN
Address:	7936 SOUTH VINCENNES
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	950607
IL EPA Id:	316715074
Product:	Gasoline
IEMA Date:	1995-03-27
Project Manager:	Harlow
PRP Name:	John Hill
PRP Address:	7936 South Vincennes
PRP City,St,Zip:	Chicago, IL 60620
Section 57.5(g) Letter:	732
20 Report Received:	1996-11-22
45 Report Received:	1996-11-22
NFA/NFR Letter:	**1997-03-21**
NFR Date Recorded:	1997-03-21

M47
East
1/4-1/2
0.388 mi.
2051 ft.

PRINCETON & SMITH, INC.
8233 SOUTH PRINCETON AVENUE
CHICAGO, IL 60620

Site 2 of 2 in cluster M

LUST **S112205214**
ENG CONTROLS **N/A**
INST CONTROL
SRP
SPILLS

Relative:
Lower

Actual:
591 ft.

LUST:

Name:	PRINCETON & SMITH, INC.
Address:	8233 SOUTH PRINCETON AVENUE
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	20120948
IL EPA Id:	316715244
Product:	Other Petroleum
IEMA Date:	2012-09-07
PRP Name:	Princeton & Smith, Inc.
PRP Contact:	Kirby Smith
PRP Address:	15020 South Ravinia Avenue, Suite 20
PRP City,St,Zip:	Orland Park, IL 60462
PRP Phone:	7082680799
Section 57.5(g) Letter:	734
20 Report Received:	2012-10-01
45 Report Received:	2012-10-26

ENGINEERING CONTROLS:

Illinois Epa Id:	316715244
NFR Letter:	03/05/2013
Date NFR Recorded:	04/11/2013
Comprehensive / Focused:	Focused
Remediation Applicant Name:	Kirby Smith
RA Company:	Princeton & Smith, Inc.
RA Address:	15020 South Ravibia Avenue
RA City,St,Zip:	Orland Park, IL 60462
Worker Caution:	Yes
Acres:	2
Land Use:	Industrial/Commercial

PRINCETON & SMITH, INC. (Continued) **S112205214**

Ground Water Use Restriction: No
Highway Authority Agreement: No
Ordinance: Yes
Industrial - Commercial: Yes
Slab on Grade: No
BCT: No
Building Slab: No
Asphalt Used: No
Concrete Used: Yes
Clean Soil 3ft: No
Clean Soil 10ft: No
Alternate Barrier: No

IL INSTUTIONAL CONTROL:
Illinois EPA Id: 316715244
NFR Letter: 03/05/2013
Date NFR Recorded: 04/11/2013
Comprehensive / Focused: Focused
Remediation Applicant Name: Kirby Smith
RA Company: Princeton & Smith, Inc.
RA Address: 15020 South Ravibia Avenue
RA City,St,Zip: Orland Park, IL 60462
Worker Caution: Yes
Acres: 2
Land Use: Industrial/Commercial
Ground Water Use Restriction: No
Highway Authority Agreement: No
Ordinance: Yes
Industrial - Commercial: Yes
Slab on Grade: No
BCT: No
Building Slab: No
Asphalt Used: No
Concrete Used: Yes
Clean Soil 3ft: No
Clean Soil 10ft: No
Alternate Barrier: No

SRP:
IL EPA Id: 316715244
Longitude: -87.630913
Latitude: 41.744248
Contact Name: Kirby Smith
Contact Address: 15020 South Ravinia Avenue
Contact City,St,Zip: Orland Park, IL 60462
Date Enrolled: 10/25/2012
Point Of Contact: Steven C. Anderson
Consultant Company: Anderson Environmental Consulting, Inc.
Consultant Address: 6655 Main Street
Consultant City,St,Zip: Downers Grove, IL 60516
Proj Mgr Assigned: Max Twum
Active: No
Remediation Applicant Co: Princeton & Smith, Inc.

NFRDL:
Effective: True
Land Use: Industrial/Commercial

PRINCETON & SMITH, INC. (Continued) **S112205214**

Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	No
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	No
Remediation Applicant Name:	Kirby Smith
Remediation Applicant Company:	Princeton & Smith, Inc.
Remediation Applicant Address:	15020 South Ravibia Avenue
Remediation Applicant City,St,Zip:	Orland Park, IL 60462
Illinois EPA:	316715244
Site Name:	Princeton & Smith, Inc.
NFR Letter:	2013-03-05
NFR Letter Date Recorded:	2013-04-11
Comprehensive/Focused:	Focused
Worker Caution:	Y
Acres:	2

SPILLS:

City,State,Zip:	CHICAGO, IL
Incident ID:	NL870199
Date Received:	02/10/1987
Facility Address:	8233 PRINCETON
Facility City:	CHICAGO
PRP Name:	ECONOMIC LABORATORIES
Source Table:	dbo_OCIN_INDCIDENTHIS

---

48 **BP SERVICE STATION #5110, FORMER** **LUST** **S117531014**
SSW **8654 VINCENNES AVENUE** **CHICAGO ENV** **N/A**
1/4-1/2 **CHICAGO, IL 60620**
0.403 mi.
2129 ft.

Relative:
Higher

Actual:
606 ft.

LUST:

Name:	BP SERVICE STATION #5110, FORMER
Address:	8654 VINCENNES AVENUE
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	20031456
IL EPA Id:	316715187
Product:	Unleaded Gas, Other Petroleum
IEMA Date:	2003-10-03
Project Manager:	Putrich
Project Manager Phone:	(217) 524-4827
Email:	Steve.Putrich@illinois.gov
PRP Name:	BP Products North America, Inc.
PRP Contact:	Jim L. Smith
PRP Address:	201 Helios Way, 6th Floor
PRP City,St,Zip:	Houston, TX 77079
PRP Phone:	(832) 619-3585
Section 57.5(g) Letter:	734

BP SERVICE STATION #5110, FORMER (Continued) **S117531014**

20 Report Received:	2003-10-15
45 Report Received:	2003-11-19
NFA/NFR Letter:	**2019-06-28**
NFR Date Recorded:	2019-07-09
Name:	MOHSIN, MOHAMMED
Address:	8654 VINCENNES AVENUE
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	20091414
IL EPA Id:	316715187
Product:	Gasoline
IEMA Date:	2009-12-21
Project Manager:	Putrich
Project Manager Phone:	(217) 524-4827
Email:	Steve.Putrich@illinois.gov
PRP Name:	Mohammed Mohsin
PRP Address:	9148 Falcon Ridge Drive
PRP City,St,Zip:	Bridgeview, IL 60455
PRP Phone:	7739317026
Section 57.5(g) Letter:	734

CHICAGO ENV:

Address:	8654 S VINCENNES AVE
City,State,Zip:	CHICAGO, IL
Map Location:	POINT (-87.64360921112505 41.73746994211893)
Inspections:	Y
Permits:	Y
Tanks:	Y
Holds and Lust Nfr:	Y
Latitude:	41.737469942
Longitude:	-87.643609211
Address:	8654 S VINCENNES AVE
City,State,Zip:	CHICAGO, IL
Map Location:	POINT (-87.64360921112505 41.73746994211893)
Inspections:	Y
Permits:	Y
Tanks:	Y
Holds and Lust Nfr:	Y
Latitude:	41.737469942
Longitude:	-87.643609211

---

49 **AUBURN LAKES VENTURE** **LUST** **S104967902**
NNE **7851 NORMAL ST** **BOL** **N/A**
1/4-1/2 **CHICAGO, IL 60620**
0.417 mi.
2203 ft.

Relative: **Lower**

Actual: **596 ft.**

LUST:

Name:	AUBURN LAKES VENTURE
Address:	7851 NORMAL ST.
City,State,Zip:	CHICAGO, IL 60620
Incident Num:	20010319
IL EPA Id:	316715160
Product:	Fuel Oil
IEMA Date:	2001-02-22
Project Manager:	Tucka

AUBURN LAKES VENTURE (Continued) **S104967902**

PRP Name: Auburn Lakes Venture
PRP Contact: Tim Lagos
PRP Address: P.O. Box 683
PRP City,St,Zip: Matteson, IL 60443
PRP Phone: 7082543552
Section 57.5(g) Letter: 732
Date Section 57.5(g) Letter: 2001-06-21
Heating Oil Date: 2001-06-21

BOL:
Name: AUBURN LAKES VENTURE
Address: 7851 NORMAL ST
City,State,Zip: CHICAGO, IL 60620
Site Id: 170000539184
Inv Num: 0316715160
Interest Name: Auburn Lakes Venture
Interest Type: BOL
Media Code: LAND
Latitude: 41.751180
Longitude: -87.636780

Name: AUBURN LAKES VENTURE
Address: 7851 NORMAL ST
City,State,Zip: CHICAGO, IL 60620
Site Id: 170000539184
Inv Num: 0316715160
Interest Name: Auburn Lakes Venture
Interest Type: LUST
Media Code: LAND
Latitude: 41.751180
Longitude: -87.636780

Name: AUBURN LAKES VENTURE
Address: 7851 NORMAL ST
City,State,Zip: CHICAGO, IL 60620
Site Id: 170000539184
Inv Num: 0316715160
Interest Name: Auburn Lakes Venture
Interest Type: SOLID WASTE
Media Code: LAND
Latitude: 41.751180
Longitude: -87.636780

50
East
1/4-1/2
0.418 mi.
2208 ft.

250 WEST 83RD LLC
250 WEST 83RD STREET
CHICAGO, IL 60620

LUST **S110335774**
ENG CONTROLS **N/A**
INST CONTROL
SRP

Relative:
Lower

Actual:
590 ft.

LUST:
Name: STANDARD BANK & TRUST COMPANY
Address: 250 WEST 83RD STREET
City,State,Zip: CHICAGO, IL 60620
Incident Num: 20100632
IL EPA Id: 316715227
Product: Other Petroleum
IEMA Date: 2010-06-14

250 WEST 83RD LLC (Continued) **S110335774**

PRP Name:	Standard Bank & Trust Company
PRP Contact:	Patricia Ralphson
PRP Address:	7800 West 95th Street
PRP City,St,Zip:	Hickory Hills, IL 60456
PRP Phone:	7084992062
Section 57.5(g) Letter:	734
20 Report Received:	2010-12-17
45 Report Received:	2010-12-17
NFR Date Recorded:	2011-07-28

ENGINEERING CONTROLS:

Illinois Epa Id:	316715227
NFR Letter:	07/14/2011
Date NFR Recorded:	07/28/2011
Comprehensive / Focused:	Focused
Remediation Applicant Name:	Warren Baker
RA Company:	250 West 83rd LLC
RA Address:	2222 North Elston Avenue
RA City,St,Zip:	Chicago, IL 60614
Worker Caution:	Yes
Acres:	1.18
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	No

IL INSTUTIONAL CONTROL:

Illinois EPA Id:	316715227
NFR Letter:	07/14/2011
Date NFR Recorded:	07/28/2011
Comprehensive / Focused:	Focused
Remediation Applicant Name:	Warren Baker
RA Company:	250 West 83rd LLC
RA Address:	2222 North Elston Avenue
RA City,St,Zip:	Chicago, IL 60614
Worker Caution:	Yes
Acres:	1.18
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority Agreement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	Yes
Concrete Used:	Yes

250 WEST 83RD LLC (Continued) **S110335774**

Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	No

SRP:

IL EPA Id:	316715227
Longitude:	-87.631068
Latitude:	41.743832
Contact Name:	Warren Baker
Contact Address:	2222 North Elston Avenue
Contact City,St,Zip:	Chicago, IL 60614
Date Enrolled:	05/05/2010
Point Of Contact:	Jeffrey McClelland, P.E.
Consultant Company:	Pioneer Engineering & Environmental Services, Inc.
Consultant Address:	700 North Sacramento Boulevard
Consultant City,St,Zip:	Chicago, IL 60612
Proj Mgr Assigned:	Todd Hall
Active:	No
Remediation Applicant Co:	250 West 83rd LLC

NFRDL:

Effective:	True
Land Use:	Industrial/Commercial
Ground Water Use Restriction:	No
Highway Authority A greement:	No
Ordinance:	Yes
Industrial - Commercial:	Yes
Slab on Grade:	No
BCT:	No
Building Slab:	No
Asphalt Used:	Yes
Concrete Used:	Yes
Clean Soil 3ft:	No
Clean Soil 10ft:	No
Alternate Barrier:	No
Remediation Applicant Name:	Warren Baker
Remediation Applicant Company:	250 West 83rd LLC
Remediation Applicant Address:	2222 North Elston Avenue
Remediation Applicant City,St,Zip:	Chicago, IL 60614
Illinois EPA:	316715227
Site Name:	250 West 83rd LLC
NFR Letter:	2011-07-14
NFR Letter Date Recorded:	2011-07-28
Comprehensive/Focused:	Focused
Worker Caution:	Y
Acres:	1.18

N51 **CHICAGO, CITY OF** **LUST** **S105225859**
NNW **825 WEST 79TH ST.** **N/A**
1/4-1/2 **CHICAGO, IL 60620**
0.420 mi.
2215 ft. **Site 1 of 2 in cluster N**

Relative: LUST:
Lower

Actual: Name: CHICAGO, CITY OF
596 ft. Address: 825 WEST 79TH ST.
City,State,Zip: CHICAGO, IL 60620
Incident Num: 992468
IL EPA Id: 316715147
Product: Other Petroleum
IEMA Date: 1999-11-01
Project Manager: Hamilton
PRP Name: City of Chicago
PRP Contact: Christ Kozick
PRP Address: 121 North LaSalle
PRP City,St,Zip: Chicago, IL 60602
PRP Phone: 3127447949
Section 57.5(g) Letter: 732
20 Report Received: 1999-11-24
45 Report Received: 2000-01-31
NFA/NFR Letter: **2000-04-28**
NFR Date Recorded: 2000-05-04

Name: CHICAGO, CITY OF
Address: 825 WEST 79TH ST.
City,State,Zip: CHICAGO, IL 60620
Incident Num: 992474
IL EPA Id: 316715147
Product: Other Petroleum
IEMA Date: 1999-11-02
Project Manager: Hamilton
PRP Name: City of Chicago
PRP Contact: Christ Kozicki
PRP Address: 121 North LaSalle
PRP City,St,Zip: Chicago, IL 60602
PRP Phone: 3127447949
Section 57.5(g) Letter: 732
20 Report Received: 1999-11-24
45 Report Received: 2000-01-31
NFA/NFR Letter: **2000-04-28**
NFR Date Recorded: 2000-05-04

N52 **MID AMERICAL INVESTMENT** **LUST** **S104523761**
NNW **838-840 WEST 79TH ST.** **N/A**
1/4-1/2 **CHICAGO, IL 60601**
0.449 mi.
2370 ft. **Site 2 of 2 in cluster N**

Relative: LUST:
Lower

Actual: Name: MID AMERICAL INVESTMENT
596 ft. Address: 838-840 WEST 79TH ST.
City,State,Zip: CHICAGO, IL 60601
Incident Num: 931945
IL EPA Id: 316325184
Product: Fuel Oil
IEMA Date: 1993-07-21
Project Manager: McGill

MID AMERICAL INVESTMENT (Continued) **S104523761**

Project Manager Phone:	(217) 524-5137
Email:	Scott.McGill@illinois.gov
PRP Name:	Mid Americal Investment
PRP Contact:	George Hodges
PRP Address:	155 North Michigan Ave., Suite 500
PRP City,St,Zip:	Chicago, IL 60601
Section 57.5(g) Letter:	731
20 Report Received:	1993-08-20

Count: 0 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
IL	AIRS	Air Inventory Listing	Illinois EPA	08/07/2019	10/02/2019	12/04/2019
IL	ASBESTOS	ASBESTOS	Illinois EPA	09/25/2019	10/02/2019	12/04/2019
IL	AST	Above Ground Storage Tanks	State Fire Marshal	10/03/2019	12/02/2019	01/17/2020
IL	BOL	Bureau of Land Inventory Database	Illinois Environmental Protection Agency	08/20/2019	08/26/2019	10/11/2019
IL	BROWNFIELDS	Redevelopment Assessment Database	Illinois Environmental Protection Agency	10/21/2019	10/22/2019	12/12/2019
IL	BROWNFIELDS	Municipal Brownfields Redevelopment Grant Program Project De	Illinois Environmental Protection Agency	02/11/2010	07/31/2014	09/08/2014
IL	CCDD	Clean Construction or Demolition Debris	Illinois EPA	04/11/2018	05/01/2018	05/30/2018
IL	CDL	Meth Drug Lab Site Listing	Department of Public Health	06/20/2019	10/08/2019	12/05/2019
IL	CHICAGO ENV	Environmental Records Dataset	Chicago Department of Public Health	09/11/2019	09/16/2019	11/19/2019
IL	CHICAGO TANKS	CDPH Storage Tanks Listing	Department of Public Health	09/11/2019	09/16/2019	11/19/2019
IL	COAL ASH	Coal Ash Site Listing	Illinois EPA	10/01/2011	03/09/2012	04/10/2012
IL	DRYCLEANERS	Illinois Licensed Drycleaners	Drycleaner Environmental Response Trust Fund	11/17/2019	11/19/2019	01/09/2020
IL	ENG CONTROLS	Sites with Engineering Controls	Illinois Environmental Protection Agency	09/30/2019	09/30/2019	12/02/2019
IL	Financial Assurance	Financial Assurance Information Listing	Illinois Environmental Protection Agency	12/14/2017	02/22/2018	03/12/2018
IL	HWAR	Hazard Waste Annual Report	Illinois EPA	12/31/2017	02/08/2019	04/04/2019
IL	IEMA SPILLS	Illinois Emergency Management Agency Spills	Illinois Emergency Management Agency	10/28/2019	10/29/2019	12/13/2019
IL	IL NIPC	Solid Waste Landfill Inventory	Northeastern Illinois Planning Commission	08/01/1988	08/01/1994	08/12/1994
IL	IMPDMENT	Surface Impoundment Inventory	Illinois Waste Management & Research Center	12/31/1980	03/08/2002	06/03/2002
IL	Inst Control	Institutional Controls	Illinois Environmental Protection Agency	09/30/2019	09/30/2019	12/02/2019
IL	LF SPECIAL WASTE	Special Waste Site List	Illinois EPA	01/01/1990	06/17/2009	07/15/2009
IL	LF WMRC	Waste Management & Research Center Landfill Database	Department of Natural Resources	12/31/2001	10/06/2006	11/06/2006
IL	LUST	Leaking Underground Storage Tank Sites	Illinois Environmental Protection Agency	10/21/2019	10/22/2019	12/12/2019
IL	LUST TRUST	Underground Storage Tank Fund Payment Priority List	Illinois EPA	06/06/2016	07/27/2016	10/18/2016
IL	NPDES	A Listing of Active Permits	Illinois EPA	04/16/2014	04/18/2014	05/20/2014
IL	PIMW	Potentially Infectious Medical Waste	Illinois EPA	09/16/2019	09/18/2019	11/19/2019
IL	RGA HWS	Recovered Government Archive State Hazardous Waste Facilitie	Department of Natural Resources		07/01/2013	12/30/2013
IL	RGA LF	Recovered Government Archive Solid Waste Facilities List	Illinois Environmental Protection Agency		07/01/2013	01/10/2014
IL	RGA LUST	Recovered Government Archive Leaking Underground Storage Tan	Illinois Environmental Protection Agency		07/01/2013	12/30/2013
IL	SPILLS	State spills	Illinois EPA	08/22/2019	10/04/2019	12/04/2019
IL	SPILLS 90	SPILLS90 data from FirstSearch	FirstSearch	07/18/2012	01/03/2013	03/15/2013
IL	SRP	Site Remediation Program Database	Illinois Environmental Protection Agency	09/30/2019	09/30/2019	12/02/2019
IL	SSU	State Sites Unit Listing	Illinois Environmental Protection Agency	11/07/2019	11/08/2019	01/15/2020
IL	SWF/LF	Available Disposal for Solid Waste in Illinois - Solid Waste	Illinois Environmental Protection Agency	12/31/2018	10/29/2019	12/13/2019
IL	TIER 2	Tier 2 Information Listing	Illinois Emergency Management Agency	12/31/2018	05/14/2019	05/24/2019
IL	UIC	Underground Injection Wells	Illinois EPA	06/25/2018	09/04/2018	09/11/2018
IL	UST	Underground Storage Tank Facility List	Illinois State Fire Marshal	10/21/2019	10/22/2019	12/12/2019
US	2020 COR ACTION	2020 Corrective Action Program List	Environmental Protection Agency	09/30/2017	05/08/2018	07/20/2018
US	ABANDONED MINES	Abandoned Mines	Department of Interior	09/10/2019	09/10/2019	10/17/2019
US	BRS	Biennial Reporting System	EPA/NTIS	12/31/2015	02/22/2017	09/28/2017
US	COAL ASH DOE	Steam-Electric Plant Operation Data	Department of Energy	12/31/2018	12/04/2019	01/15/2020
US	COAL ASH EPA	Coal Combustion Residues Surface Impoundments List	Environmental Protection Agency	01/12/2017	03/05/2019	11/11/2019
US	CONSENT	Superfund (CERCLA) Consent Decrees	Department of Justice, Consent Decree Library	09/30/2019	10/09/2019	12/20/2019
US	CORRACTS	Corrective Action Report	EPA	12/16/2019	12/16/2019	12/20/2019
US	DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations	EPA, Region 9	01/12/2009	05/07/2009	09/21/2009
US	DOCKET HWC	Hazardous Waste Compliance Docket Listing	Environmental Protection Agency	05/31/2018	07/26/2018	10/05/2018
US	DOD	Department of Defense Sites	USGS	12/31/2005	11/10/2006	01/11/2007
US	DOT OPS	Incident and Accident Data	Department of Transporation, Office of Pipeli	10/01/2019	10/29/2019	01/15/2020

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
US	Delisted NPL	National Priority List Deletions	EPA	01/30/2020	02/05/2020	02/14/2020
US	ECHO	Enforcement & Compliance History Information	Environmental Protection Agency	10/06/2019	10/08/2019	01/02/2020
US	EDR Hist Auto	EDR Exclusive Historical Auto Stations	EDR, Inc.			
US	EDR Hist Cleaner	EDR Exclusive Historical Cleaners	EDR, Inc.			
US	EDR MGP	EDR Proprietary Manufactured Gas Plants	EDR, Inc.			
US	EPA WATCH LIST	EPA WATCH LIST	Environmental Protection Agency	08/30/2013	03/21/2014	06/17/2014
US	ERNS	Emergency Response Notification System	National Response Center, United States Coast	09/09/2019	09/09/2019	09/23/2019
US	FEDERAL FACILITY	Federal Facility Site Information listing	Environmental Protection Agency	04/03/2019	04/05/2019	05/14/2019
US	FEDLAND	Federal and Indian Lands	U.S. Geological Survey	04/02/2018	04/11/2018	11/06/2019
US	FEMA UST	Underground Storage Tank Listing	FEMA	08/27/2019	08/28/2019	11/11/2019
US	FINDS	Facility Index System/Facility Registry System	EPA	08/12/2019	09/04/2019	12/03/2019
US	FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu	EPA/Office of Prevention, Pesticides and Toxi	04/09/2009	04/16/2009	05/11/2009
US	FTTS INSP	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu	EPA	04/09/2009	04/16/2009	05/11/2009
US	FUDS	Formerly Used Defense Sites	U.S. Army Corps of Engineers	11/12/2019	11/19/2019	01/28/2020
US	FUELS PROGRAM	EPA Fuels Program Registered Listing	EPA	11/18/2019	11/19/2019	01/28/2020
US	FUSRAP	Formerly Utilized Sites Remedial Action Program	Department of Energy	08/08/2017	09/11/2018	09/14/2018
US	HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing	Environmental Protection Agency	10/19/2006	03/01/2007	04/10/2007
US	HIST FTTS INSP	FIFRA/TSCA Tracking System Inspection & Enforcement Case Lis	Environmental Protection Agency	10/19/2006	03/01/2007	04/10/2007
US	HMIRS	Hazardous Materials Information Reporting System	U.S. Department of Transportation	12/05/2019	12/06/2019	02/14/2020
US	ICIS	Integrated Compliance Information System	Environmental Protection Agency	11/18/2016	11/23/2016	02/10/2017
US	IHS OPEN DUMPS	Open Dumps on Indian Land	Department of Health & Human Serivces, Indian	04/01/2014	08/06/2014	01/29/2015
US	INDIAN LUST R1	Leaking Underground Storage Tanks on Indian Land	EPA Region 1	10/01/2019	12/04/2019	02/10/2020
US	INDIAN LUST R10	Leaking Underground Storage Tanks on Indian Land	EPA Region 10	10/11/2019	12/04/2019	02/10/2020
US	INDIAN LUST R4	Leaking Underground Storage Tanks on Indian Land	EPA Region 4	10/10/2019	12/05/2019	02/10/2020
US	INDIAN LUST R5	Leaking Underground Storage Tanks on Indian Land	EPA, Region 5	10/01/2019	12/04/2019	02/10/2020
US	INDIAN LUST R6	Leaking Underground Storage Tanks on Indian Land	EPA Region 6	10/02/2019	12/04/2019	02/10/2020
US	INDIAN LUST R7	Leaking Underground Storage Tanks on Indian Land	EPA Region 7	10/15/2019	12/17/2019	02/10/2020
US	INDIAN LUST R8	Leaking Underground Storage Tanks on Indian Land	EPA Region 8	10/03/2019	12/04/2019	02/14/2020
US	INDIAN LUST R9	Leaking Underground Storage Tanks on Indian Land	Environmental Protection Agency	04/08/2019	07/29/2019	10/17/2019
US	INDIAN ODI	Report on the Status of Open Dumps on Indian Lands	Environmental Protection Agency	12/31/1998	12/03/2007	01/24/2008
US	INDIAN RESERV	Indian Reservations	USGS	12/31/2014	07/14/2015	01/10/2017
US	INDIAN UST R1	Underground Storage Tanks on Indian Land	EPA, Region 1	10/01/2019	12/04/2019	02/10/2020
US	INDIAN UST R10	Underground Storage Tanks on Indian Land	EPA Region 10	10/11/2019	12/04/2019	02/10/2020
US	INDIAN UST R4	Underground Storage Tanks on Indian Land	EPA Region 4	10/10/2019	12/05/2019	02/10/2020
US	INDIAN UST R5	Underground Storage Tanks on Indian Land	EPA Region 5	10/01/2019	12/04/2019	02/10/2020
US	INDIAN UST R6	Underground Storage Tanks on Indian Land	EPA Region 6	10/02/2019	12/04/2019	02/10/2020
US	INDIAN UST R7	Underground Storage Tanks on Indian Land	EPA Region 7	10/11/2019	12/04/2019	02/10/2020
US	INDIAN UST R8	Underground Storage Tanks on Indian Land	EPA Region 8	10/03/2019	12/04/2019	02/14/2020
US	INDIAN UST R9	Underground Storage Tanks on Indian Land	EPA Region 9	04/08/2019	07/29/2019	10/17/2019
US	INDIAN VCP R1	Voluntary Cleanup Priority Listing	EPA, Region 1	07/27/2015	09/29/2015	02/18/2016
US	INDIAN VCP R7	Voluntary Cleanup Priority Lisitng	EPA, Region 7	03/20/2008	04/22/2008	05/19/2008
US	LEAD SMELTER 1	Lead Smelter Sites	Environmental Protection Agency	01/30/2020	02/05/2020	02/14/2020
US	LEAD SMELTER 2	Lead Smelter Sites	American Journal of Public Health	04/05/2001	10/27/2010	12/02/2010
US	LIENS 2	CERCLA Lien Information	Environmental Protection Agency	01/30/2020	02/05/2020	02/14/2020
US	LUCIS	Land Use Control Information System	Department of the Navy	11/04/2019	11/13/2019	01/28/2020
US	MINES MRDS	Mineral Resources Data System	USGS	04/06/2018	10/21/2019	10/24/2019
US	MINES VIOLATIONS	MSHA Violation Assessment Data	DOL, Mine Safety & Health Admi	12/03/2019	12/03/2019	01/28/2020

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
US	MLTS	Material Licensing Tracking System	Nuclear Regulatory Commission	10/25/2019	10/25/2019	01/15/2020
US	NPL	National Priority List	EPA	01/30/2020	02/05/2020	02/14/2020
US	NPL LIENS	Federal Superfund Liens	EPA	10/15/1991	02/02/1994	03/30/1994
US	ODI	Open Dump Inventory	Environmental Protection Agency	06/30/1985	08/09/2004	09/17/2004
US	PADS	PCB Activity Database System	EPA	10/09/2019	10/11/2019	12/20/2019
US	PCB TRANSFORMER	PCB Transformer Registration Database	Environmental Protection Agency	09/13/2019	11/06/2019	02/10/2020
US	PRP	Potentially Responsible Parties	EPA	01/30/2020	02/06/2020	02/14/2020
US	Proposed NPL	Proposed National Priority List Sites	EPA	01/30/2020	02/05/2020	02/14/2020
US	RAATS	RCRA Administrative Action Tracking System	EPA	04/17/1995	07/03/1995	08/07/1995
US	RADINFO	Radiation Information Database	Environmental Protection Agency	07/01/2019	07/01/2019	09/23/2019
US	RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated	Environmental Protection Agency	12/16/2019	12/16/2019	12/20/2019
US	RCRA-LQG	RCRA - Large Quantity Generators	Environmental Protection Agency	12/16/2019	12/16/2019	12/20/2019
US	RCRA-SQG	RCRA - Small Quantity Generators	Environmental Protection Agency	12/16/2019	12/16/2019	12/20/2019
US	RCRA-TSDF	RCRA - Treatment, Storage and Disposal	Environmental Protection Agency	12/16/2019	12/16/2019	12/20/2019
US	RCRA-VSQG	RCRA - Very Small Quantity Generators (Formerly Conditionall	Environmental Protection Agency	12/16/2019	12/16/2019	12/20/2019
US	RMP	Risk Management Plans	Environmental Protection Agency	04/25/2019	05/02/2019	05/23/2019
US	ROD	Records Of Decision	EPA	01/30/2020	02/05/2020	02/14/2020
US	SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing	Environmental Protection Agency	01/01/2017	02/03/2017	04/07/2017
US	SEMS	Superfund Enterprise Management System	EPA	01/30/2020	02/05/2020	02/14/2020
US	SEMS-ARCHIVE	Superfund Enterprise Management System Archive	EPA	01/30/2020	02/05/2020	02/14/2020
US	SSTS	Section 7 Tracking Systems	EPA	05/01/2019	10/23/2019	01/15/2020
US	TRIS	Toxic Chemical Release Inventory System	EPA	12/31/2017	11/16/2018	11/21/2019
US	TSCA	Toxic Substances Control Act	EPA	12/31/2016	06/21/2017	01/05/2018
US	UMTRA	Uranium Mill Tailings Sites	Department of Energy	08/30/2019	11/15/2019	01/28/2020
US	US AIRS (AFS)	Aerometric Information Retrieval System Facility Subsystem (	EPA	10/12/2016	10/26/2016	02/03/2017
US	US AIRS MINOR	Air Facility System Data	EPA	10/12/2016	10/26/2016	02/03/2017
US	US BROWNFIELDS	A Listing of Brownfields Sites	Environmental Protection Agency	06/03/2019	06/04/2019	08/26/2019
US	US CDL	Clandestine Drug Labs	Drug Enforcement Administration	06/11/2019	06/13/2019	09/03/2019
US	US ENG CONTROLS	Engineering Controls Sites List	Environmental Protection Agency	11/22/2019	11/22/2019	01/28/2020
US	US FIN ASSUR	Financial Assurance Information	Environmental Protection Agency	09/23/2019	09/24/2019	12/20/2019
US	US HIST CDL	National Clandestine Laboratory Register	Drug Enforcement Administration	06/11/2019	06/13/2019	09/03/2019
US	US INST CONTROL	Sites with Institutional Controls	Environmental Protection Agency	11/22/2019	11/22/2019	01/28/2020
US	US MINES	Mines Master Index File	Department of Labor, Mine Safety and Health A	11/06/2019	11/25/2019	01/28/2020
US	US MINES 2	Ferrous and Nonferrous Metal Mines Database Listing	USGS	12/05/2005	02/29/2008	04/18/2008
US	US MINES 3	Active Mines & Mineral Plants Database Listing	USGS	04/14/2011	06/08/2011	09/13/2011
US	UXO	Unexploded Ordnance Sites	Department of Defense	12/31/2017	01/17/2019	04/01/2019

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
CT	CT MANIFEST	Hazardous Waste Manifest Data	Department of Energy & Environmental Protecti	05/14/2019	12/05/2019	02/03/2020
NJ	NJ MANIFEST	Manifest Information	Department of Environmental Protection	12/31/2018	04/10/2019	05/16/2019
NY	NY MANIFEST	Facility and Manifest Data	Department of Environmental Conservation	01/01/2019	05/01/2019	06/21/2019
PA	PA MANIFEST	Manifest Information	Department of Environmental Protection	06/30/2018	07/19/2019	09/10/2019
RI	RI MANIFEST	Manifest information	Department of Environmental Management	12/31/2018	10/02/2019	12/10/2019
WI	WI MANIFEST	Manifest Information	Department of Natural Resources	05/31/2018	06/19/2019	09/03/2019
US	AHA Hospitals	Sensitive Receptor: AHA Hospitals	American Hospital Association, Inc.			
US	Medical Centers	Sensitive Receptor: Medical Centers	Centers for Medicare & Medicaid Services			
US	Nursing Homes	Sensitive Receptor: Nursing Homes	National Institutes of Health			
US	Public Schools	Sensitive Receptor: Public Schools	National Center for Education Statistics			
US	Private Schools	Sensitive Receptor: Private Schools	National Center for Education Statistics			
IL	Daycare Centers	Sensitive Receptor: Homes & Centers Listing	Department of Children & Family Services			
US	Flood Zones	100-year and 500-year flood zones	Emergency Management Agency (FEMA)			
US	NWI	National Wetlands Inventory	U.S. Fish and Wildlife Service			
IL	State Wetlands	Wetland Inventory	Illinois State Geological Survey			
US	Topographic Map	Current USGS 7.5 Minute Topographic Map	U.S. Geological Survey			
US	Oil/Gas Pipelines		Endeavor Business Media			
US	Electric Power Transmission Line Data		Endeavor Business Media			

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

650 WEST 83RD STREET PHASE I ESA
650 WEST 83RD STREET
CHICAGO, IL 60620

TARGET PROPERTY COORDINATES

Latitude (North):	41.744363 - 41° 44' 39.71''
Longitude (West):	87.640421 - 87° 38' 25.52''
Universal Tranverse Mercator:	Zone 16
UTM X (Meters):	446748.5
UTM Y (Meters):	4621379.0
Elevation:	602 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5680671 BLUE ISLAND, IL
Version Date:	2012
Northeast Map:	5681450 JACKSON PARK, IL
Version Date:	2012
Southeast Map:	5681452 LAKE CALUMET, IL
Version Date:	2012
Northwest Map:	5681448 ENGLEWOOD, IL
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

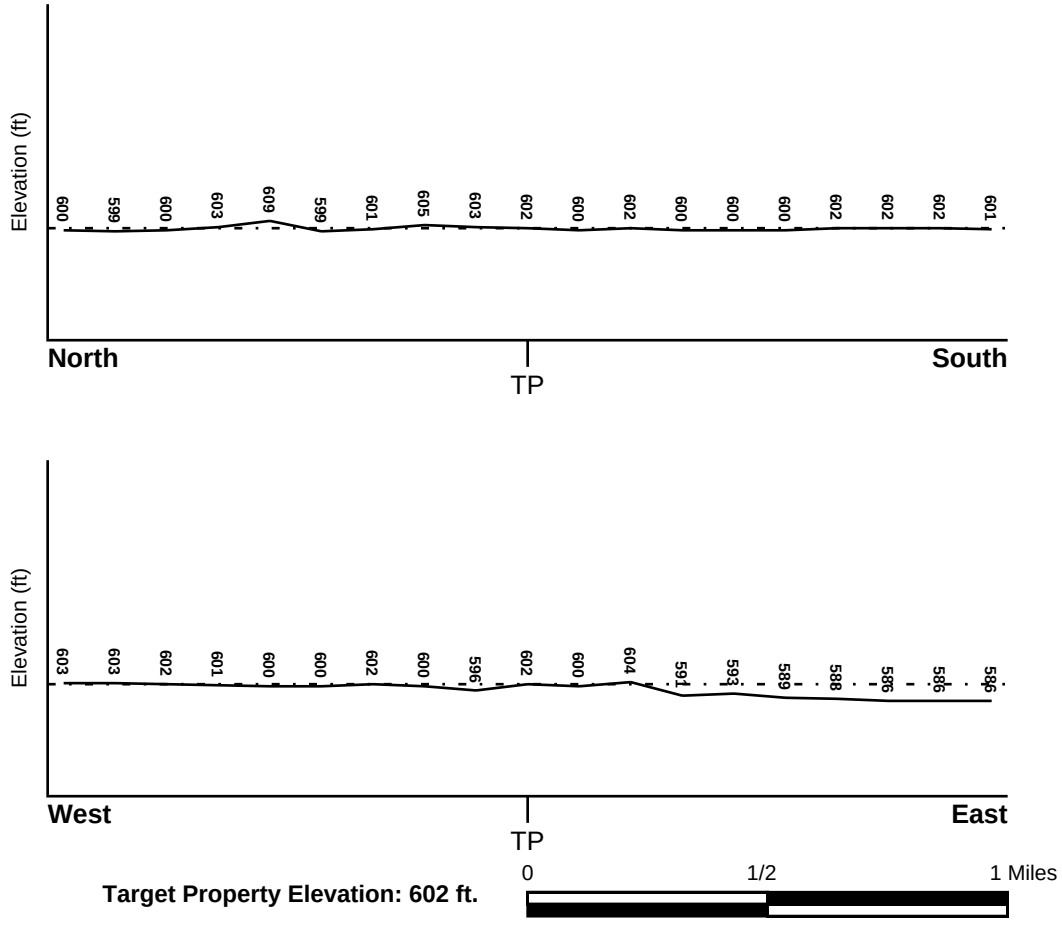
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General South

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
1700740105B	FEMA Q3 Flood data

Additional Panels in search area:	FEMA Source Type
17031C0540J	FEMA FIRM Flood data
1700740100B	FEMA Q3 Flood data
17031C0655J	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
BLUE ISLAND	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
10	1/2 - 1 Mile ESE	S
C12	1/2 - 1 Mile ENE	SSE, S
13	1/2 - 1 Mile East	Not Reported
C14	1/2 - 1 Mile ENE	NE
19	1/2 - 1 Mile NNE	Not Reported
1G	1/2 - 1 Mile NNE	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
2G	1/2 - 1 Mile ENE	NE
3G	1/2 - 1 Mile ENE	SSE, S
4G	1/2 - 1 Mile East	Not Reported
5G	1/2 - 1 Mile ESE	S

For additional site information, refer to Physical Setting Source Map Findings.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Paleozoic
System:	Silurian
Series:	Middle Silurian (Niagoaran)
Code:	S2 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name: URBANLAND

Soil Surface Texture: variable

Hydrologic Group: Not reported

Soil Drainage Class: Not reported

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Bedrock Max: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	60 inches	variable	Not reported	Not reported	Max: 0.00 Min: 0.00	Max: 0.00 Min: 0.00

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: silt loam
fine sandy loam
loam
fine sand

Surficial Soil Types: silt loam
fine sandy loam
loam
fine sand

Shallow Soil Types: sandy loam

Deeper Soil Types: silt loam
sand
loamy sand
loam

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

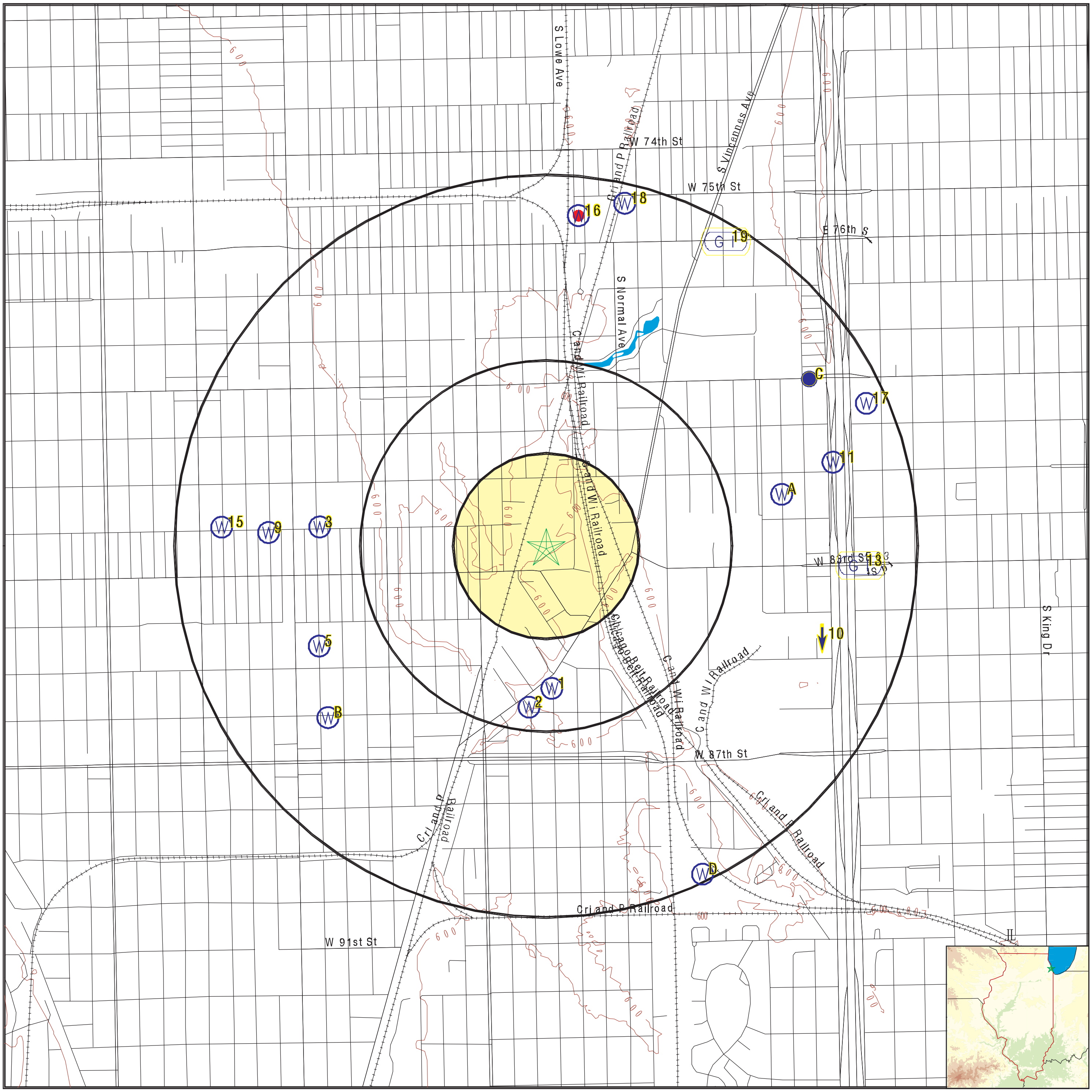
MAP ID	WELL ID	LOCATION FROM TP
1	ILSG30000038824	1/4 - 1/2 Mile South
2	ILPW6702	1/4 - 1/2 Mile South
3	ILSG30000048114	1/2 - 1 Mile West
A4	ILSG30000039268	1/2 - 1 Mile ENE
5	ILSG30000038228	1/2 - 1 Mile WSW
A6	ILPW6701	1/2 - 1 Mile ENE
B7	ILPW6699	1/2 - 1 Mile SW
B8	ILPW6700	1/2 - 1 Mile SW
9	ILSG30000048115	1/2 - 1 Mile West
11	ILPW6704	1/2 - 1 Mile ENE
15	ILSG30000048116	1/2 - 1 Mile West
16	ILSG30000045744	1/2 - 1 Mile North
17	ILSG30000036593	1/2 - 1 Mile ENE
18	ILPW6684	1/2 - 1 Mile NNE
D20	ILSG30000033492	1/2 - 1 Mile SSE
D21	ILPW5488	1/2 - 1 Mile SSE
D22	ILPW5489	1/2 - 1 Mile SSE

OTHER STATE DATABASE INFORMATION

STATE OIL/GAS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	ILOG10000457438	1/2 - 1 Mile North

PHYSICAL SETTING SOURCE MAP - 5986820.2s



County Boundary	Groundwater Flow Direction
Major Roads	Indeterminate Groundwater Flow at Location
Contour Lines	Groundwater Flow Varies at Location
Earthquake epicenter, Richter 5 or greater	Closest Hydrogeological Data
Water Wells	Oil, gas or related wells
Public Water Supply Wells	
Cluster of Multiple Icons	

0 1/4 1/2 1 Miles

SITE NAME: 650 West 83rd Street Phase I ESA	CLIENT: Terracon
ADDRESS: 650 West 83rd Street	CONTACT: Chris Heynen
Chicago IL 60620	INQUIRY #: 5986820.2s
LAT/LONG: 41.744363 / 87.640421	DATE: February 26, 2020 2:38 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
South
1/4 - 1/2 Mile
Lower

IL WELLS **ILSG30000038824**

Database:	Water Well Records	API #:	120312627300
IL State Water Survey P #:	24263	Status:	Engineering Test
Well Name:	Chicago Bureau Engineering		
Well:	19-2	Driller:	Not Reported
Date Drilled:	1967 8 1	Elevation:	0
Elevation Reference:	Not Reported	Total Depth:	50
Lithologic Formation:	Not Reported	Top of Formation (ft):	0
Bottom of Formation (ft):	0	Pump Flow (gal/min):	0

2
South
1/4 - 1/2 Mile
Lower

IL WELLS **ILPW6702**

Database:	Illinois Private Well Database and PICS		
Well ID:	6702	2nd ID:	26273
Owner:	CHICAGO DEPT OF ENGINEERING(TH	Driller:	Not Reported
Date drilled:	08/00/1967	Permit:	Not Reported
Depth:	51	Record type:	RGX
Well Use:	IN	Well Type:	Not Reported
Aquifer type:	Not Reported		

3
West
1/2 - 1 Mile
Higher

IL WELLS **ILSG30000048114**

Database:	Water Well Records	API #:	120313680300
IL State Water Survey P #:	0	Status:	Engineering Test
Well Name:	Group 4 ? Auxiliary Outlet Sewers		
Well:	4-C42	Driller:	Raymond Concrete Pile Co.
Date Drilled:	1954 916	Elevation:	0
Elevation Reference:	Not Reported	Total Depth:	19
Lithologic Formation:	Not Reported	Top of Formation (ft):	0
Bottom of Formation (ft):	0	Pump Flow (gal/min):	0

A4
ENE
1/2 - 1 Mile
Lower

IL WELLS **ILSG30000039268**

Database:	Water Well Records	API #:	120312671800
IL State Water Survey P #:	24172	Status:	Engineering Test
Well Name:	Hookway School	Well:	B-4
Driller:	Not Reported	Date Drilled:	1927 8 1
Elevation:	586	Elevation Reference:	Ground level
Total Depth:	18	Lithologic Formation:	Not Reported
Top of Formation (ft):	0	Bottom of Formation (ft):	0
Pump Flow (gal/min):	0		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

5
WSW
1/2 - 1 Mile
Higher

IL WELLS **ILSG30000038228**

Database:	Water Well Records	API #:	120312566500
IL State Water Survey P #:	0	Status:	Engineering Test
Well Name:	Central S. S. Sewer Contr. 2E		
Well:	C-1-3	Driller:	Chicago Pub. Works Dept.
Date Drilled:	197112 1	Elevation:	603
Elevation Reference:	Ground level	Total Depth:	53
Lithologic Formation:	Not Reported	Top of Formation (ft):	0
Bottom of Formation (ft):	0	Pump Flow (gal/min):	0

A6
ENE
1/2 - 1 Mile
Lower

IL WELLS **ILPW6701**

Database:	Illinois Private Well Database and PICS		
Well ID:	6701	2nd ID:	26718
Owner:	HOOKWAY SCHOOL	Driller:	Not Reported
Date drilled:	08/00/1927	Permit:	Not Reported
Depth:	18	Record type:	RG
Well Use:	School	Well Type:	Not Reported
Aquifer type:	Not Reported		

B7
SW
1/2 - 1 Mile
Higher

IL WELLS **ILPW6699**

Database:	Illinois Private Well Database and PICS		
Well ID:	6699	2nd ID:	25665
Owner:	CHICAGO DPT OF PUBLIC WORKS(TH	Driller:	Not Reported
Date drilled:	12/00/1971	Permit:	Not Reported
Depth:	53	Record type:	RGX
Well Use:	IN	Well Type:	Not Reported
Aquifer type:	Not Reported		

B8
SW
1/2 - 1 Mile
Higher

IL WELLS **ILPW6700**

Database:	Illinois Private Well Database and PICS		
Well ID:	6700	2nd ID:	25665
Owner:	CHICAGO DEPT OF PUBLIC WORKS (	Driller:	Not Reported
Date drilled:	12/00/1971	Permit:	Not Reported
Depth:	53	Record type:	RGX
Well Use:	IN	Well Type:	||
Aquifer type:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
9 **West** **1/2 - 1 Mile** **Higher**	**IL WELLS**	**ILSG30000048115**

Database:	Water Well Records	API #:	120313680400
IL State Water Survey P #:	0	Status:	Engineering Test
Well Name:	Group 4, Auxiliary Outlet Sewers		
Well:	4-C43	Driller:	Raymond Concrete Pile Co.
Date Drilled:	1954 917	Elevation:	0
Elevation Reference:	Not Reported	Total Depth:	17
Lithologic Formation:	Not Reported	Top of Formation (ft):	0
Bottom of Formation (ft):	0	Pump Flow (gal/min):	0

---

10 **ESE** **1/2 - 1 Mile** **Lower**	Site ID:	1000825160		**AQUIFLOW**	**56344**
	Groundwater Flow:	S			
	Deep Water Depth:	Not Reported			
	Average Water Depth:	Not Reported			
	Shallow Water Depth:	Not Reported			
	Current Deep Depth:	Not Reported			
	Current Average Depth:	Not Reported			
	Current Shallow Depth:	Not Reported			
	Date:	06/1993			

---

11 **ENE** **1/2 - 1 Mile** **Lower**				**IL WELLS**	**ILPW6704**
Database:	Illinois Private Well Database and PICS				
Well ID:	6704	2nd ID:	Not Reported		
Owner:	CHICAGO PUBLIC WORKS DEPT (TH)	Driller:	Not Reported		
Date drilled:	00/00/1910	Permit:	Not Reported		
Depth:	114	Record type:	RGX		
Well Use:	IN	Well Type:	Not Reported		
Aquifer type:	Not Reported				

C12 **ENE** **1/2 - 1 Mile** **Lower**	Site ID:	S100530157		**AQUIFLOW**	**62811**
	Groundwater Flow:	SSE, S			
	Deep Water Depth:	9.00			
	Average Water Depth:	Not Reported			
	Shallow Water Depth:	4.09			
	Current Deep Depth:	5.04			
	Current Average Depth:	Not Reported			
	Current Shallow Depth:	3.91			
	Date:	02/28/1996			

---

13 **East** **1/2 - 1 Mile** **Lower**	Site ID:	S100530167		**AQUIFLOW**	**56638**
	Groundwater Flow:	Not Reported			
	Deep Water Depth:	5			
	Average Water Depth:	Not Reported			
	Shallow Water Depth:	5			
	Current Deep Depth:	4.5			
	Current Average Depth:	Not Reported			
	Current Shallow Depth:	3			
	Date:	06/30/1997			

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

C14
ENE
1/2 - 1 Mile
Lower

AQUIFLOW **24917**

Site ID:	S100530714
Groundwater Flow:	NE
Deep Water Depth:	8
Average Water Depth:	Not Reported
Shallow Water Depth:	5
Current Deep Depth:	8
Current Average Depth:	Not Reported
Current Shallow Depth:	5
Date:	11/1/1995

15
West
1/2 - 1 Mile
Higher

IL WELLS **ILSG30000048116**

Database:	Water Well Records	API #:	120313680500
IL State Water Survey P #:	0	Status:	Engineering Test
Well Name:	Group 4, Auxiliary Outlet Sewers		
Well:	4-C44	Driller:	Raymond Concrete Pile Co.
Date Drilled:	1954 917	Elevation:	0
Elevation Reference:	Not Reported	Total Depth:	17
Lithologic Formation:	Not Reported	Top of Formation (ft):	0
Bottom of Formation (ft):	0	Pump Flow (gal/min):	0

16
North
1/2 - 1 Mile
Lower

IL WELLS **ILSG30000045744**

Database:	Water Well Records	API #:	120313433500
IL State Water Survey P #:	0	Status:	Stratigraphic Test
Well Name:	Hamilton Park	Well:	Not Reported
Driller:	Illinois State Geological Survey		
Date Drilled:	0	Elevation:	0
Elevation Reference:	Ground level	Total Depth:	20
Lithologic Formation:	Not Reported	Top of Formation (ft):	0
Bottom of Formation (ft):	0	Pump Flow (gal/min):	0

17
ENE
1/2 - 1 Mile
Lower

IL WELLS **ILSG30000036593**

Database:	Water Well Records	API #:	120310402200
IL State Water Survey P #:	0	Status:	Engineering Test
Well Name:	Not Reported	Well:	Not Reported
Driller:	Chicago Pub. Works Dept.	Date Drilled:	1910 1 1
Elevation:	589	Elevation Reference:	Ground level
Total Depth:	114	Lithologic Formation:	Not Reported
Top of Formation (ft):	0	Bottom of Formation (ft):	0
Pump Flow (gal/min):	0		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

18
NNE
1/2 - 1 Mile
Lower

IL WELLS **ILPW6684**

Database:	Illinois Private Well Database and PICS		
Well ID:	6684	2nd ID:	Not Reported
Owner:	A L RANDALL CO	Driller:	Not Reported
Date drilled:	00/00/1922	Permit:	Not Reported
Depth:	Not Reported	Record type:	O
Well Use:	IN	Well Type:	Not Reported
Aquifer type:	Not Reported		

19
NNE
1/2 - 1 Mile
Lower

AQUIFLOW **62271**

Site ID:	S100530476
Groundwater Flow:	Not Reported
Deep Water Depth:	Not Reported
Average Water Depth:	Not Reported
Shallow Water Depth:	11
Current Deep Depth:	Not Reported
Current Average Depth:	Not Reported
Current Shallow Depth:	11
Date:	05/27/1993

D20
SSE
1/2 - 1 Mile
Higher

IL WELLS **ILSG30000033492**

Database:	Water Well Records	API #:	120310079600
IL State Water Survey P #:	0	Status:	Engineering Test
Well Name:	MSD Chicago-Deep Tunnel Sys		
Well:	SW-5	Driller:	Chicago Sanitary Dist.
Date Drilled:	1968 1 1	Elevation:	599
Elevation Reference:	Ground level	Total Depth:	900
Lithologic Formation:	Not Reported	Top of Formation (ft):	0
Bottom of Formation (ft):	0	Pump Flow (gal/min):	0

D21
SSE
1/2 - 1 Mile
Higher

IL WELLS **ILPW5488**

Database:	Illinois Private Well Database and PICS		
Well ID:	5488	2nd ID:	Not Reported
Owner:	CHICAGO & WESTERN INDIANA RR	Driller:	LAYNE-WESTERN
Date drilled:	01/27/1968	Permit:	X004152
Depth:	898	Record type:	RG
Well Use:	IN	Well Type:	Not Reported
Aquifer type:	Bedrock		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation			Database	EDR ID Number
D22 **SSE** **1/2 - 1 Mile** **Higher**			**IL WELLS**	**ILPW5489**

Database:	Illinois Private Well Database and PICS		
Well ID:	5489	2nd ID:	Not Reported
Owner:	METROPOLITAN SANITARY DIST	Driller:	LAYNE-WESTERN
Date drilled:	01/00/1968	Permit:	Not Reported
Depth:	489	Record type:	CI
Well Use:	IN	Well Type:	||
Aquifer type:	Bedrock		

1G **NNE** **1/2 - 1 Mile** **Lower**	Site ID:	S100530476	**AQUIFLOW**	**62271**
	Groundwater Flow:	Not Reported		
	Deep Water Depth:	Not Reported		
	Average Water Depth:	Not Reported		
	Shallow Water Depth:	11		
	Current Deep Depth:	Not Reported		
	Current Average Depth:	Not Reported		
	Current Shallow Depth:	11		
	Date:	05/27/1993		

2G **ENE** **1/2 - 1 Mile** **Lower**	Site ID:	S100530714	**AQUIFLOW**	**24917**
	Groundwater Flow:	NE		
	Deep Water Depth:	8		
	Average Water Depth:	Not Reported		
	Shallow Water Depth:	5		
	Current Deep Depth:	8		
	Current Average Depth:	Not Reported		
	Current Shallow Depth:	5		
	Date:	11/1/1995		

3G **ENE** **1/2 - 1 Mile** **Lower**	Site ID:	S100530157	**AQUIFLOW**	**62811**
	Groundwater Flow:	SSE, S		
	Deep Water Depth:	9.00		
	Average Water Depth:	Not Reported		
	Shallow Water Depth:	4.09		
	Current Deep Depth:	5.04		
	Current Average Depth:	Not Reported		
	Current Shallow Depth:	3.91		
	Date:	02/28/1996		

4G **East** **1/2 - 1 Mile** **Lower**	Site ID:	S100530167	**AQUIFLOW**	**56638**
	Groundwater Flow:	Not Reported		
	Deep Water Depth:	5		
	Average Water Depth:	Not Reported		
	Shallow Water Depth:	5		
	Current Deep Depth:	4.5		
	Current Average Depth:	Not Reported		
	Current Shallow Depth:	3		
	Date:	06/30/1997		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

5G
ESE
1/2 - 1 Mile
Lower

AQUIFLOW **56344**

Site ID:	1000825160
Groundwater Flow:	S
Deep Water Depth:	Not Reported
Average Water Depth:	Not Reported
Shallow Water Depth:	Not Reported
Current Deep Depth:	Not Reported
Current Average Depth:	Not Reported
Current Shallow Depth:	Not Reported
Date:	06/1993

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance

Database EDR ID Number

1
North
1/2 - 1 Mile

OIL_GAS **ILOG10000457438**

API #:	120313433500	Date Completed:	Not Reported
Status:	Stratigraphic Test		
Permit #:	0	Permit Date:	null
Status:	Stratigraphic Test	Max Depth:	20
Formation:	Not Reported	Company Name:	Illinois State Geological Survey
Well Name:	Hamilton Park	Well #:	0
Elevation:	0	Logs:	null
Completion Date:	null	Elevation Reference:	Ground Level

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: IL Radon

Radon Test Results

Zipcode	Result
60620	1

Federal EPA Radon Zone for COOK County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for COOK COUNTY, IL

Number of sites tested: 82

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	1.273 pCi/L	96%	4%	0%
Living Area - 2nd Floor	0.900 pCi/L	100%	0%	0%
Basement	1.740 pCi/L	93%	7%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Illinois State Geological Survey
Telephone: 217-333-4747

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

OTHER STATE DATABASE INFORMATION

Oil and Gas Wells Listing
Source: Illinois State Geological Survey
Telephone: 217-333-5109
Oil and gas wells location points from the Illinois State Geological Survey database.

Water Well Records
Source: Illinois Geological Survey
Telephone: 217-333-4747

Illinois Private Well Database and PICS (Public, Industrial, Commercial Survey)
Source: Illinois State Water Survey
Telephone: 217-333-9043

Water Well Location Information
Source: Illinois Environmental Protection Agency
Telephone: 217-782-0810

RADON

State Database: IL Radon
Source: Department of Nuclear Safety
Telephone: 217-785-9958
County Radon Results

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

STREET AND ADDRESS INFORMATION

APPENDIX E

Photographs

Photo 1: View of the site facing north.

Photo 2: View of the site facing northeast.

Photo 3: View of the site facing east.

Photo 4: View of the crushed concrete and stone located on the northwest portion of the site.

Photo 5: View of the site facing southeast.

Photo 6: View of the site facing south.

Photo 7: View of the site facing southwest.

Photo 8: View of the mulch located on the southeast portion of the site.

Photo 9: View of the site facing west.

Photo 10: View of the site facing northwest.

Photo 11: View of the dirt, gravel, concrete, shredded plastic, and dumpsters located on the northeast portion of the site.

Photo 12: View of the north adjoining property facing northwest.

Photo 13: View of east adjoining property facing northeast.

Photo 14: View of east adjoining property facing southeast.

Photo 15: View of south adjoining property facing southeast.

Photo 16: View of south adjoining property facing south.

Photo 17: View of south adjoining property facing southwest.

Photo 18: View of west adjoining property facing west.

APPENDIX F

Consultant Qualifications

Rachelle K. Christian, P.G.

ENVIRONMENTAL DEPARTMENT MANAGER, ENVIRONMENTAL PROFESSIONAL

PROFESSIONAL EXPERIENCE

Mrs. Christian is an environmental geologist in Terracon's Lubbock, Texas office. She has 24 years of experience in environmental consulting, and she has experience in performing all aspects of Phase I site assessments. These studies involved consideration of present and former site usage by performing a site and area reconnaissance; interviewing past and present owners; reviewing environmental information provided by federal, state and local regulatory agencies; researching archived historical data including city directories and historical fire insurance maps; interpreting aerial photographs; and evaluating the site's geologic and hydrogeologic characteristics. Mrs. Christian also has experience in performing various aspects of Phase II site assessments and investigations, asbestos services, lead-based paint services, mold services and radon sampling services, and has experience with ESA Department management.

Mrs. Christian is responsible for the management and overview of over 450 environmental site assessments per year throughout the U.S., and has participated in more than 2,900 Phase I projects. She has experience with projects ranging from agricultural, residential and commercial properties, to industrial manufacturing, EPA Brownfield sites, PST facilities, LPST facilities, RCRA hazardous waste generators, oil and gas field properties, to wind and solar properties.

Mrs. Christian has experience in client interaction and marketing with numerous clients including private land owners, developers, local municipalities, major retail chains and large scale lending institutions. She is proficient in the coordination of site activities with local, state and federal regulatory agencies.

PROJECT EXPERIENCE

TRANSPORTATION

High-Five TXDOT Development – Dallas, Texas
Project Manager for the High-Five TXDOT ESA at the intersection of I.H. 635 and U.S. 75 in Dallas, Texas.
Professional Services Completed: 2000
Construction Completed: May 2005

DFW Connector Development – Grapevine, Texas
Project Manager and overview for the DFW Connector 56 ESAs at the interchange of S.H. 114 and S.H. 121 in Grapevine, Texas.
Professional Services Completed: 2010
Construction Completed: March 2014

COMMERCIAL/RETAIL/FINANCIAL/TELECOMMUNICATIONS

ESA Portfolios
Project Manager for numerous ESAs conducted in conjunction with the acquisition of numerous convenience store/gasoline service stations, light industrial office/warehouses, industrial manufacturing facilities, newspaper/printing facilities, apartment complexes, medical office buildings, agricultural facilities, vacant land, and telecommunication tower sites, etc. in Texas and the U.S.
Professional Services Completed: 1996-2018

Ranch and Large-Scale Properties - Texas
Project Manager and overview of ESAs on multiple ranch and large-scale properties ranging in size from 1,000 acres to 170,000 acres.
Professional Services Completed: 2009 and 2017

EDUCATION

Bachelor of Science, Geology, 1995, University of Texas at Arlington

REGISTRATIONS

Professional Geoscientist: Texas, No. 222

CERTIFICATIONS

EPA Accredited Asbestos Inspector since 1997

TDSHS Licensed Asbestos Inspector (License No. 60-1732)

TDSHS Lead Inspector and Risk Assessor Training Program (Certificate No. 00007)

TDSHS Licensed Lead Risk Assessor (License No. 2070466)

TDSHS Licensed Mold Assessment Technician (License No. MAT1059)

40-Hour OSHA Hazardous Waste Operations Training

University of Houston/TCEQ Texas Risk Reduction Program (TRRP) Modules 1 and 2

PEC Safeland USA Training Course

8-Hour NORM Surveyor Training

AFFILIATIONS

North Texas Association of Environmental Professionals, 2005-2017

Society of Texas Environmental Professionals, 2007-2017

WORK HISTORY

Terracon Consultants, Environmental Department Manager 2019-present; Due Diligence Manager 2017-2019 (Lubbock); Phase I ESA Group Manager, 2016-2017, Senior Project Manager of ESA Services, 2006-2015; Project Geologist, 1999-2006 (Dallas, TX)

HBC Engineering, Inc. – Dallas, TX, Project Geologist, 1995-1999

Rachelle K. Christian, P.G. (continued)

PUBLIC ENTITIES

Brownfields Redevelopment
Project Manager for numerous downtown Dallas and Fort Worth ESAs, including sites for the American Airlines Center (AAC), as well as in Greenville and Arlington, Texas, and for West Central Texas Council of Governments (WCTCOG).
Professional Services Completed: 1999-2011

Utilities
Project Manager for proposed utility corridors for both water and sewer line ESAs.
Professional Services Completed: 2012-2015

ENERGY

Oil & Gas Due Diligence – Texas and New Mexico
Assisted in multiple Phase I ESAs on over 1,500 oil and gas well production locations, injection and disposal wells, tank batteries, compressor stations, gas plants, field offices, pipe yards in Southwest Texas, West Texas and New Mexico. Duties included field reconnaissance, regulatory records and historical review, and reporting.
Professional Services Completed: 2009-2018

Wind and Solar Power
Project Manager and overview for ESAs on proposed wind and solar power properties in Texas. Duties included field reconnaissance of acreage, associated oil/gas fields, historical review and reporting.
Professional Services Completed: 2009-2018

Power Plants
Manager Overview for several ESAs on mothballed power plants in West Texas and Project Manager for several active power plants in Texas, New York and Massachusetts.
Professional Services Completed: 2007, 2012, 2013 and 2015

CHRIS HEYNEN

STAFF SCIENTIST

PROFESSIONAL EXPERIENCE

Mr. Heynen is a Staff Scientist in Terracon's Chicago, Illinois Office. Duties include site reconnaissance, data collection, preparing technical reports, and client interaction. Mr. Heynen has experience in conducting Phase I Environmental Site Assessment (ESA) reports; National Environmental Policy Act (NEPA) reports; asbestos sampling and reporting; radio frequency modeling and monitoring and reporting; subsurface investigations and reporting; Indoor Air Quality Assessment reports; and water, soil, and air sampling.

PROJECT EXPERIENCE

Mr. Heynen has prepared Phase I ESAs for a wide range of properties and clients. These assessments focused on evaluating site conditions, potential off-site liabilities, and environmental control systems in order to advise prospective buyers, operators, and owners of potential and existing environmental concerns. His assessment experience includes residential, commercial, industrial, utility, and telecommunications developments.

In addition to environmental assessments, Mr. Heynen has experience conducting NEPA Compliance Reviews. NEPA Compliance Reviews include an analysis of historical properties, wetlands, endangered species habitat, floodplains, and other areas of environmental concern for proposed telecommunications installations. His asbestos experience consists of bulk sampling at proposed telecommunications installations, as well as residential and commercial properties. Radio frequency / electromagnetic emissions work includes modeling of electromagnetic emissions based on equipment specifications and field monitoring of existing telecommunications installations to determine on-site levels. Other areas of experience include subsurface investigations; Indoor Air Quality Assessments; and water, soil, and air sampling.

Education

BA - Biology, Minors - Environmental Studies and Geography
Augustana College, 2006

Certifications/Training

OSHA 40-Hour HAZWOPER

Illinois and Indiana Licensed Asbestos Building Inspector

Work History

Terracon, Chicago, Illinois, Staff Scientist, 2019-Present

EBI Consulting, Chicago, Illinois, Scientist II, 2010-2018

Trileaf, Bensenville, Illinois, Environmental Specialist, 2010

Environ, Chicago, Illinois, Associate, 2007-2009

Terracon

FILE COPY

20-70891
0316715228-Cook
Chicago/City of Chicago/Old City
Pound-Green ERA
SR/TECH

Illinois Environmental Protec

Bureau of Land • 1021 North Grand Avenue East • P.O. Box 19276 • Spring

Site Remediation Program (SRP)
Application and Services Agreement (DRM-1) Form

For Illinois EPA Use:
Log No. _____
____ $500 Advance Partial Payment Included
____ DRM-2 SRP Form Included
____ DR--3 Request for Assessment Included

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Remedial Project Management Section at the above address.

Site Identification:

Site Name: Proposed Anaerobic Digester Facility County: Cook
Street Address: 650 W. 83rd Street P.O. Box: _____
City: Chicago State: IL Zip Code: 60620 Approx. site size (acres) 9
Illinois Inventory ID Number: 0316715228 USEPA ID Number _____
Site Base Map Attached: ☑ Yes ☐ No Illinois EPA Permit(s): _____
LUST/IEMA Incident Number(s), if applicable: _____

I. Remediation Applicant ("RA"):

RA's Name: Mr./Ms. Mr. Jason Feldman Title: Director
Company: Green Era Educational NFP
Street Address: 218 N. Jefferson Street, STE. 300 P.O. Box: _____
City: Chicago State: IL Zip Code: 60661 Phone: (312) 544-9218
FEIN or SSN: 46-2580661

I hereby certify that I am authorized to sign this application and services agreement. I certify that the proposed project meets the eligibility criteria set forth in Section 58.1(a)(2) of the Environmental Protection Act (415 ILCS 5/58.1(1)(2)) and regulations promulgated thereunder and that this submittal and all attachments were prepared at my direction. In consideration for the Illinois EPA's agreement to provide (subject to applicable law, available resources, and receipt of the advance partial payment) review and evaluation services for activities carried out pursuant to Title 17 of the Illinois Environmental Protection Act (415 ILCS 5/58-58.12), I agree to:

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE
MAR 03 2020
REVIEWER KAJ

(1) Conform with the procedures of Title 17 of the Illinois Environmental Protection Act (415 ILCS 5/58 - 58.12) and implementing regulations;

(2) Allow for or otherwise arrange site visits or other site evaluations by the Illinois EPA when requested;

(3) Pay any reasonable costs incurred and documented by the Illinois EPA in providing such services; and

(4) Make an advance partial payment to the Illinois EPA for such anticipated services provided in Section V of this application.

As the RA, I understand that I may terminate this services agreement at any time, by notifying the Illinois EPA in writing that services previously requested under the services agreement are no longer wanted. Within 180 days of receipt of the notice, the Illinois EPA shall provide me with a final invoice for services provided until the date of receipt of such notification.

To the best of my knowledge and belief, this request and all attachments are true, accurate and complete. I hereby certify that I have the authority to enter into this agreement.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent conviction is a Class 3 felony. (415 ILCS 5/44(h)).

RA's Signature: _____ Date: 12-18-19

RECEIVED
JAN 09 2020
IEPA/BOL

***In addition to the fees applicable under this Services Agreement, the recipient of a No Further Remediation (NFR) Letter must pay to the Illinois EPA an NFR Assessment in the amount of the lesser of $2500 or an amount equal to the costs incurred by the Illinois EPA under this Agreement (35 IAC 740.615)**

IL 532 2536
LPC 565 5/14

III. Project Objectives:

A. Release Letter Requested.

Please complete one of the subsections by checking applicable boxes and including other information (if necessary, additonal information may be attached to this application form):

☑ Comprehensive No Further Remediation ("NFR") Letter

☐ Focused NFR Letter
Identify the focused contaminants of concern by checking the applicable box(es):

☐ Volatiles ☐ BTEX ☐ PCBs ☐ Metals ☐ Semivolatiles ☑ PNAs
☐ Pesticides ☐ Other (identify) _____

☐ 4(y) Letter
Identify the focused contaminants of concern by checking the applicable box(es):

☐ Volatiles ☐ BTEX ☐ PCBs ☐ Metals ☐ Semivolatiles ☐ PNAs
☐ Pesticides ☐ Other (identify) _____

Identify the media of concern by checking the applicable box(es):

☐ Soil ☐ Sediments ☐ Other: _____

Identify the actions (e.g. drum removal, spill response, etc.):

B. Identify any support services being sought from the Illinois EPA in addition to the review and evaluation services. If necessary, additional information may be attached to this application form.

☑ No additional support services are being sought
☐ Assistance with community relations
☐ Sample collection and analyses
☐ Other (identify): _____

C. Anticipated Schedule

SRP Document	Projected Date of Receipt by Illinois EPA
Site Investigation Report	May 29, 2015
Remediation Objectives Report	May 29, 2015
Remedial Action Plan	January 2020
Remedial Action Completion Report	September 2021

D. Identify the current and post-remedation uses of the remediation site. If necessary, additional information may be attached to this application form.

Current Use:
Vacant Site

Post-Remediation Use:
Anaerobic Digester and Ancillary Features

IV. Written Permission from the Property Owner (check one of the applicable boxes and provide additional information):

☑ RA is the property owner of the remediation site identified in Section 1 of this application

☐ RA is **not** the property owner of the remediation site identified in Section 1 of this application

Property Owner's Name: Mr./Ms. _____ _____ Title: _____

Company: _____

Street Address: _____ P.O. Box: _____

City: _____ State: _____ Zip Code: _____ Phone: _____

I hereby certify that the RA has my permission to enroll the site identified in Section 1 of this application into the Illinois EPA Site Remediation Program. I certify that the RA and designated representatives have permission to enter the indicated premises for the pupose of conducting remedial investigations or activities.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent conviction is a Class 3 felony. (415 ILCS 5/44(h)).

_____ _____

Owner's Signature: Date:

For multiple property owners, attach additional sheets containing all the information above along with a signed, dated certification for each.

V. Advance Partial Payment:

The RA shall select one of the following advance partial payment plans:

☑ Plan 1: A $500 advance partial payment is included with this application. Please make the check payable to: Illinois Environmental Protection Agency". Please include "For Deposit in the Hazardous Waste Fund" and the Remedation Applicant's FEIN or SSN on the check; or

☐ Plan 2: Request that the Illinois EPA determine the appropriate partial payment (i.e., approximately one-half of the total anticipated costs of the Illinois EPA, not to exceed $5,000). A completed DRM-3 form ("Request for Assessment of Advance Partial Payment for Anticipated Services") must accompany this application so that the Illinois EPA may determine the appropriate advance partial payment specific to the services requested.

If this application contains plans and reports for review and evaluation by the Illinois EPA, a completed DRM-2 Form must also accompany this submittal.

FILE COPY

20-70891
0316715228-Cook
Chicago/City of Chicago/Old City
Pound-Green ERA
SR/TECH

Illinois Environmental Protec

Bureau of Land • 1021 North Grand Avenue East • P.O. Box 19276 • Sprir.

Site Remediation Program Form (DRM-2)
(To be Submitted with all Plans and Reports)

You may complete this form online, save a copy, print, sign and mail it to the address above.

I. Site Identification:

Site Name: Proposed Anaerobic Digester Facility

Street Address: 650 W. 83rd Street P.O. Box: _____

City: Chicago State: IL Zip Code: 60620 Phone: _____

Illinois Inventory ID Number: 0316715228 IEMA Incident Number: _____

II. Remediation Applicant:

Applicant's Name: Mr./Ms. Mr. Jason Feldman

Company: Green Era Educational NFP

Street Address: 218 N. Jefferson Street, STE. 300 P.O. Box: _____

City: Chicago State: IL Zip Code: 60661 Phone: (312) 544-9218

Email Address: jason@greenerapartners.com

I hereby request that the Illinois EPA review and evaluate the attached project documents in accordance with the terms and conditions of the Environmental Protection Act (415 ILCS 5), implementing regulations, and the review and evaluation services agreement.

Remediation Applicant's Signature: _____ Date: 12-18-19

III. Contact Person for Remediation Applicant:

Contact's Name: Mr./Ms. Mr. Jason Feldman

Company: Green Era Educational NFP

Street Address: 218 N. Jefferson Street, STE. 300 P.O. Box: _____

City: Chicago State: IL Zip Code: 60661 Phone: (312) 544-9218

Email Address: jason@greenerapartners.com

Contact Person for Consultant:

Contact's Name: Mr./Ms. Mr. Richard O'Brien, P.E.

Company: Terracon Consultants, Inc.

Street Address: 650 W. Lake Street, STE. 420 P.O. Box: _____

City: Chicago State: IL Zip Code: 60661 Phone: (312) 575-0014

Email Address: rmobrien@terracon.com

IV. Review & Evaluation Licensed Professional Engineer or Geologist ("RELPEG"), if applicable:

RELPEG's Name: Mr./Ms. _____

Company: _____

Street Address: _____ P.O. Box: _____

City: _____ State: _____ Zip Code: _____ Phone: _____

Email Address: _____

V. Project Documents Being Submitted:

Document Title: Remedial Action Plan Addendum
Date of Preparation of Plan or Report: January 2020
Prepared by: Terracon Consultants, Inc.
Prepared For: Green Era Educational NFP

Type of Document Submitted:

- ☐ Site Investigation Report - Comprehensive
- ☐ Site Investigation Report - Focused
- ☐ Remediation Objectives Report - Tier 1 or 2
- ☐ Remediation Objectives Report - Tier 3
- ☑ Remedial Action Plan
- ☐ Remedial Action Completion Report
- ☐ Sampling Plan
- ☐ Health and Safety Plan
- ☐ Community Relations Plan
- ☐ Risk Assessment
- ☐ Containment Fate & Transport Modeling
- ☐ Other: _____

Document Title: _____
Date of Preparation of Plan or Report: _____
Prepared by: _____
Prepared For: _____

Type of Document Submitted:

- ☐ Site Investigation Report - Comprehensive
- ☐ Site Investigation Report - Focused
- ☐ Remediation Objectives Report - Tier 1 or 2
- ☐ Remediation Objectives Report - Tier 3
- ☐ Remedial Action Plan
- ☐ Remedial Action Completion Report
- ☐ Sampling Plan
- ☐ Health and Safety Plan
- ☐ Community Relations Plan
- ☐ Risk Assessment
- ☐ Containment Fate & Transport Modeling
- ☐ Other: _____

Document Title: _____
Date of Preparation of Plan or Report: _____
Prepared by: _____
Prepared For: _____

Type of Document Submitted:

- ☐ Site Investigation Report - Comprehensive
- ☐ Site Investigation Report - Focused
- ☐ Remediation Objectives Report - Tier 1 or 2
- ☐ Remediation Objectives Report - Tier 3
- ☐ Remedial Action Plan
- ☐ Remedial Action Completion Report
- ☐ Sampling Plan
- ☐ Health and Safety Plan
- ☐ Community Relations Plan
- ☐ Risk Assessment
- ☐ Containment Fate & Transport Modeling
- ☐ Other: _____

VI. Professional Engineer's or Geologist's Seal or Stamp:

I attest that all site investigations or remedial activities that are subject of this plan(s) or report(s) were performed under my direction, and this document and all attachments were prepared under my direction or reviewed by me, and to the best of my knowledge and belief, the work described in the plan and report has been designed or completed in accordance with the Illinois Environmental Protection Act (415 ILCS 5), 35 Ill. Adm. Code 740, and generally accepted engineering practices or principles of professional geology, and the information presented is accurate and complete.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 Felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Engineer's or Geologist's Name: Richard O'Brien, P.E.

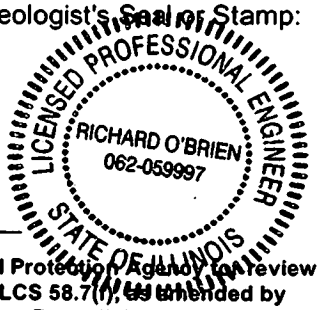
Company: Terracon Consultants, Inc.

Registration Number: 062.059997 Phone: 312.575.0014

License Expiration Date: 11/30/2021

Signature: _____ Date: 1/21/2020

Professional Engineer's or Geologist's Seal or Stamp:



Note: The authority of a Licensed Professional Geologist to certify documents submitted to the Illinois Environmental Protection Agency for review and evaluation pursuant to Title XVII of the Environmental Protection Act is limited to Site Investigation Reports (415 ILCS 58.7(f), as amended by P.A. 92-0735, effective July 25, 2002. A Licensed Professional Geologist cannot certify Remediation Objectives Reports, Remedial Action Plans or Remedial Action Completion Reports.

All information submitted is available to the public except when specifically designated by the Remediation Applicant to be treated confidentially as a trade secret or secret process in accordance with the Illinois Compiled Statutes, Section 7(a) of the Environmental Protection Act, applicable Rules and Regulations of the Illinois Pollution Control Board and applicable Illinois EPA rules and guidelines. The Illinois EPA is authorized to require this information under Sections 415 ILCS 5/58 - 58.12 of the Environmental Protection Act and regulations proumulgated thereunder. Disclosure of this information is required as a condition of participation in the Site Remediation Program. Failure to do so may prevent this form from being processed and could result in your plan(s) or report(s) being rejected. This form has been approved by the Forms Management Center.

FILE COPY

20-70891
0316715228-Cook
Chicago/City of Chicago/Old City
Pound-Green ERA
SR/TECH

Terracon

January 21, 2020

Illinois Environmental Protection Agency
Bureau of Land
Remedial Project Management Section
Site Remediation Program
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

Attention: Ms. Tammy Smith
P: (217) 524-4862
E: Tammy.Smith@Illinois.gov

RE: **Remedial Action Plan Addendum**
650 West 83rd Street
Chicago, Cook County, Illinois
LPC 0316715228—Cook County
Terracon Project No.: A2177092

Dear Ms. Smith:

Terracon Consultants, Inc. (Terracon) is pleased to submit this Remedial Action Plan Addendum letter (RAP Addendum) for the above-referenced site (the site). The RAP Addendum includes new project information and an updated development plan for the site. Terracon conducted this work on behalf of the current site owner and Remediation Applicant (RA), Green Era Educational NFP, as a follow up to the previously approved Comprehensive Site Investigation Report, Remediation Objectives Report, and Remedial Action Plan (CSIR/ROR/RAP) dated May 29, 2015. IEPA DRM-1 and DRM-2 forms are included in Appendix A.

1.0 PROJECT INFORMATION

The site consists of approximately 9 acres of fenced vacant land (Cook County Permanent Index Numbers [PINs] 20-33-119-024, 20-33-124-001 and 20-33-124-002) at the northwest corner of South Wallace Street and West 83rd Street, east of the Rock Island District Metra Rail line. The site was developed and operated as an International Harvester industrial site from approximately the early 1900s through the 1920s. The City of Chicago (City) subsequently used the property as an automobile impound lot from at least 1962 until 2009. Since 2009, the site has been vacant land used for temporary landscape waste storage by the City.

RECEIVED
JAN 22 2020
IEPA/BOL

The CSIR/ROR/RAP proposed in-situ treatment of lead to reduce leachable lead concentrations below hazardous waste criteria, excavation of soil with polynuclear aromatic hydrocarbon (PNA) concentrations above natural attenuation levels, engineered barriers, an on-site groundwater use restriction through use of the City of Chicago's groundwater ordinance, and the establishment of a soil management zone (SMZ) to address impact at the site above the remediation objectives (ROs). IEPA approved the CSIR/ROR/RAP on August 20, 2015.

Green Era Educational NFP (Green Era) acquired the three site parcels on December 16, 2015 from the City and has been in the process of completing construction plans for an anaerobic digester facility. Green Era applied for a Revolving Loan Fund, which prompted IEPA to update the review of the 2015 CSIR/ROR/RAP. IEPA issued a letter dated September 5, 2017 providing comments based on the updated review. In February 2018, Terracon also completed additional soil sampling to address areas that were previously inaccessible as reported in the 2015 CSIR/ROR/RAP.

This RAP Addendum provides supplemental soil data results, updates the new site owner's development plans, proposes the use of an alternative engineered barrier and new Tier 2 RO, and provides responses to IEPA's comments from their letter dated September 5, 2017.

2.0 REMEDIAL ENHANCEMENT SOIL SAMPLING

As stated in the 2015 CSIR/ROR/RAP, soil sampling conducted by Terracon in February 2015 could not be completed due access restrictions around borings B-1, B-2, B-3 and B-36. The soil sampling was proposed to further evaluate potential exceedances for the soil component of the groundwater ingestion exposure pathway and verify the extend of hazardous lead surrounding B-3. SPLP analysis was proposed for cadmium and selenium from 4-6 feet bgs near sample B-3; copper, mercury, and zinc from 1-3 feet bgs near samples B-1 and B-2; beryllium, and manganese from near samples B-1 and B-2 from 4-6 feet bgs; and barium from 1-3 feet bgs near B36. These intervals represent the highest concentrations of these constituents detected at the site where no pH-specific soil remediation objective (SRO) was available for comparison. In addition, to confirm the extent of hazardous waste lead surrounding B-3, samples were planned to be analyzed for TCLP lead from 4-6 feet bgs from B-1 and B-2 for horizontal delineation, and from 6-8 feet bgs at B-3 for vertical delineation. Since that time, the access restrictions were removed, and Terracon mobilized to the site to collect additional soil samples.

On February 13, 2018, four soil borings were advanced at the site and placed immediately adjacent to the above-referenced previous locations: B-1b to 5.5 feet below ground surface (bgs); B-2b to 8 feet bgs, B-3b to 12 feet bgs, and B-36b to 8 feet bgs. Soil boring locations are shown in Exhibit 1 and the boring logs are provided in Appendix B. The samples were conveyed under chain of custody to STAT Analysis Corporation, an IEPA-accredited laboratory (accreditation number 100445), for analysis for synthetic precipitation leaching procedure (SPLP) inorganics and TCLP lead at select samples as

noted above. Results of the analysis are compared to the Tier 1 GROs for Class I groundwater and hazardous waste criteria in Table 1, and the laboratory analytical report is provided as Appendix C.

As shown in attached Table 1, results of the SPLP analyses were below the Tier 1 GROs for each of the metals analyzed. As such, transport modeling noted in the 2015 ROR is not required for these constituents. Results of the TCLP lead analyses indicated exceedances of the Class I GRO but were below the criteria for characteristic hazardous waste. The B-1b, B-2b, and B-3b boring locations are within the proposed hazardous waste lead treatment area. Further TCLP lead sampling will be conducted as part of the treatment outlined in the previously approved RAP. Transport modeling will be conducted following lead treatment sampling, with results to be provided in the Remedial Action Completion Report (RACR).

3.0 REVISED SITE DEVELOPMENT PLAN

Since the submittal of the CSIR/ROR/RAP in May 2015 and the subsequent acquisition of the site by Green Era, development plans have been prepared for a proposed future anaerobic digester facility. The future structures and associated paved and landscaped areas will be located on the western and northern portions of the site. A retention pond will be located in the southeast portion of the site, and the remainder of the eastern portion of the site will be landscaped, with greenhouse/hoop houses on the landscaped areas. Exhibit 2 shows the proposed development plan.

4.0 EXTENT OF REQUIRED ENGINEERED BARRIER

In the 2015 CSIR/ROR/RAP, engineered barriers were planned throughout the remediation site to exclude the industrial/commercial exposure route. Upon further evaluation of the data to the Tier 1 SROs, the original extent was overly conservative and based on the data; engineered barriers are not required in portions of the site located in the southeast corner and western portions of the site. After recent receipt of a civil engineering survey of the property, it is noted that a concrete retaining wall, approximately 10 feet in height, is located along the southwestern and west-central portion of the remediation site and extending approximately 7 -16 feet east of the property boundary in an inaccessible area where no work is planned. Engineered barriers are not required in these areas without identified soil with industrial/commercial exceedances. Exhibit 3 identifies the updated area of soil exceeding the industrial/commercial ingestion exposure route. Exhibit 4 depicts the proposed engineered barriers.

Further, it is noted that no exceedances of the industrial/commercial indoor inhalation exposure route were identified, and the area identified with naphthalene exceeding the industrial/commercial outdoor inhalation exposure route will be excavated for landfill disposal during remedial action to address the attenuation capacity exceedances. Additionally, in-situ remediation of soils with hazardous concentrations of lead will be addressed per the IEPA-approved 2015 RAP prior to engineered barrier installation.

4.1 Tier 2 RO for Benzo(a)pyrene Industrial/Commercial Ingestion Exceedances

Engineered barriers are proposed in areas of the site identified to contain concentrations of PNAs, arsenic, and lead at concentrations exceeding Tier 1 SROs for the industrial/commercial ingestion exposure route. It is noted that in the south-central portion of the site, the PNA benzo(a)pyrene was the only constituent identified to exceed the industrial/commercial ingestion exposure route. Since the 2015 CSIR/ROR/RAP, the United States Environmental Protection Agency (USEPA) issued *Toxicological Review of Benzo(a)pyrene* in January 2017, which evaluated the best available research on the carcinogenic chemical, excerpts of which are included in Appendix D.

The USEPA document included a derivation of the lifetime oral cancer slope factor, which represents the plausible upper bound on the true risk for humans and is a key input for the derivation of the ingestion exposure route soil RO in IEPA's Tiered Approach to Corrective Action Objectives (TACO). Per the study, "the oral slope factor of 1 per mg/kg*day...was selected as the factor with the highest sensitivity (most sensitive) among the slope factors derived." This 1.0 oral slope factor for benzo(a)pyrene is now included in IEPA's Toxicity Values for Tier 2 and Tier 3 Calculations[1].

Terracon used the updated oral slope factor to calculate a Tier 2 SRO for benzo(a)pyrene for the industrial/commercial ingestion exposure route using TACO SSL Equation S3 as provided in 35 IAC Part 742, Appendix C. The equation is provided below.

TACO Equation S3: Tier 2 RO for Carcinogenic Contaminants – industrial/commercial soil ingestion exposure route =

$$\frac{TR \bullet BW \bullet AT_c \bullet 365\frac{d}{yr}}{SF_o \bullet 10^{-6}\frac{kg}{mg} \bullet EF \bullet ED \bullet IR_{soil}}$$

Table 4-1 summarizes the inputs for the calculations. Printouts of the S3 result are attached in Appendix D.

Table 4-1 Modeling Input Parameters: S3

Parameter	Value
TR – Target Cancer Risk - TACO Default	1.0 x 10^{-6} (unitless)
ATc – Averaging Time for Carcinogens - TACO Default	70 years
EF – Exposure Frequency - TACO Default for industrial/commercial use	250 days/year
ED – Exposure Duration for ingestion of carcinogens – TACO Default for industrial/ commercial use	25 years
BW – Body Weight – TACO Default for industrial/ commercial use	70 kilograms (kg)
IR_{soil} – Soil Ingestion Rate – TACO Default for industrial/ commercial use	50 milligrams (mg)/day
Oral Slope Factor [1]	1.0 $(mg/kg*day)^{-1}$

[1] https://www2.illinois.gov/epa/topics/cleanup-programs/taco/Documents/Toxicity%20Values%20for%20Tier%202%20and%20Tier%203%20Calculations.xls

Table 4-2 summarizes the result of the S3 calculation and the Tier 2 SRO.

Table 4-2 Calculation Results: S17 for the Industrial/Commercial Ingestion Exposure Route

Chemical	Tier 1 Soil Remediation Objective (mg/kg)	Background Concentration (Chicago)	Tier 2 Soil Remediation Objective (mg/kg)
Benzo(a)pyrene	0.8	1.3	5.72

Results from equation S3 produced a Tier 2 SRO result greater than the Tier 1 SRO and Chicago-area background for benzo(a)pyrene which was utilized as the SRO in the 2015 CSIR/ROR/RAP. Therefore, the Tier 2 SRO was compared to benzo(a)pyrene soil results. The comparison resulted in removal of the following samples for PNAs exceeding the industrial/commercial ingestion exposure route: B-3 (1-3), B-3 (4-6), B-19 (1-3), B-20 (1-3), B-25 (1-3), B-25 (4-6), B-29 (1-3), B-31 (1-3), B-32 (1-3), B-33 (4-6), B-34 (1-3), B-37 (6-8), B-101 (6-8), B-122 (1-3), B-125 (1-3), and B-129 (1-3).

The comparison between the benzo(a)pyrene soil data results to the Tier 2 SRO is provided in attached Table 2. Some samples excluded by this comparison remain exceedances of the industrial/commercial ingestion exposure route due to inorganic impacts. However, the comparison did result in the removal of the need for an engineered barrier to exclude the industrial/commercial ingestion exposure route in the south-central portion of the site (near B-31 and B-25) as depicted on Exhibit 3.

5.0 ALTERNATIVE ENGINEERED BARRIER

In the 2015 CSIR/ROR/RAP, Terracon proposed that the engineered barriers in affected landscaped areas would consist of 3-feet of clean soil to exclude the industrial/commercial ingestion exposure route for PNAs, arsenic and lead. Based on the site redevelopment plan and the economic feasibility of properly disposing construction spoils and the top three feet across landscaped areas of the site, an alternative engineered barrier is proposed.

Prior to installation of the barrier, planned landscaped areas would be excavated to at least 18 inches below final planned grade. The subgrade will be visually inspected to remove objects identified that may puncture fabric and surveyed to verify the excavation extends to at least 18 inches below planned final elevation. The engineered barrier will include placement of a geotextile fabric and 18 inches of clean imported soil on top of the existing site soil.

The geotextile fabric chosen to cover the east-central berm and will be US 100NW-HVO Warning Barrier, manufactured by US Fabrics, Inc., or a comparable geotextile product. The US 100NW-HVO Warning Barrier is a nonwoven geotextile made up of polypropylene fibers. These fibers are needled to form a stable and durable network such that the fibers retain their relative position. It is non-biodegradable and resistant to most soil chemicals, acids and alkali with a pH range of 2 to 13. The US 100NW-HVO Warning Barrier has sufficient strength, thickness, and permeability to both prevent

exposure to soils remaining in place and allow sufficient drainage to meet civil engineering requirements. The geotextile will also serve as a visual indicator during future construction projects at the Remediation Site. Placement of the geotextile will include overlapping the edges between fabric sections a minimum of 6-12 inches, to be documented by Terracon field staff. A physical sample of the proposed warning barrier and the specification sheet is included in Appendix E.

In landscaped engineered barrier areas planned to have trees, a 3-foot engineered barrier will be placed instead of the geotextile fabric liner to prevent restriction of root growth. The 3-foot engineered barrier areas would be placed around each tree and be approximately 4-6 feet in diameter. The location of the trees is unknown at this time and would be provided in the RACR.

After placement of the geotextile, the landscaped engineered barrier areas will be backfilled with at least 18 inches of imported clean fill consisting of virgin stone and/or clean fill soil approved and field documented by Terracon. Imported virgin stone used to backfill the landscaped areas over the geotextile will be from a local quarry. The clean soil will have undergone prior sampling at a rate of one sample per 500 cubic yards and analyzed for the TCL, pH, and TCLP/SPLP metals as required. In order to be classified as clean for this remediation site, the analytical results must show that the reported concentrations are below the Tier 1 SROs for residential land use.

The location of the proposed engineered barrier is indicated in Exhibit 4. The barrier will be maintained by professional landscapers and damage that is identified will be promptly repaired.

The proposed alternative engineered barrier provides equivalent protection to three feet of clean soil by providing a defined maintainable physical separation between potential receptors and the contaminants of concern. The engineered barrier as proposed provides adequate equivalency to standard clean fill barriers in terms of preventing migration and exposure.

Green Era Educational NFP requests approval from the IEPA of the alternative engineered barrier, which is sought to accommodate the economic viability of this important redevelopment project. Documentation of the work is planned to be included in the RACR.

6.0 RESPONSE TO IEPA UPDATED REVIEW LETTER

The IEPA completed an updated review of the 2015 CSIR/ROR/RAP and provided comments in a letter issued on September 5, 2017. A copy of the IEPA letter is provided in Appendix F. The comments from IEPA are shown in *italics* below, with the Remedial Applicant's response to each comment in standard font.

1. *The sampling rate for clean soil is a sample every 500 yds^3, please adjust for this in the proposed budget plan.*

Response: As requested by IEPA, the proposed clean soil source will be tested at a ratio of one sample per 500 yds^3 of proposed import.

Additionally, the RA is considering use of a clean soil engineered barrier consisting of blending clean topsoil with exceptional quality biosolids (EQ biosolids) provided by the Metropolitan Water Reclamation District of Greater Chicago (MWRD). Per MWRD, EQ biosolids are a product of wastewater treatment that supplies organic matter and improves the structure and porosity of soils, which allows plants to more effectively utilize nutrients. EQ Biosolids meet the USEPA's 40 CFR Part 503 requirements for exceptional quality (EQ), which are based on comprehensive risk assessments that are protective of human health and the environment. The regulations establish levels of trace metals and pathogens that are based on scenarios of a person coming into contact with biosolids or food grown on land receiving biosolids. Additional information on the EQ biosolids is provided in Appendix G, which includes a 2004 letter from IEPA allowing for use for clean fill so long as the imported biosolids/soil mixture meets the IEPA clean fill remedial objectives. Since this letter, the State of Illinois passed the Exceptional Quality Biosolids Act streamlining the use of the material, resulting in no special permits needed.

The proposed mixture would consist of clean topsoil blended with biosolids at a 3:1 ratio and placed on site in clean fill engineered barrier areas in accordance with applicable requirements for biosolids. The blending may occur either off-site prior to import or on-site. One sample per every 500 yd^3 of blended material would be collected and submitted for laboratory analysis, and then verified by the results to meet IEPA clean fill objectives per the IEPA-approved RAP, prior to placement of the blended material on the Remediation Site." The RA is requesting IEPA input on potential use of EQ biosolids.

2. *The indoor inhalation exposure route was briefly mentioned in the report. To elaborate, it appears the areas with the highest mercury detection are on the eastern side of the site, near areas proposed for excavation and stabilization. There were no detections of mercury in groundwater or soil gas samples. Naphthalene was detected in one soil gas sample below objectives but was not detected in groundwater. The indoor inhalation exposure route does not appear to be of any potential threat to off-site migration. As for any site with detections of volatiles, there will be restriction that will require a slab-on-grade construction with no sump-pumps.*

   Response: The updated site development plan includes a building with a partial basement for mechanical equipment. As required for basements, the walls and floor will be constructed with a minimum of 10-centimeter-thick concrete. The proposed basement would have drain lines leading to a sump pit placed outside of the building footprint. Additional interior sump pits would be sealed in concrete to handle interior process water. Therefore, the sumps would not provide a pathway for the indoor inhalation exposure route.

3. *Details of the proposed Soil Management Zone (SMZ) needs to be submitted in addendum to the RAP. A figure depicting the three-dimensional boundaries is required, see 35 IAC 740.535 for all requirements.*

Response: Based on the revised site development plan, the RA proposes to create a SMZ to consolidate contaminated soils within the remediation site as an integral step to remediating the Brownfield property. In accordance with 35 IAC 740.535, soil that is the subject of a request for a SMZ shall be classified as a SMZ if the following the following requirements will be satisfied:

1) All contaminants of concern within the remediation site shall be identified by a comprehensive site investigation under Section 740.420;

Terracon's IEPA-approved CSIR/ROR/RAP dated May 29, 2015 identified the contaminants of concern for the remediation site. Soil exceeding Tier 1 SROs was identified throughout the property.

2) The horizontal and vertical dimensions of the soil management zone shall be defined;

All site soil was found to exceed SROs for the soil component to Class I groundwater exposure route at a minimum. Therefore, the proposed SMZs are defined as the soils within the entire site boundary, except for two areas: 1) the western strip of land located behind an existing concrete retaining wall between the site and the adjacent above-grade railroad, approximately 10 feet in height, and extending approximately 7 -16 feet east of the property boundary, in an inaccessible area where no work is planned, and 2) the areas identified on Exhibit 8 of the CSIR/ROR/RAP with attenuation and hazardous lead exceedances, which will be treated in accordance with the 2015 IEPA-approved RAP prior to site development activities.

Because there are areas of the site that do not exceed the industrial/commercial ingestion exposure route, two SMZs will be created as follows:

SMZ 1: Areas less the industrial/commercial ingestion exposure route SROs where no engineered barriers are required. SMZ 1 soil may be relocated within SMZ 1 or beneath an engineered barrier within SMZ 2 areas.

SMZ 2: Areas exceeding the industrial/commercial ingestion exposure route SROs where engineered barriers are required. SMZ 2 soil may be relocated beneath engineered barriers within SMZ 2. SMZ 2 soil cannot be placed in SMZ 1 areas.

The SMZs extends from the surface to approximately 50 feet bgs, the maximum depth of structural caisson spoils. Spoil soils and soil excavated to facilitate engineered

barriers in landscaped areas are proposed to be relocated to the eastern "hill area" depicted on Exhibit 5. Up to 26,000 cubic yards is proposed for relocation to the hill area. Soil relocated during the proposed construction, conducted after attenuation removal and hazardous lead treatment, are proposed to be placed in the SMZ hill area and covered by an alternative engineered barrier, which is further described in Section 3. The hill is anticipated to rise to a maximum of 8-11 feet above surrounding grade. The SMZ areas are depicted on Exhibit 5.

Geotechnical engineers will provide to the project team a stability analysis of the fill placed in the berm area as a part of this project. Recommendations will include that the slopes must be properly vegetated or covered in gravel to protect against surface erosion. In addition, previous geotechnical work was conducted for the project and facilitated building foundation / paved engineered barrier design and construction. A shallow water table was verified and dewatering is likely needed during soil excavation on site.

3) The uses of the soil management zone shall be defined;

The SMZ will be redeveloped as an anaerobic digester facility as detailed in Exhibit 2. The SMZ will be used to consolidate impacted soils. Spoils generated during construction of the landscaped engineered barriers and structural features are proposed to be relocated to the eastern "hill area" depicted on Exhibit 5. Soil relocated during construction, conducted after removal of soils exceeding the attenuation capacity of soil and hazardous lead treatment, are proposed to be placed in the SMZ hill area and covered by an alternative engineered barrier. Terracon's field inspectors will observe the relocation of soil and segregate areas for off-site landfill disposal if areas with free product or field evidence of significant impact are identified. This newly created contoured, landscaped area will be used as a landscaped area with urban agriculture hoop houses. The SMZ is proposed to be in effect until the NFR is perfected.

4) All contaminants of concern within the soil management zone shall satisfy the requirements of 35 Ill. Adm. Code 742.305(a) through (f);

5) All applicable requirements of 35 Ill. Adm. Code 742 shall be satisfied within the soil management zone (e.g., all exposure routes must be addressed; institutional controls and engineered barriers shall be in full compliance with 35 Ill. Adm. Code 742.Subparts J and K);

6) The SMZ will meet requirements of 35 IAC 740.535 6) A-D;

The soil management zone will be constructed, operated and maintained in a manner that prevents odor from occurring; minimizes fugitive emissions of particulate matter in

accordance with 35 Ill. Adm. Code 212.Subpart K and dust generation through use of water spray as needed based on conditions encountered during construction. The SMZ will prevent the generation of potentially contaminated runoff through use of an Erosion and Sediment Control Plan, which will include installation of silt fencing at the property boundaries, a 6-ft tall perimeter fence with screening, inspections, and other measures in accordance with the standards and specifications for soil and sedimentation control of local govemment agencies, procedures and standards for urban soil and sedimentation control in Illinois, and IEPA standards and specifications for soil erosion and sediment control. Measures will be taken as need so that the SMZ will not provide a breeding place or food source for vectors.

7) Within the soil management zone, management of soil containing hazardous wastes shall comply with the applicable requirements of the Resource Conservation and Recovery Act;

   Areas of the site identified to contain hazardous concentrations of lead will be excluded from the SMZ until successfully treated in place in accordance with RCRA requirements and per the IEPA-approved 2015 RAP prior to site development activities.

8) Soil containing contaminants of concern above the concentrations in 35 IAC 742.Appendix B, Table A (Tier 1 objectives for residential properties) or approved by the Agency pursuant to 35 Ill. Adm. Code 742.510(c) may not be treated or placed in any area where all contaminants of concern within the remediation site are at or below the concentrations in 35 Ill. Adm. Code 742.Appendix B, Table A (Tier 1 objectives for residential properties) or approved by the Agency pursuant to 35 Ill. Adm. Code 742.510(c).

   As provided in the IEPA-approved CSIR/ROR/RAP dated May 29, 2015, soil throughout the site exceeds Tier 1 SROs for the soil component to Class I groundwater at a minimum. Additionally, the existing soil proposed eastern hill area of the site exceeds Tier 1 remedial objectives, so consolidating soil within the SMZ will meet this requirement.

A summary of relocated soil volumes, origination, and final placement will be provided in the RACR. The alternative engineered barrier is described further in Section 3.0.

4. *Please provide a new DRM-1 Form with updated information and signatures for the Remedial Applicant and the property owner.*

   Response: An updated DRM-1 Form noting Green Era as the property owner is provided in Appendix A.

7.0 CLOSING

This RAP Addendum is being submitted based on a request by IEPA, a proposal for an alternative engineered barrier, updated site investigation data, and a new site development plan. Upon receipt of the IEPA's approval of this RAP Addendum, Green Era will begin construction activities at the site. The implementation of this alternative engineered barrier, and the other engineered barriers, institutional controls, and the building control technology proposed for the site in the CSIR/ROR/RAP, will be documented in the RACR that will be submitted to the IEPA.

We appreciate the opportunity to provide this RAP Addendum for IEPA approval. If you should have any questions or comments regarding this letter, please contact us at (312) 575-0014.

Sincerely,
Terracon Consultants, Inc.

Matt Weiss, P.G.
Project Geologist

Richard O'Brien, P.E.
Senior Environmental Engineer

Cc: Jason Feldman, Green Era Educational NFP

Attachments:

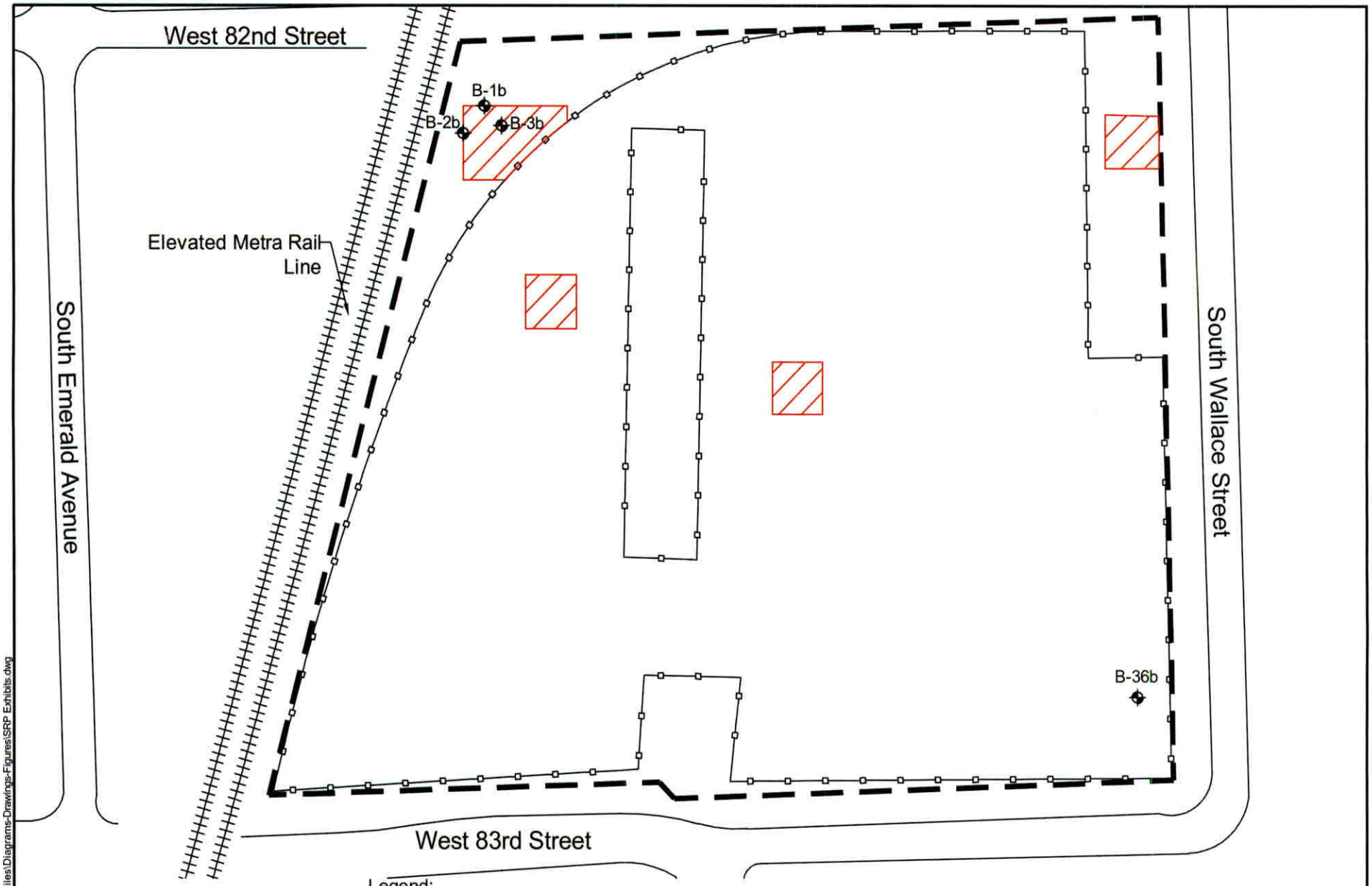
Exhibit 1 – Remedial Enhancement Investigation
Exhibit 2 – Proposed Development Diagram
Exhibit 3 – Industrial / Commercial Exceedances – Updated
Exhibit 4 – Extent of Required Engineered Barriers
Exhibit 5 – Soil Management Zone Diagram

Table 1 – Terracon Soil Analytical Results – Inorganics
Table 2 – Terracon Soil Analytical Results – SVOCs with Tier 2 Updates

Appendix A – IEPA DRM-1 and DRM-2 Forms
Appendix B – Boring Logs (2018)
Appendix C – Laboratory Analytical Reports
Appendix D – Tier 2 Equation S3
Appendix E – Proposed Geotextile Fabric Liner
Appendix F – IEPA Letter - Updated Review of CSIR/ROR/RAP, September 5, 2017
Appendix G – Information on MWRD Exceptional Quality Biosolids

Terracon

Exhibits



N:\Projects\2015\A2157000\Working Files\Diagrams-Drawings-Figures\SRP Exhibits.dwg

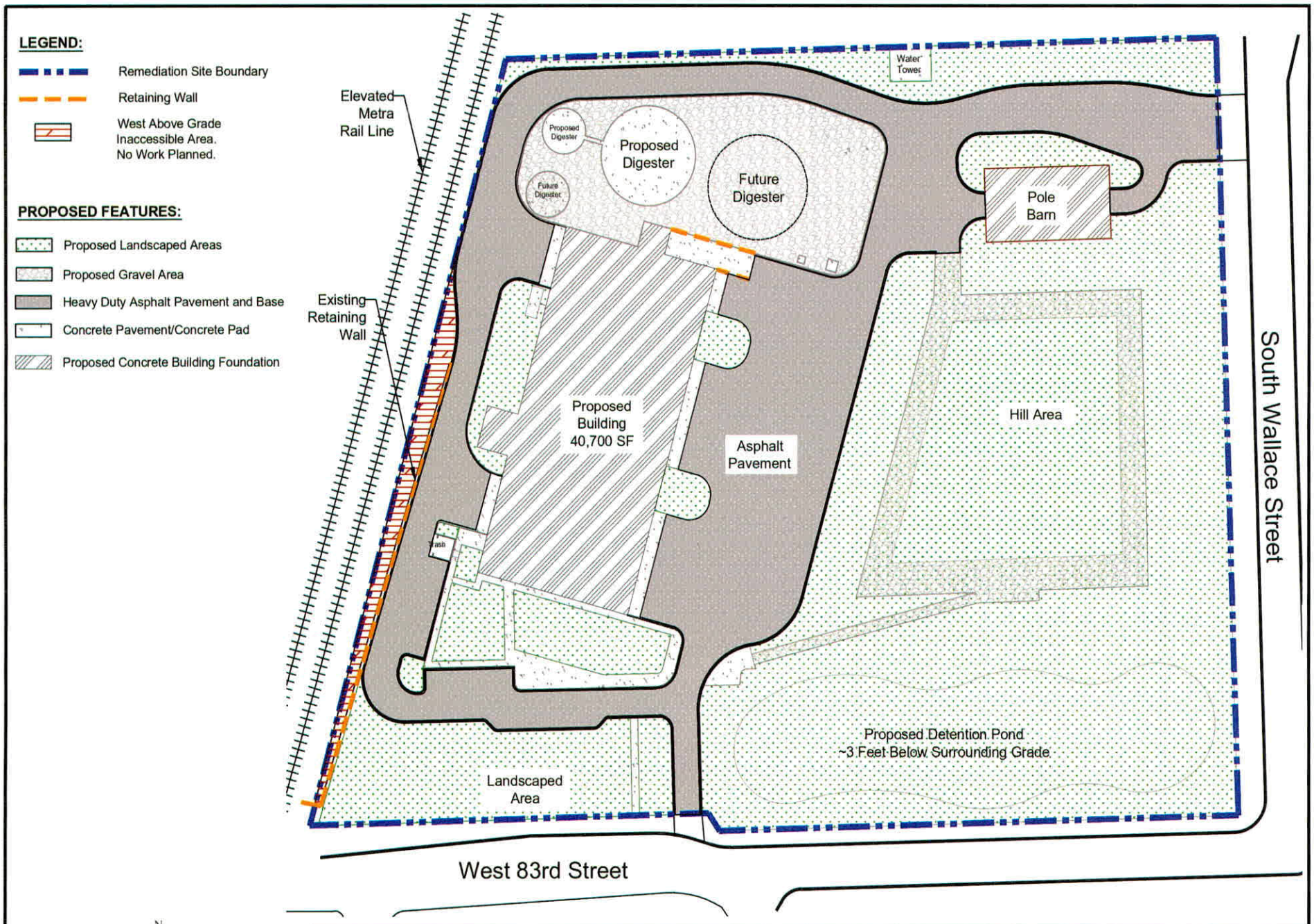
Project Mngr:	RMO
Drawn By:	SDM
Checked By:	RMO
Approved By:	RMO
Project No.	A2157000
Scale:	AS-SHOWN
Revised By:	RMO
Date:	February 5, 2019

Terracon
Consulting Engineers and Scientists
650 W. LAKE ST., SUITE 420 CHICAGO, ILLINOIS 60661
PH. (312) 575-0014 FAX. (312) 575-0111

REMEDIAL ENHANCEMENT INVESTIGATION

650 WEST 83RD STREET
CHICAGO, COOK COUNTY, ILLINOIS

EXHIBIT
1



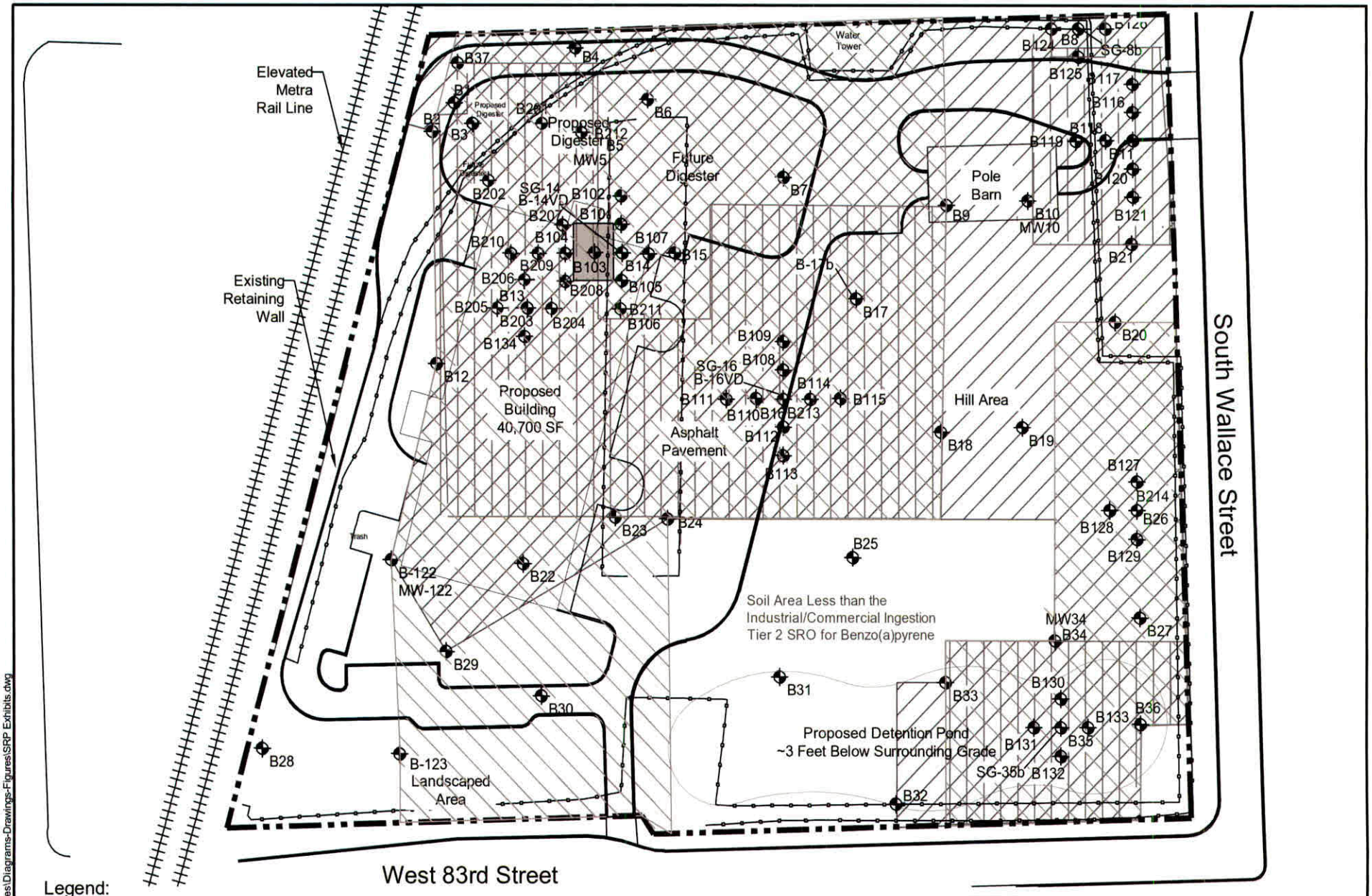
Project Mngr:	RMO
Drawn By:	SDM
Checked By:	RMO
Approved By:	RMO
Project No.	A2177092
Scale:	AS-SHOWN
Revised By:	
Date:	December 26, 2019

Terracon
Consulting Engineers and Scientists
650 W. LAKE ST., SUITE 420 CHICAGO, ILLINOIS 60661
PH. (312) 575-0014 FAX. (312) 575-0111

PROPOSED DEVELOPMENT DIAGRAM

650 WEST 83RD STREET
CHICAGO, COOK COUNTY, ILLINOIS

EXHIBIT 2



Legend:

- Remediation Site Boundary
- Approximate Boring Locations (2015)
- Approximate Boring Locations (2013)
- Soil Exceeding Tier 1/Tier 2 SROs - PNAs
- Soil Exceeding Tier 1 SROs - Naphthalene
- Soil Exceeding Tier 1 SROs - Arsenic
- Soil Exceeding Tier 1 SROs - Lead

N

0 100'

APPROXIMATE SCALE

N:\Projects\2015\A2157000\Working Files\Diagrams-Drawings-Figures\SRP Exhibits.dwg

Project Mngr:	RMO
Drawn By:	SDM
Checked By:	RMO
Approved By:	RMO
Project No.	A2177092
Scale:	AS-SHOWN
Revised By:	-
Date:	November 26, 2019

Terracon
Consulting Engineers and Scientists
650 W. LAKE ST., SUITE 420 CHICAGO, ILLINOIS 60661
PH. (312) 575-0014 FAX. (312) 575-0111

INDUSTRIAL / COMMERCIAL EXCEEDANCES - UPDATED

650 WEST 83RD STREET
CHICAGO, COOK COUNTY, ILLINOIS

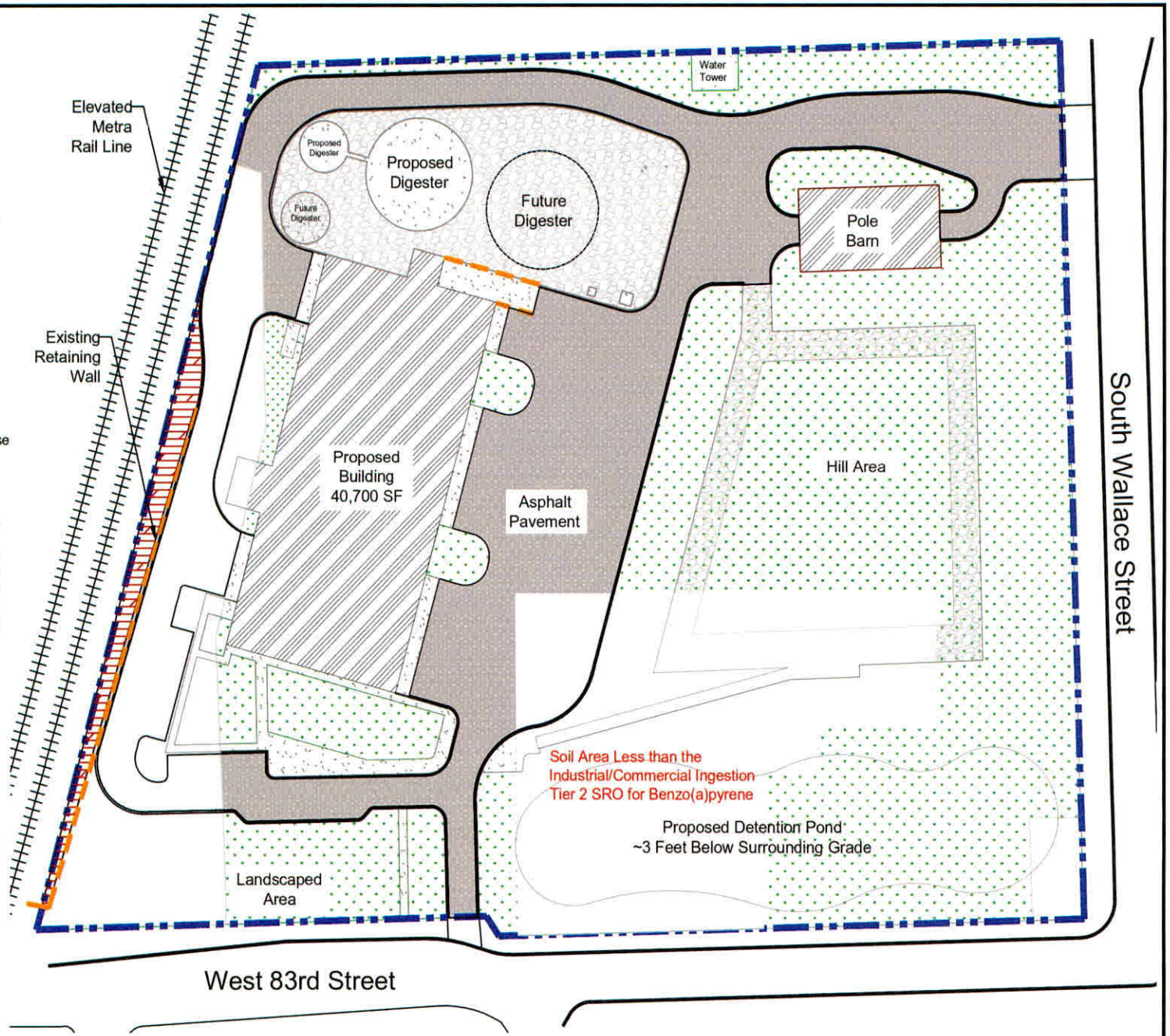
EXHIBIT 3

LEGEND:

- Remediation Site Boundary
- Retaining Wall
- West Above Grade Inaccessible Area. No Work Planned.

REQUIRED ENGINEERED BARRIERS:

- **Proposed Landscaped Areas:** Excavate to 18 inches below final grade and replace with geotextile and cover with 18 inches of clean fill.
- **Proposed Gravel Area:** Excavate to 18 inches below final grade and replace with geotextile and cover with 18 inches of gravel/clean fill.
- Heavy Duty Asphalt Pavement and Base
- Concrete Pavement/Concrete Pad
- **Proposed Concrete Building Foundation:** Full concrete building slab will be required for buildings constructed within the property boundary. Sump pits must be sealed air tight with silicone caulk and vented to the building's exterior



N

0 100'

APPROXIMATE SCALE

Project Mngr: RMO	Project No. A2177092	Terracon Consulting Engineers and Scientists	EXTENT OF REQUIRED ENGINEERED BARRIERS
Drawn By: SDM	Scale: AS-SHOWN	650 W. LAKE ST., SUITE 420 CHICAGO, ILLINOIS 60661	650 WEST 83RD STREET CHICAGO, COOK COUNTY, ILLINOIS
Checked By: RMO	Revised By:	PH. (312) 575-0014 FAX. (312) 575-0111	EXHIBIT 4
Approved By: RMO	Date: December 26, 2019		

LEGEND:

- Remediation Site Boundary
- Retaining Wall
- West Above Grade Inaccessible Area. No Work Planned.
- Approximate Extent of Soil Exceeding TCLP Hazardous Waste Criteria - Lead
- Approximate Extent of Subsurface Soil Exceeding Attenuation Capacity

Soil Management Zones:

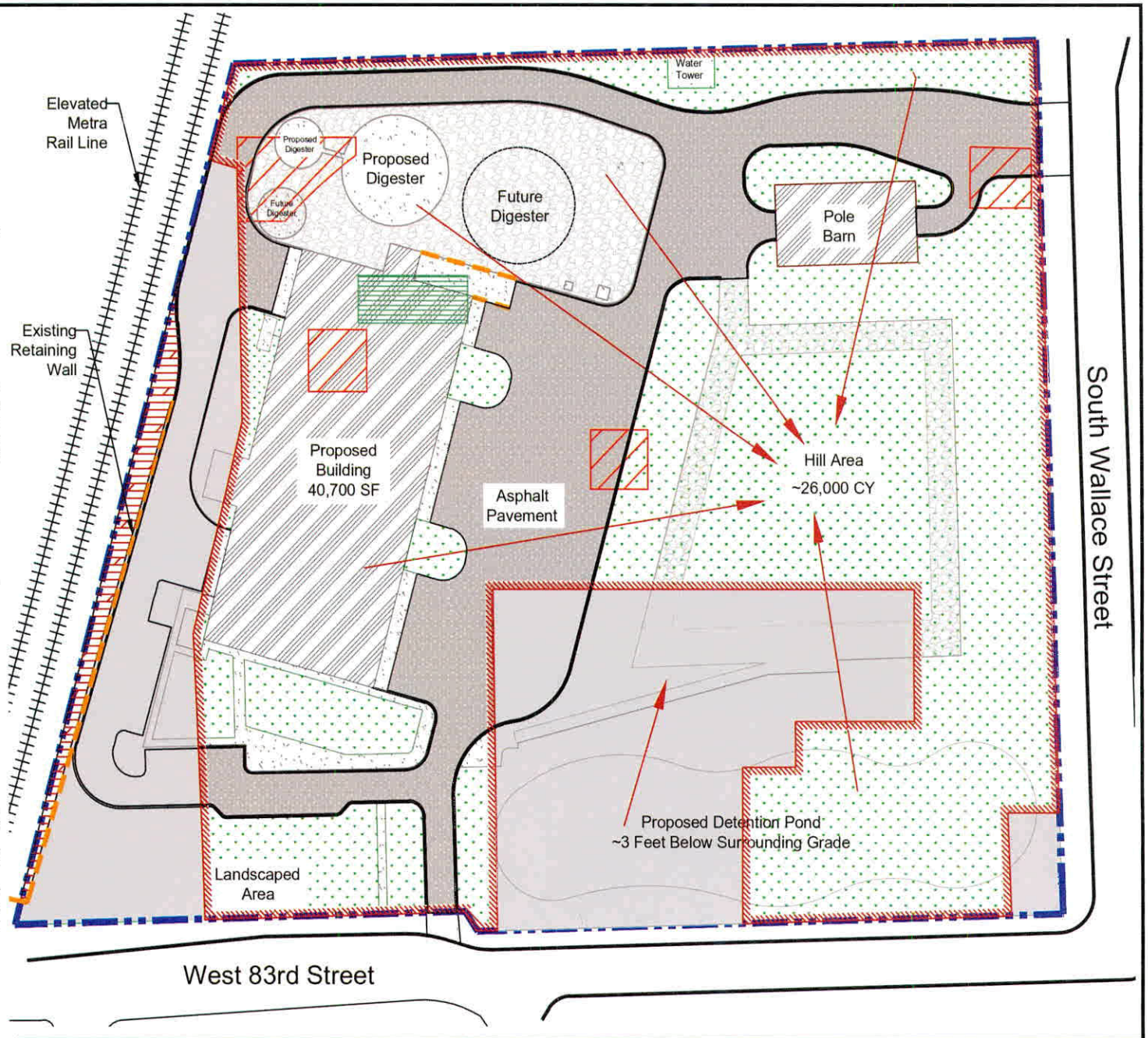
All site soil exceeds TACO Tier 1 Soil Remediation Objectives (SROs) for Soil Component Exposure Route at a minimum. Soil movement cannot take place until hazardous waste lead and attenuation remediation work per the IEPA-approved 2015 CSIR/ROR/RAP is complete.

- Planned Direction of Soil Movement

SMZ 1: Areas with soil less the industrial/commercial ingestion exposure route ROs where no engineered barriers are required. SMZ 1 soil may be placed under anywhere on site. SMZ 2 soil cannot be placed in SMZ 1 Areas.

SMZ 2: Areas with soil exceeding the industrial/commercial ingestion exposure route ROs where engineered barriers are required. SMZ 2 soil may be relocated under other engineered barriers in other SMZ 2 areas. SMZ 2 soil cannot be placed in SMZ 1 Areas.

1. Soil from areas like pond, buildings, digesters, etc. can be excavated and placed in the east-central hill area.
2. No site soil may be used in the top 18 inches as a clean fill engineered barrier.
3. Excess construction soil and remediation soil, generated within the remediation site boundary to be disposed off-site at an IEPA permitted Subtitle D Landfill.



N

0 100'

APPROXIMATE SCALE

Project Mngr: RMO	Project No. A2177092	Terracon Consulting Engineers and Scientists	SOIL MANAGEMENT ZONE DIAGRAM
Drawn By: SDM	Scale: AS-SHOWN	650 W. LAKE ST., SUITE 420 CHICAGO, ILLINOIS 60661	650 WEST 83RD STREET CHICAGO, COOK COUNTY, ILLINOIS
Checked By: RMO	Revised By:	PH. (312) 575-0014 FAX. (312) 575-0111	EXHIBIT 5
Approved By: RMO	Date: January 17, 2020		

Terracon

Tables

Table 1 - Terracon Soil Analytical Results - SPLP/TCLP Inorganics
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	Tier 1 Groundwater Remediation Objectives	Hazardous Waste Toxicity Characteristic (35 IAC 721.124)	Sample Identification	B-1b (1-3')	B-1b (4-5.5')	B-2b (1-3')	B-2b (4-6')	B-3b (4-6')	B-3b (6-8')	B-36b (1-3')
				Sample Depth (feet)	(1-3')	(4-5.5')	(1-3')	(4-6')	(4-6')	(6-8')	(1-3')
				Date Collected	02/13/2018	02/13/2018	02/13/2018	02/13/2018	02/13/2018	02/13/2018	02/13/2018
		Class I	mg/L								
SPLP Inorganic Analytical Parameters											
Barium	mg/L	2.0	---		--	--	--	--	--	--	0.029
Beryllium	mg/L	0.004	---		--	< 0.0020	--	< 0.0020	--	--	--
Cadmium	mg/L	0.01	---		--	--	--	--	< 0.0020	--	--
Copper	mg/L	0.65	---		< 0.020	--	< 0.020	--	--	--	--
Manganese	mg/L	0.15	---		--	< 0.0040	--	0.026	--	--	--
Mercury	mg/L	0.00	---		< 0.00020	--	< 0.00020	--	--	--	--
Selenium	mg/L	0.05	---		--	--	--	--	< 0.0040	--	--
Zinc	mg/L	5.00	---		< 0.020	--	0.041	--	--	--	--
TCLP Inorganic Analytical Parameters											
Lead	mg/L	0.0075	5.0		--	0.033	--	0.21	--	1.1	--

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-1 (1-3)	B-1 (4-6)	B-2 (1-3)	B-2 (6-8)	B-3 (1-3)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	1' - 3'	4' - 6'	1' - 3'	6' - 8'	1' - 3'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/27/2013	6/27/2013	6/27/2013	6/27/2013	6/27/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		0.57	< 0.038	< 0.037	< 0.04	< 0.41
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.36	< 0.038	0.043	< 0.04	< 0.41
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		2.3	0.04	0.15	< 0.04	0.59
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		4.6	0.18	0.57	< 0.04	2.2
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		4.6	0.17	0.6	< 0.04	2.3
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		4.2	0.23	0.59	< 0.04	2.3
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		2.5	0.11	0.35	< 0.04	1.4
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		3.7	0.14	0.42	< 0.04	2.1
Chrysene	mg/kg	780	---	17,000	---	160	1.2		4.4	0.19	0.58	< 0.04	2.6
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		1.4	0.073	0.17	< 0.04	0.8
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		10	0.3	1.1	< 0.04	4.2
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		1.1	< 0.038	< 0.037	< 0.04	< 0.41
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		2.3	0.093	0.3	< 0.04	1.2
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		< 0.35	< 0.038	< 0.037	< 0.04	< 0.41
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		7.5	0.11	0.55	< 0.04	1.9
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		7.9	0.28	1	< 0.04	3.8
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		< 1.8	< 0.2	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		< 1.8	< 0.2	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		< 8.9	< 0.96	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		< 1.8	< 0.2	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		< 1.8	< 0.2	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		< 1.8	< 0.2	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		< 1.8	< 0.2	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		< 1.8	< 0.2	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		< 3.5	< 0.38	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		< 1.8	< 0.2	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		< 1.8	< 0.2	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		< 1.8	< 0.2	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		< 1.8	< 0.2	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		< 1.8	< 0.2	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		< 1.8	< 0.2	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-3 (4-6)	B-4 (1-3)	B-4 (4-6)	B-5 (1-3)	B-5 (4-6)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	4' - 6'	1' - 3'	4' - 6'	1' - 3'	4' - 6'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/27/2013	6/27/2013	6/27/2013	6/25/2013	6/25/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		0.073	< 0.044	< 0.04	0.43	< 0.037
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.26	< 0.044	< 0.04	0.095	< 0.037
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		0.84	< 0.044	< 0.04	1.6	0.044
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		3.3	< 0.044	0.1	3.7	0.13
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		4.3	< 0.044	0.1	3.6	0.17
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		2.3	< 0.044	0.087	3.5	0.16
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		2.4	< 0.044	0.058	2	0.12
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		2.9	< 0.044	0.1	2.7	0.12
Chrysene	mg/kg	780	---	17,000	---	160	1.2		3.8	< 0.044	0.12	3.9	0.18
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		0.78	< 0.044	< 0.04	1.1	< 0.037
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		6.1	< 0.044	0.22	9.6	0.22
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		0.15	< 0.044	< 0.04	0.53	< 0.037
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		1.7	< 0.044	0.057	1.8	0.086
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		0.087	< 0.044	< 0.04	0.38	< 0.037
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		0.52	< 0.044	0.17	6.9	0.11
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		9.1	< 0.044	0.2	7.9	0.24
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-6 (1-3)	B-6 (6-8)	B-7 (1-3)	B-7 (4-6)	B-8 (1-3)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	1' - 3'	6' - 8'	1' - 3'	4' - 6'	1' - 3'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/25/2013	6/25/2013	6/27/2013	6/27/2013	6/26/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		2	0.087	0.33	< 0.06	8.8
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.059	0.078	0.19	< 0.06	4.9
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		7.2	0.32	1.4	< 0.06	42
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		7.4	0.95	4.4	0.073	77
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		6.4	0.87	4.3	0.071	73
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		4.4	1	4.6	< 0.06	53
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		2.5	0.53	2.4	< 0.06	30
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		4.1	0.64	2.9	0.081	61
Chrysene	mg/kg	780	---	17,000	---	160	1.2		6.6	1.1	4.5	0.071	70
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		1.3	0.27	1.2	< 0.06	16
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		21	2.4	9.8	0.14	180
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		3.4	0.14	0.42	< 0.06	18
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		2.4	0.47	2.2	< 0.06	28
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		0.75	0.078	0.09	< 0.06	5.7
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		22	1.9	5.4	0.091	160
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		16	1.9	7.8	0.14	140
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-8 (4-6)	B-9 (1-3)	B-9 (4-6)	B-10 (1-3)	B-10 (4-6)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	4' - 6'	1' - 3'	4' - 6'	1' - 3'	4' - 6'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/26/2013	6/26/2013	6/26/2013	6/25/2013	6/25/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		1.9	< 0.36	1.3	0.13	0.077
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.42	< 0.36	0.76	0.067	< 0.043
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		9.7	< 0.36	3.3	0.4	0.17
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		19	0.44	6.2	0.83	0.49
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		18	1.2	5.7	0.76	0.52
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		14	0.81	5.3	0.77	0.55
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		8	1.1	2.6	0.52	0.32
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		17	0.52	4.6	0.74	0.39
Chrysene	mg/kg	780	---	17,000	---	160	1.2		18	0.6	6.2	0.86	0.59
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		4.2	0.51	1.5	0.25	0.17
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		40	0.86	15	2.2	0.96
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		3.7	< 0.36	2.7	0.32	0.065
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		7.7	0.73	2.4	0.48	0.28
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		1	< 0.36	3.1	0.3	0.15
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		32	0.43	14	1.9	0.66
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		32	0.98	12	1.7	0.93
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		< 0.22	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		< 0.22	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		< 1.1	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		< 0.22	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		< 0.22	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		2	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		< 0.22	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		< 0.22	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		< 0.44	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		< 0.22	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		< 0.22	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		2.2	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		< 0.22	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		< 0.22	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		< 0.22	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-11 (1-3)	B-11 (4-6)	B-12 (1-3)	B-12 (4-6)	B-13 (1-3)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	1' - 3'	4' - 6'	1' - 3'	4' - 6'	1' - 3'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/27/2013	6/27/2013	6/28/2013	6/28/2013	6/28/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		< 0.042	< 0.04	< 0.04	< 0.039	< 0.04
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		< 0.042	< 0.04	0.047	0.051	0.047
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		< 0.042	< 0.04	0.055	0.1	0.13
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		0.068	0.19	0.25	0.28	0.58
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		0.064	0.14	0.35	0.31	0.6
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		0.062	0.13	0.4	0.25	0.64
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		0.071	0.1	0.3	0.15	0.35
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		0.086	0.14	0.27	0.19	0.46
Chrysene	mg/kg	780	---	17,000	---	160	1.2		0.083	0.2	0.35	0.29	0.63
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		< 0.042	0.053	0.15	0.078	0.2
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		0.099	0.26	0.28	0.53	1
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		< 0.042	< 0.04	< 0.04	< 0.039	< 0.04
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		0.061	0.071	0.24	0.12	0.3
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		< 0.042	< 0.04	0.1	< 0.039	< 0.04
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		0.1	0.36	0.17	0.34	0.54
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		0.12	0.34	0.26	0.52	0.91
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	< 0.21	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	< 0.21	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	< 1	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	< 0.21	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	< 0.21	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	< 0.21	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	< 0.21	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	< 0.21	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	< 0.4	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	< 0.21	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	< 0.21	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	< 0.21	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	< 0.21	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	< 0.21	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	< 0.21	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-13 (4-6)	B-14 (1-3)	B-14 (6-8)	B-14VD (8-10)	B-15 (1-3)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	4' - 6'	1' - 3'	6' - 8'	8' - 10'	1' - 3'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/28/2013	6/27/2013	6/27/2013	9/26/2013	6/27/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		< 0.042	< 0.036	67	0.22	0.72
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		< 0.042	< 0.036	39	0.088	0.41
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		0.05	0.1	160	0.55	1.7
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		0.11	0.42	200	0.83	7.1
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		0.13	0.46	190	0.79	8.4
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		0.13	0.44	160	0.63	8.7
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		0.097	0.26	85	0.5	5.3
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		0.085	0.33	140	0.62	6.1
Chrysene	mg/kg	780	---	17,000	---	160	1.2		0.14	0.45	200	0.85	8.5
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		< 0.042	0.14	44	0.26	2.4
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		0.17	0.83	480	1.8	19
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		< 0.042	< 0.036	140	0.35	0.71
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		0.087	0.24	79	0.45	4.4
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		< 0.042	< 0.036	170	0.51	< 0.37
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		0.13	0.36	600	2.1	9.1
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		0.2	0.84	420	1.6	15
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-15 (4-6)	B-16 (1-3)	B-16 (4-6)	B-17 (1-3)	B-17 (4-6)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	4' - 6'	1' - 3'	4' - 6'	1' - 3'	4' - 6'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/27/2013	6/27/2013	6/27/2013	6/26/2013	6/26/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		0.35	< 0.038	< 0.044	< 0.41	< 0.053
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		< 0.037	< 0.038	< 0.044	< 0.41	< 0.053
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		0.088	0.072	< 0.044	< 0.41	< 0.053
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		0.22	0.13	< 0.044	0.89	0.058
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		0.21	0.11	< 0.044	0.92	0.062
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		0.23	0.09	< 0.044	0.68	0.067
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		0.11	0.062	< 0.044	0.45	< 0.053
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		0.16	0.096	< 0.044	0.47	< 0.053
Chrysene	mg/kg	780	---	17,000	---	160	1.2		0.25	0.12	< 0.044	0.86	0.081
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		0.069	< 0.038	< 0.044	< 0.41	< 0.053
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		0.62	0.24	0.047	1.8	0.11
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		0.061	< 0.038	< 0.044	< 0.41	< 0.053
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		0.095	0.044	< 0.044	0.42	< 0.053
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		< 0.037	< 0.038	< 0.044	< 0.41	< 0.053
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		0.32	0.2	< 0.044	0.82	0.084
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		0.47	0.22	< 0.044	1.4	0.11
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	< 0.2	< 0.23	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	< 0.2	< 0.23	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	< 0.96	< 1.1	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	< 0.2	< 0.23	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	< 0.2	< 0.23	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	< 0.2	< 0.23	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	< 0.2	< 0.23	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	< 0.2	< 0.23	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	< 0.38	< 0.44	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	< 0.2	< 0.23	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	< 0.2	< 0.23	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	< 0.2	< 0.23	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	< 0.2	< 0.23	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	< 0.2	< 0.23	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	< 0.2	< 0.23	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-18 (1-3)	B-18 (4-6)	B-19 (1-3)	B-19 (4-6)	B-20 (1-3)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	1' - 3'	4' - 6'	1' - 3'	4' - 6'	1' - 3'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/26/2013	6/26/2013	6/26/2013	6/26/2013	6/27/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		< 0.37	< 0.043	0.22	< 0.047	< 0.041
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.86	< 0.043	0.16	< 0.047	< 0.041
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		2.4	< 0.043	0.63	< 0.047	0.41
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		8.2	< 0.043	1.8	0.049	2.5
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		8.7	< 0.043	1.9	0.054	1.8
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		8.9	< 0.043	1.7	< 0.047	2.2
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		4.4	< 0.043	0.9	< 0.047	1
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		6.2	< 0.043	1.5	< 0.047	1.4
Chrysene	mg/kg	780	---	17,000	---	160	1.2		7.7	< 0.043	1.9	0.064	2.8
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		2.2	< 0.043	0.5	< 0.047	0.59
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		18	0.044	3.7	0.11	3.8
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		0.55	< 0.043	0.15	< 0.047	< 0.041
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		4.2	< 0.043	0.83	< 0.047	0.93
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		< 0.37	< 0.043	0.09	< 0.047	< 0.041
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		6.5	0.049	1.6	0.094	1.5
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		16	0.054	3.3	0.11	3.7
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	< 0.21
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	< 0.21
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	< 1
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	< 0.21
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	< 0.21
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	< 0.21
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	< 0.21
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	< 0.21
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	< 0.41
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	< 0.21
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	< 0.21
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	< 0.21
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	< 0.21
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	< 0.21
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	< 0.21

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-20 (4-6)	B-21 (1-3)	B-21 (4-6)	B-24 (1-3)	B-24 (6-8)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	4' - 6'	1' - 3'	4' - 6'	1' - 3'	6' - 8'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/27/2013	6/27/2013	6/27/2013	6/27/2013	6/27/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		< 0.048	< 0.043	< 0.041	< 0.36	< 0.052
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		< 0.048	< 0.043	< 0.041	< 0.36	< 0.052
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		< 0.048	< 0.043	< 0.041	< 0.36	< 0.052
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		0.13	< 0.043	< 0.041	0.37	< 0.052
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		0.14	< 0.043	< 0.041	0.44	< 0.052
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		0.075	< 0.043	< 0.041	0.41	< 0.052
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		0.09	< 0.043	< 0.041	< 0.36	< 0.052
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		0.12	< 0.043	< 0.041	< 0.36	< 0.052
Chrysene	mg/kg	780	---	17,000	---	160	1.2		0.17	< 0.043	< 0.041	0.44	< 0.052
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		< 0.048	< 0.043	< 0.041	< 0.36	< 0.052
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		0.18	0.05	< 0.041	0.71	0.068
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		< 0.048	< 0.043	< 0.041	< 0.36	< 0.052
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		0.053	< 0.043	< 0.041	< 0.36	< 0.052
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		< 0.048	< 0.043	< 0.041	< 0.36	< 0.052
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		0.11	0.12	< 0.041	< 0.36	0.07
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		0.29	0.044	< 0.041	0.68	0.079
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-25 (1-3)	B-25 (4-6)	B-26 (1-3)	B-26 (6-8)	B-27 (1-3)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	1' - 3'	4' - 6'	1' - 3'	6' - 8'	1' - 3'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/26/2013	6/26/2013	6/26/2013	6/26/2013	6/26/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		0.17	0.46	6.2	< 0.04	0.94
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.21	0.2	< 0.39	< 0.04	0.52
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		0.99	1.4	20	< 0.04	3.7
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		2.7	2.3	29	< 0.04	8.7
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		2.7	2	22	< 0.04	8.1
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		2.3	2.1	22	< 0.04	8
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		1.4	0.94	10	< 0.04	4.1
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		2.1	1.4	19	< 0.04	6.4
Chrysene	mg/kg	780	---	17,000	---	160	1.2		2.6	2.3	31	< 0.04	8.8
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		0.65	0.54	6.4	< 0.04	2.3
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		6.1	5.3	70	< 0.04	20
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		0.29	1.4	11	< 0.04	1.4
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		1.2	0.86	9.5	< 0.04	3.9
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		0.06	1.2	5.5	< 0.04	0.12
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		3.1	5.7	76	< 0.04	11
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		4.9	4.3	53	< 0.04	16
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-27 (6-8)	B-28 (1-3)	B-28 (4-6)	B-29 (1-3)	B-29 (4-6)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	6' - 8'	1' - 3'	4' - 6'	1' - 3'	4' - 6'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/26/2013	6/28/2013	6/28/2013	6/28/2013	6/28/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		0.13	< 0.039	< 0.038	0.18	< 0.039
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.055	0.073	< 0.038	0.11	< 0.039
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		0.24	0.21	< 0.038	0.68	< 0.039
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		0.79	0.68	< 0.038	1.7	0.048
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		0.89	0.62	< 0.038	1.7	< 0.039
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		1	0.67	< 0.038	1.6	< 0.039
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		0.65	0.41	< 0.038	0.96	< 0.039
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		0.67	0.44	< 0.038	1.2	< 0.039
Chrysene	mg/kg	780	---	17,000	---	160	1.2		1.1	0.67	< 0.038	1.7	0.045
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		0.31	0.2	< 0.038	0.5	< 0.039
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		1.6	1.3	< 0.038	3.2	0.09
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		0.13	0.041	< 0.038	0.23	< 0.039
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		0.49	0.34	< 0.038	0.86	< 0.039
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		0.24	< 0.039	< 0.038	0.062	< 0.039
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		1.3	0.61	< 0.038	2.1	0.092
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		1.7	1.1	< 0.038	2.8	0.075
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-30 (1-3)	B-30 (4-6)	B-31 (1-3)	B-31 (6-8)	B-32 (1-3)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	1' - 3'	4' - 6'	1' - 3'	6' - 8'	1' - 3'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/28/2013	6/28/2013	6/27/2013	6/27/2013	6/26/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		< 0.042	0.053	0.28	< 0.045	0.1
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		< 0.042	< 0.042	0.24	< 0.045	0.19
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		< 0.042	0.18	1.1	< 0.045	0.51
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		< 0.042	0.36	2.8	< 0.045	1.8
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		< 0.042	0.38	2.8	< 0.045	2.1
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		< 0.042	0.34	2.4	< 0.045	2
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		< 0.042	0.2	1.6	< 0.045	1.2
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		< 0.042	0.25	2.3	< 0.045	1.6
Chrysene	mg/kg	780	---	17,000	---	160	1.2		< 0.042	0.35	2.9	< 0.045	2
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		< 0.042	0.11	0.76	< 0.045	0.57
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		< 0.042	0.8	6.1	0.061	3.8
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		< 0.042	0.057	0.36	< 0.045	0.12
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		< 0.042	0.15	1.4	< 0.045	1.1
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		< 0.042	< 0.042	0.078	< 0.045	0.095
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		< 0.042	0.52	4.1	0.053	1.8
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		< 0.042	0.85	5.3	0.047	3.5
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-32 (6-8)	B-33 (1-3)	B-33 (4-6)	B-34 (1-3)	B-34 (4-6)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	6' - 8'	1' - 3'	4' - 6'	1' - 3'	4' - 6'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/26/2013	6/26/2013	6/26/2013	6/25/2013	6/25/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		< 0.058	0.071	0.069	0.37	< 0.043
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		< 0.058	0.061	0.14	0.16	< 0.043
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		< 0.058	0.31	0.5	1.2	0.043
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		< 0.058	0.79	1.6	2.7	0.1
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		< 0.058	0.76	1.4	2.5	0.098
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		< 0.058	0.72	1.3	2.1	0.073
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		< 0.058	0.45	0.77	1.2	0.051
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		< 0.058	0.62	1.1	2.2	0.08
Chrysene	mg/kg	780	---	17,000	---	160	1.2		< 0.058	0.8	1.5	2.9	0.14
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		< 0.058	0.24	0.38	0.66	< 0.043
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		< 0.058	1.8	3.5	7.5	0.2
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		< 0.058	0.13	0.16	0.42	< 0.043
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		< 0.058	0.39	0.69	1.1	< 0.043
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		< 0.058	0.049	< 0.041	0.28	< 0.043
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		< 0.058	1.1	1.6	4.5	0.22
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		< 0.058	1.5	2.9	6.5	0.26
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	< 0.2	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	< 0.2	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	< 1	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	< 0.2	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	< 0.2	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	0.31	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	< 0.2	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	< 0.2	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	< 0.4	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	< 0.2	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	< 0.2	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	< 0.2	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	< 0.2	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	< 0.2	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	< 0.2	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-35 (1-3)	B-35 (4-6)	B-36 (1-3)	B-36 (4-6)	B-37 (1-3)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	1' - 3'	4' - 6'	1' - 3'	4' - 6'	1' - 3'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/26/2013	6/26/2013	6/26/2013	6/26/2013	6/27/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		5.6	17	0.05	0.075	0.73
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		1.2	2.2	0.05	0.092	0.43
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		15	42	0.12	0.22	2.3
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		23	72	0.63	0.6	6
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		21	67	0.79	0.55	5.9
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		17	57	0.79	0.59	6
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		9.8	32	0.51	0.27	3.1
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		18	52	0.84	0.34	4.7
Chrysene	mg/kg	780	---	17,000	---	160	1.2		23	77	0.83	0.67	6.4
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		5.5	16	0.25	0.15	1.6
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		48	180	1.3	1.4	13
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		8.7	20	0.039	0.14	1
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		7.7	28	0.42	0.23	2.8
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		8.1	2.9	< 0.037	0.047	0.54
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		46	160	0.5	1.2	8.9
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		42	160	1.1	1.3	11
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-37 (6-8)	B-101 (6-8)	B-103 (6-8)	B-104 (6-8)	B-105 (6-8)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	6' - 8'	6' - 8'	6' - 8'	6' - 8'	6' - 8'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	6/27/2013	9/27/2013	9/27/2013	9/27/2013	9/27/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		0.34	0.4	190	84	33
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.094	0.056	65	48	18
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		0.87	0.72	380	220	76
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		1.7	1.5	560	300	130
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		1.6	1.5	500	300	120
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		1.1	1.2	470	250	96
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		0.8	0.99	350	160	73
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		1.1	1.2	420	230	91
Chrysene	mg/kg	780	---	17,000	---	160	1.2		1.8	1.6	570	290	130
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		0.39	0.47	170	81	39
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		3	3	1300	550	300
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		0.38	0.48	280	170	51
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		0.65	0.88	320	140	66
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		0.12	1	510	250	54
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		4.1	3	1300	680	300
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		4.1	2.8	1200	480	260
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-107 (6-8)	B-122 (1-3)	B-123 (1-3)	B-124 (1-3)	B-124 (4-6)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	6' - 8'	1' - 3'	1' - 3'	1' - 3'	4' - 6'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	9/27/2013	9/26/2013	9/26/2013	9/27/2013	9/27/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		< 0.044	< 0.37	< 0.042	0.054	< 0.038
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.07	< 0.37	< 0.042	< 0.041	0.039
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		0.1	0.45	0.12	0.1	0.058
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		0.5	1.3	0.54	0.2	0.26
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		0.64	1.5	0.47	0.2	0.28
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		0.46	1.2	0.54	0.17	0.21
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		0.47	1.2	0.38	0.13	0.21
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		0.45	0.91	0.37	0.15	0.21
Chrysene	mg/kg	780	---	17,000	---	160	1.2		0.52	1.4	0.56	0.22	0.25
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		0.19	0.57	0.21	0.072	0.095
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		0.89	2.1	0.95	0.42	0.5
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		< 0.044	< 0.37	< 0.042	0.049	< 0.038
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		0.37	0.95	0.37	0.11	0.18
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		< 0.044	< 0.37	< 0.042	0.082	< 0.038
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		0.28	1.2	0.53	0.43	0.2
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		1	2	0.79	0.41	0.48
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-125 (1-3)	B-125 (4-6)	B-126 (1-3)	B-126 (4-6)	B-127 (1-3)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	1' - 3'	4' - 6'	1' - 3'	4' - 6'	1' - 3'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	9/27/2013	9/27/2013	9/27/2013	9/27/2013	9/27/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		0.23	< 0.044	< 0.04	< 0.043	1.2
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.08	< 0.044	< 0.04	< 0.043	< 0.36
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		0.62	< 0.044	< 0.04	< 0.043	2.7
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		2.3	< 0.044	< 0.04	< 0.043	12
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		2.4	< 0.044	< 0.04	< 0.043	11
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		2.4	< 0.044	< 0.04	< 0.043	13
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		1.6	< 0.044	< 0.04	< 0.043	7.2
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		1.9	< 0.044	< 0.04	< 0.043	9.3
Chrysene	mg/kg	780	---	17,000	---	160	1.2		2.5	< 0.044	< 0.04	0.044	14
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		0.8	< 0.044	< 0.04	< 0.043	3.9
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		4.2	< 0.044	< 0.04	0.055	28
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		0.23	< 0.044	< 0.04	< 0.043	0.94
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		1.5	< 0.044	< 0.04	< 0.043	6.8
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		0.093	< 0.044	< 0.04	< 0.043	< 0.36
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		2.6	< 0.044	< 0.04	0.045	14
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		4.1	< 0.044	< 0.04	0.079	22
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-128 (1-3)	B-129 (1-3)	B-130 (1-3)	B-130 (4-6)	B-131 (1-3)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	1' - 3'	1' - 3'	1' - 3'	4' - 6'	1' - 3'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	9/27/2013	9/27/2013	9/27/2013	9/27/2013	9/27/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		0.26	0.14	1.1	< 0.041	1.1
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.13	0.062	0.78	< 0.041	1.2
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		1.2	0.52	5.3	0.23	4.9
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		3.7	2.2	14	0.94	14
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		3.5	2.3	12	0.91	12
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		3.1	2.4	9.4	0.51	8
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		2.4	1.6	7.2	0.46	7.4
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		3.1	1.8	9.5	0.56	9.2
Chrysene	mg/kg	780	---	17,000	---	160	1.2		3.9	2.4	15	0.84	15
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		1.3	0.79	3.6	0.21	3.5
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		7.1	4.1	29	1.4	26
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		0.34	0.14	1.5	< 0.041	1.8
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		2.2	1.5	6.5	0.32	6.2
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		0.13	< 0.041	0.24	< 0.041	0.26
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		4.6	1.9	19	0.21	22
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		5.8	3.7	30	2.5	33
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-131 (4-6)	B-132 (1-3)	B-132 (4-6)	B-133 (1-3)	B-133 (4-6)
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	4' - 6'	1' - 3'	4' - 6'	1' - 3'	4' - 6'
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	9/27/2013	9/27/2013	9/27/2013	9/27/2013	9/27/2013
Semivolatile Organic Analytical Parameters													
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		0.078	1	0.29	6.2	< 0.05
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.11	0.51	0.15	4.2	< 0.05
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		0.4	3.8	0.97	18	0.052
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		1.1	11	3.6	39	0.12
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		1.2	9.7	3.2	36	0.12
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		1	7.8	2.2	30	0.092
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		0.77	6.1	2	22	0.089
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		1	7.5	2.6	31	0.093
Chrysene	mg/kg	780	---	17,000	---	160	1.2		1.1	12	3.7	42	0.13
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		0.39	3.3	0.98	12	< 0.05
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		2.3	22	6.1	86	0.25
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		0.19	1.2	0.35	9.7	< 0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		0.67	5.5	1.6	20	0.054
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		< 0.048	0.62	0.17	5.4	< 0.05
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		1.4	12	3.4	79	0.2
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		2	21	7.4	76	0.26
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table 2 - Terracon Soil Analytical Results - SVOCs
650 West 83rd Street, Chicago, IL
Project Number:A2157000

Analyte	Units	IEPA Tier 1 Soil Remediation Objectives					Background	Sample Identification	B-207 (6-8')	B-208 (6-8')	B-209 (6-8')
		Industrial/Commercial Properties		Construction Workers		Soil Component of the Groundwater Ingestion Route		Sample Depth (feet)	(6-8')	(6-8')	(6-8')
		Ingestion	Inhalation	Ingestion	Inhalation	Class I	Chicago	Date Collected	02/20/2015	02/20/2015	02/20/2015
Semivolatile Organic Analytical Parameters											
Acenaphthene	mg/kg	120,000	---	120,000	---	570	0.09		0.42	9.0	0.11
Acenaphthylene	mg/kg	61,000	---	61,000	---	85	0.03		0.21	6.3	0.11
Anthracene	mg/kg	610,000	---	610,000	---	12,000	0.25		1.4	26	0.20
Benzo(a)anthracene	mg/kg	8.0	---	170	---	2.0	1.1		3.3	34	0.56
Benzo(a)pyrene	mg/kg	0.8	---	17	---	8.0	1.3		2.8	30	0.53
Benzo(b)fluoranthene	mg/kg	8.0	---	170	---	5.0	1.5		2.1	25	0.61
Benzo(g,h,i)perylene	mg/kg	61,000	---	61,000	---	27,000	0.68		1.8	14	0.36
Benzo(k)fluoranthene	mg/kg	78	---	1,700	---	49	0.99		2.0	25	0.37
Chrysene	mg/kg	780	---	17,000	---	160	1.2		3.6	31	0.70
Dibenzo(a,h)anthracene	mg/kg	0.8	---	17	---	2.0	0.2		0.90	8.4	0.19
Fluoranthene	mg/kg	82,000	---	82,000	---	4,300	2.7		6.1	70	1.2
Fluorene	mg/kg	82,000	---	82,000	---	560	0.1		0.56	20	0.078
Indeno(1,2,3-c,d)pyrene	mg/kg	8	---	170	---	14	0.86		1.4	14	0.28
Naphthalene	mg/kg	41,000	270	4,100	1.8	12	0.04		0.26	32	< 0.046
Phenanthrene	mg/kg	61,000	---	61,000	---	200	1.3		5.0	88	0.80
Pyrene	mg/kg	61,000	---	61,000	---	4,200	1.9		7.2	57	1.2
bis(2-Chloroethoxy) methane	mg/kg	---	---	---	---	---	---		--	--	--
bis(2-Chloroethyl) ether	mg/kg	5.0	*0.66*	75	*0.66*	*0.66*	---		--	--	--
bis(2-Ethylhexyl)phthalate	mg/kg	410	31,000	4,100	31,000	3,600	---		--	--	--
4-Bromophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--
Butylbenzylphthalate	mg/kg	410,000	930	410,000	930	930	---		--	--	--
Carbazole	mg/kg	290	---	6,200	---	0.6	---		--	--	--
4-Chloroaniline	mg/kg	8,200	---	820	---	0.7	---		--	--	--
2-Chloronaphthalene	mg/kg	160,000	---	160,000	---	49	---		--	--	--
4-Chloro-3-methylphenol	mg/kg	14,000	---	41,000	---	24	---		--	--	--
2-Chlorophenol	mg/kg	10,000	53,000	10,000	53,000	4.0	---		--	--	--
4-Chlorophenyl-phenyl ether	mg/kg	---	---	---	---	---	---		--	--	--
Dibenzofuran	mg/kg	4,100	---	4,100	---	6.1	---		--	--	--
1,2-Dichlorobenzene	mg/kg	180,000	560	18,000	310	17	---		--	--	--
1,3-Dichlorobenzene	mg/kg	1,800	570	180	570	0.2	---		--	--	--
1,4-Dichlorobenzene	mg/kg	---	17,000	---	340	2.0	---		--	--	--

Tier 2 SRO for the Industrial/Commercial Ingestion Exposure Route - Benzo(a)pyrene: 5.72 mg/kg

= Sample removed as industrial/commercial ingestion exceedance with Tier 2 SRO

Table Notes

Remediation Objectives from 35 Illinois Administrative Code Chapter 742: *Tiered Approach to Corrective Action Objectives* (TACO).

Remediation Objectives for Non-TACO compounds from Illinois Environmental Protection Agency's (IEPA's) web site (http://www.epa.state.il.us/land/taco/chemicals-not-in-taco-tier-1-tables.html).

mg/L = milligrams per liter, generally equivalent to parts per million (ppm)

mg/kg = milligrams per kilogram, generally equivalent to ppm

mg/m3 = milligrams per cubic meter

TCLP = Toxicity Characteristic Leaching Procedure

SPLP = Synthetic Precipitation Leaching Procedure

-- = Sample not analyzed for this constituent

--- = No IEPA Remediation Objective for this exposure route.

Bold = Inorganic analyte concentrations above background concentrations.

* In pH-specific table, hexavalent chromium used as RO for total chromium to allow for a conservative comparison.

** To adequately characterize the pH of the soil on site, 15 samples were selected throughout the entire site area and at each subsurface interval. Inorganic pH-specific analyses for samples with no laboratory pH value were evaluated using the nearest sample pH from the same subsurface interval.

= Highlighted cell indicates exceedance of Tier 1 Remedial Objective value. Background considered SRO value for many PNA constituents. Italicized Tier 1 ROs were changed to laboratory Accepted Detection Limits (ADL) per 35 IAC 742.510 a) 8.

Calcium, magnesium, sodium and potassium were detected over background in soil samples, but are considered nutrients in soil and do not require further consideration.

Terracon

Appendix A
IEPA DRM-1 and DRM-2 Forms

Illinois Environmental Protection Agency

Bureau of Land • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Site Remediation Program (SRP)
Application and Services Agreement (DRM-1) Form

For Illinois EPA Use:
Log No. _____
____ $500 Advance Partial Payment Included
____ DRM-2 SRP Form Included
____ DR-3 Request for Assessment Included

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Remedial Project Management Section at the above address.

I. Site Identification:

Site Name: Proposed Anaerobic Digester Facility County: Cook
Street Address: 650 W. 83rd Street P.O. Box: _____
City: Chicago State: IL Zip Code: 60620 Approx. site size (acres) 9
Illinois Inventory ID Number: 0316715228 USEPA ID Number _____
Site Base Map Attached: ☑ Yes ☐ No Illinois EPA Permit(s): _____
LUST/IEMA Incident Number(s), if applicable: _____

II. Remediation Applicant ("RA"):

RA's Name: Mr./Ms. Mr. Jason Feldman Title: Director
Company: Green Era Educational NFP
Street Address: 218 N. Jefferson Street, STE. 300 P.O. Box: _____
City: Chicago State: IL Zip Code: 60661 Phone: (312) 544-9218
FEIN or SSN: 46-2580661

I hereby certify that I am authorized to sign this application and services agreement. I certify that the proposed project meets the eligibility criteria set forth in Section 58.1(a)(2) of the Environmental Protection Act (415 ILCS 5/58.1(1)(2)) and regulations promulgated thereunder and that this submittal and all attachments were prepared at my direction. In consideration for the Illinois EPA's agreement to provide (subject to applicable law, available resources, and receipt of the advance partial payment) review and evaluation services for activities carried out pursuant to Title 17 of the Illinois Environmental Protection Act (415 ILCS 5/58-58.12), I agree to:

(1) Conform with the procedures of Title 17 of the Illinois Environmental Protection Act (415 ILCS 5/58 - 58.12) and implementing regulations;

(2) Allow for or otherwise arrange site visits or other site evaluations by the Illinois EPA when requested;

(3) Pay any reasonable costs incurred and documented by the Illinois EPA in providing such services; and

(4) Make an advance partial payment to the Illinois EPA for such anticipated services provided in Section V of this application.

As the RA, I understand that I may terminate this services agreement at any time, by notifying the Illinois EPA in writing that services previously requested under the services agreement are no longer wanted. Within 180 days of receipt of the notice, the Illinois EPA shall provide me with a final invoice for services provided until the date of receipt of such notification.

To the best of my knowledge and belief, this request and all attachments are true, accurate and complete. I hereby certify that I have the authority to enter into this agreement.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent conviction is a Class 3 felony. (415 ILCS 5/44(h)).

_____ 12-18-19
RA's Signature: Date:

***In addition to the fees applicable under this Services Agreement, the recipient of a No Further Remediation (NFR) Letter must pay to the Illinois EPA an NFR Assessment in the amount of the lesser of $2500 or an amount equal to the costs incurred by the Illinois EPA under this Agreement (35 IAC 740.615)**

III. Project Objectives:

A. Release Letter Requested.

Please complete one of the subsections by checking applicable boxes and including other information (if necessary, additonal information may be attached to this application form):

☑ Comprehensive No Further Remediation ("NFR") Letter

☐ Focused NFR Letter
Identify the focused contaminants of concern by checking the applicable box(es):

☐ Volatiles ☐ BTEX ☐ PCBs ☐ Metals ☐ Semivolatiles ☑ PNAs
☐ Pesticides ☐ Other (identify) _____

☐ 4(y) Letter
Identify the focused contaminants of concern by checking the applicable box(es):

☐ Volatiles ☐ BTEX ☐ PCBs ☐ Metals ☐ Semivolatiles ☐ PNAs
☐ Pesticides ☐ Other (identify) _____

Identify the media of concern by checking the applicable box(es):

☐ Soil ☐ Sediments ☐ Other: _____

Identify the actions (e.g. drum removal, spill response, etc.):

_____

B. Identify any support services being sought from the Illinois EPA in addition to the review and evaluation services. If necessary, additional information may be attached to this application form.

☑ No additional support services are being sought
☐ Assistance with community relations
☐ Sample collection and analyses
☐ Other (identify): _____

C. Anticipated Schedule

SRP Document	Projected Date of Receipt by Illinois EPA
Site Investigation Report	May 29, 2015
Remediation Objectives Report	May 29, 2015
Remedial Action Plan	January 2020
Remedial Action Completion Report	September 2021

D. Identify the current and post-remedation uses of the remediation site. If necessary, additional information may be attached to this application form.

Current Use:

Vacant Site

Post-Remediation Use:

Anaerobic Digester and Ancillary Features

IV. Written Permission from the Property Owner (check one of the applicable boxes and provide additional information):

☑ RA is the property owner of the remediation site identified in Section 1 of this application

☐ RA is **not** the property owner of the remediation site identified in Section 1 of this application

Property Owner's Name: Mr./Ms. _____ _____ Title: _____

Company: _____

Street Address: _____ P.O. Box: _____

City: _____ State: _____ Zip Code: _____ Phone: _____

I hereby certify that the RA has my permission to enroll the site identified in Section 1 of this application into the Illinois EPA Site Remediation Program. I certify that the RA and designated representatives have permission to enter the indicated premises for the pupose of conducting remedial investigations or activities.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent conviction is a Class 3 felony. (415 ILCS 5/44(h)).

_____ _____

Owner's Signature: Date:

For multiple property owners, attach additional sheets containing all the information above along with a signed, dated certification for each.

V. Advance Partial Payment:

The RA shall select one of the following advance partial payment plans:

☑ Plan 1: A $500 advance partial payment is included with this application. Please make the check payable to: Illinois Environmental Protection Agency". Please include "For Deposit in the Hazardous Waste Fund" and the Remedation Applicant's FEIN or SSN on the check; or

☐ Plan 2: Request that the Illinois EPA determine the appropriate partial payment (i.e., approximately one-half of the total anticipated costs of the Illinois EPA, not to exceed $5,000). A completed DRM-3 form ("Request for Assessment of Advance Partial Payment for Anticipated Services") must accompany this application so that the Illinois EPA may determine the appropriate advance partial payment specific to the services requested.

If this application contains plans and reports for review and evaluation by the Illinois EPA, a completed DRM-2 Form must also accompany this submittal.

Illinois Environmental Protection Agency

Bureau of Land • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Site Remediation Program Form (DRM-2)
(To be Submitted with all Plans and Reports)

You may complete this form online, save a copy, print, sign and mail it to the address above.

I. Site Identification:

Site Name: Proposed Anaerobic Digester Facility

Street Address: 650 W. 83rd Street P.O. Box: _____

City: Chicago State: IL Zip Code: 60620 Phone: _____

Illinois Inventory ID Number: 0316715228 IEMA Incident Number: _____

II. Remediation Applicant:

Applicant's Name: Mr./Ms. Mr. Jason Feldman

Company: Green Era Educational NFP

Street Address: 218 N. Jefferson Street, STE. 300 P.O. Box: _____

City: Chicago State: IL Zip Code: 60661 Phone: (312) 544-9218

Email Address: jason@greenerapartners.com

I hereby request that the Illinois EPA review and evaluate the attached project documents in accordance with the terms and conditions of the Environmental Protection Act (415 ILCS 5), implementing regulations, and the review and evaluation services agreement.

Remediation Applicant's Signature: _____ Date: 12-18-19

III. Contact Person for Remediation Applicant:

Contact's Name: Mr./Ms. Mr. Jason Feldman

Company: Green Era Educational NFP

Street Address: 218 N. Jefferson Street, STE. 300 P.O. Box: _____

City: Chicago State: IL Zip Code: 60661 Phone: (312) 544-9218

Email Address: jason@greenerapartners.com

Contact Person for Consultant:

Contact's Name: Mr./Ms. Mr. Richard O'Brien, P.E.

Company: Terracon Consultants, Inc.

Street Address: 650 W. Lake Street, STE. 420 P.O. Box: _____

City: Chicago State: IL Zip Code: 60661 Phone: (312) 575-0014

Email Address: rmobrien@terracon.com

IV. Review & Evaluation Licensed Professional Engineer or Geologist ("RELPEG"), if applicable:

RELPEG's Name: Mr./Ms. _____

Company: _____

Street Address: _____ P.O. Box: _____

City: _____ State: _____ Zip Code: _____ Phone: _____

Email Address: _____

V. Project Documents Being Submitted:

Document Title: Remedial Action Plan Addendum
Prepared by: Terracon Consultants, Inc.
Date of Preparation of Plan or Report: January 2020
Prepared For: Green Era Educational NFP

Type of Document Submitted:

- ☐ Site Investigation Report - Comprehensive
- ☐ Site Investigation Report - Focused
- ☐ Remediation Objectives Report - Tier 1 or 2
- ☐ Remediation Objectives Report - Tier 3
- ☑ Remedial Action Plan
- ☐ Remedial Action Completion Report
- ☐ Sampling Plan
- ☐ Health and Safety Plan
- ☐ Community Relations Plan
- ☐ Risk Assessment
- ☐ Containment Fate & Transport Modeling
- ☐ Other: _____

Document Title: _____
Prepared by: _____
Date of Preparation of Plan or Report: _____
Prepared For: _____

Type of Document Submitted:

- ☐ Site Investigation Report - Comprehensive
- ☐ Site Investigation Report - Focused
- ☐ Remediation Objectives Report - Tier 1 or 2
- ☐ Remediation Objectives Report - Tier 3
- ☐ Remedial Action Plan
- ☐ Remedial Action Completion Report
- ☐ Sampling Plan
- ☐ Health and Safety Plan
- ☐ Community Relations Plan
- ☐ Risk Assessment
- ☐ Containment Fate & Transport Modeling
- ☐ Other: _____

Document Title: _____
Prepared by: _____
Date of Preparation of Plan or Report: _____
Prepared For: _____

Type of Document Submitted:

- ☐ Site Investigation Report - Comprehensive
- ☐ Site Investigation Report - Focused
- ☐ Remediation Objectives Report - Tier 1 or 2
- ☐ Remediation Objectives Report - Tier 3
- ☐ Remedial Action Plan
- ☐ Remedial Action Completion Report
- ☐ Sampling Plan
- ☐ Health and Safety Plan
- ☐ Community Relations Plan
- ☐ Risk Assessment
- ☐ Containment Fate & Transport Modeling
- ☐ Other: _____

VI. Professional Engineer's or Geologist's Seal or Stamp:

I attest that all site investigations or remedial activities that are subject of this plan(s) or report(s) were performed under my direction, and this document and all attachments were prepared under my direction or reviewed by me, and to the best of my knowledge and belief, the work described in the plan and report has been designed or completed in accordance with the Illinois Environmental Protection Act (415 ILCS 5), 35 Ill. Adm. Code 740, and generally accepted engineering practices or principles of professional geology, and the information presented is accurate and complete.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 Felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Engineer's or Geologist's Name: Richard O'Brien, P.E.

Company: Terracon Consultants, Inc.

Registration Number: 062.059997 Phone: 312.575.0014

License Expiration Date: 11/30/2021

Signature: [signature] Date: 1/21/2020

Professional Engineer's or Geologist's Seal or Stamp:

Note: The authority of a Licensed Professional Geologist to certify documents submitted to the Illinois Environmental Protection Agency for review and evaluation pursuant to Title XVII of the Environmental Protection Act is limited to Site Investigation Reports (415 ILCS 58.7(f), as amended by P.A. 92-0735, effective July 25, 2002. A Licensed Professional Geologist cannot certify Remediation Objectives Reports, Remedial Action Plans or Remedial Action Completion Reports.

All information submitted is available to the public except when specifically designated by the Remediation Applicant to be treated confidentially as a trade secret or secret process in accordance with the Illinois Compiled Statutes, Section 7(a) of the Environmental Protection Act, applicable Rules and Regulations of the Illinois Pollution Control Board and applicable Illinois EPA rules and guidelines. The Illinois EPA is authorized to require this information under Sections 415 ILCS 5/58 - 58.12 of the Environmental Protection Act and regulations proumulgated thereunder. Disclosure of this information is required as a condition of participation in the Site Remediation Program. Failure to do so may prevent this form from being processed and could result in your plan(s) or report(s) being rejected. This form has been approved by the Forms Management Center.

Terracon

Appendix B
Boring Logs (2018)

BORING LOG NO. B-1b

PROJECT: Proposed Aerobic Digester

CLIENT: Green Era NFP

SITE: 650 West 83rd Street
Chicago, Illinois

LOCATION See Exhibit 2

GRAPHIC LOG	DEPTH	MATERIAL DESCRIPTION	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	OVA/PID (ppm)	SAMPLE	SAMPLE SENT TO LAB (ID NUMBER)
		FILL - SILTY CLAY, Trace of gravel w/ glass and asphalt, brown							
	3.0					48	*ND	1	B-1b(1-3')
	3.5	**FILL - SILTY CLAY**, trace red brick fragments, brown							
	4.0	**FILL - SILTY SAND**, trace of gravel, brown							
		SILTY CLAY (CL), trace sand and gravel, brown, moist	5			17	*ND	2	B-1b(4-5.5')
	5.5	***Boring Refusal at 5.5 Feet***							

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

* ND indicates a reading of less than the field detection limit (FDL) of one (1) part per million isobutylene equivalents (ppmi).

Advancement Method:
Direct push

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

Notes:
Assistant Scientist: Juan Robles

WATER LEVEL OBSERVATIONS

None while drilling

None at completion

Terracon
135 Ambassador Dr
Naperville, IL

Boring Started: 02-13-2018 | Boring Completed: 02-13-2018

Drill Rig: GEOPROBE | Driller: Envirodynamics

Project No.: A2177092

BORING LOG NO. B-2b

PROJECT: Proposed Aerobic Digester

CLIENT: Green Era NFP

**SITE: 650 West 83rd Street
Chicago, Illinois**

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	OVA/PID (ppm)	SAMPLE	SAMPLE SENT TO LAB (ID NUMBER)
	FILL - SILTY CLAY, Silty clay with trace of gravel, brown					*ND		B-2b(1-3')
2.0								
2.5	**FILL - SILTY CLAY**, crushed red brick, with sand, brown				48		1	
3.0	**SANDY SILT**, trace of gravel, brown					*ND		
4.0	**SILTY CLAY**, medium gravel, brown							
	SILTY SAND, trace of gravel, brown, wet	5				*ND		
6.0					48		2	B-2b(4-6')
7.0	**SILTY SAND**, crushed brick, red, wet							B-2b(6-8')
	SILTY SAND					*ND		
8.0								
	Boring Terminated at 8 Feet							

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

* ND indicates a reading of less than the field detection limit (FDL) of one (1) part per million isobutylene equivalents (ppmi).

Advancement Method:
Direct push

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

Notes:
Assistant Scientist: Juan Robles

WATER LEVEL OBSERVATIONS

None while drilling

None at completion

Terracon
135 Ambassador Dr
Naperville, IL

Boring Started: 02-13-2018 | Boring Completed: 02-13-2018

Drill Rig: GEOPROBE | Driller: Envirodynamics

Project No.: A2177092

BORING LOG NO. B-3b

PROJECT: Proposed Aerobic Digester

CLIENT: Green Era NFP

SITE: 650 West 83rd Street
Chicago, Illinois

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	RECOVERY (In.)	OVA/PID (ppm)	SAMPLE	SAMPLE SENT TO LAB (ID NUMBER)
	FILL - SILTY SAND, Crushed concrete and gravel, Dark brown		*ND		
2.0		46		1	
2.5	**FILL - SILTY SAND**, crushed red brick		*ND		
	SILTY SAND, with gravel, Dark brown				
4.0					
	SILTY SAND, trace of stone, Dark brown, wet		*ND		
5		48		2	B-3b(4-6') B-3b(6-8')
7.0			*ND		
	SILTY SAND, trace of gravel, wet		*ND		
10		45		3	B-3b(8-10') B-3b(10-12')
12.0			*ND		
	Boring Terminated at 12 Feet				

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

* ND indicates a reading of less than the field detection limit (FDL) of one (1) part per million isobutylene equivalents (ppmi).

Advancement Method:
Direct push

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

Notes:
Assistant Scientist: Juan Robles

WATER LEVEL OBSERVATIONS

None while drilling

None at completion

Terracon
135 Ambassador Dr
Naperville, IL

Boring Started: 02-13-2018 | Boring Completed: 02-13-2018

Drill Rig: GEOPROBE | Driller: Envirodynamics

Project No.: A2177092

BORING LOG NO. B-36b

PROJECT: Proposed Aerobic Digester

CLIENT: Green Era NFP

**SITE: 650 West 83rd Street
Chicago, Illinois**

LOCATION See Exhibit 2

GRAPHIC LOG	DEPTH	MATERIAL DESCRIPTION	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	OVA/PID (ppm)	SAMPLE	SAMPLE SENT TO LAB (ID NUMBER)
		FILL - CONCRETE, coarse gravel, trace of red brick and stone, Dark brown, moist					*ND		B-36b (1-3')
						48		1	
							*ND		
	4.0								
		SILTY CLAY (CL), coarse gravel with trace of stone, Dark brown, wet	5				*ND		
	6.0								
		SILTY SAND, trace of stone, Dark brown, wet				48		2	B-36b (4-6')
							*ND		
	8.0								
		Boring Terminated at 8 Feet							

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

* ND indicates a reading of less than the field detection limit (FDL) of one (1) part per million isobutylene equivalents (ppmi).

Advancement Method:
Direct push

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

Notes:
Assistant Scientist: Juan Robles

WATER LEVEL OBSERVATIONS

None while drilling

None at completion

Terracon
135 Ambassador Dr
Naperville, IL

Boring Started: 02-13-2018 | Boring Completed: 02-13-2018

Drill Rig: GEOPROBE | Driller: Envirodynamics

Project No.: A2177092

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING


Auger


Split Spoon


Shelby Tube


Macro Core


Ring Sampler


Rock Core


Grab Sample


No Recovery

WATER LEVEL


Water Initially Encountered


Water Level After a Specified Period of Time


Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(b/f)	Standard Penetration Test (blows per foot)
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance Includes gravels, sands and silts.			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance			
Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.
Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1	< 3
Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4	3 - 4
Medium Dense	10 - 29	19 - 58	Medium-Stiff	1,000 to 2,000	4 - 8	5 - 9
Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 15	10 - 18
Very Dense	> 50	≥ 99	Very Stiff	4,000 to 8,000	15 - 30	19 - 42
			Hard	> 8,000	> 30	> 42

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

Terracon

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]					Soil Classification	
					Group Symbol	Group Name[B]
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $1 \leq Cc \leq 3^E$		GW	Well-graded gravel[F]
			$Cu < 4$ and/or $1 > Cc > 3^E$		GP	Poorly graded gravel[F]
		Gravels with Fines More than 12% fines[C]	Fines classify as ML or MH		GM	Silty gravel[F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	$Cu \geq 6$ and $1 \leq Cc \leq 3^E$		SW	Well-graded sand[I]
			$Cu < 6$ and/or $1 > Cc > 3^E$		SP	Poorly graded sand[I]
		Sands with Fines More than 12% fines[D]	Fines classify as ML or MH		SM	Silty sand[G,H,I]
			Fines Classify as CL or CH		SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	inorganic	PI > 7 and plots on or above "A" line[J]		CL	Lean clay[K,L,M]
			PI < 4 or plots below "A" line[J]		ML	Silt[K,L,M]
		organic	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OL	Organic clay[K,L,M,N] / Organic silt[K,L,M,O]
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line		CH	Fat clay[K,L,M]
			PI plots below "A" line		MH	Elastic Silt[K,L,M]
		organic	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OH	Organic clay[K,L,M,P] / Organic silt[K,L,M,Q]
Highly organic soils	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

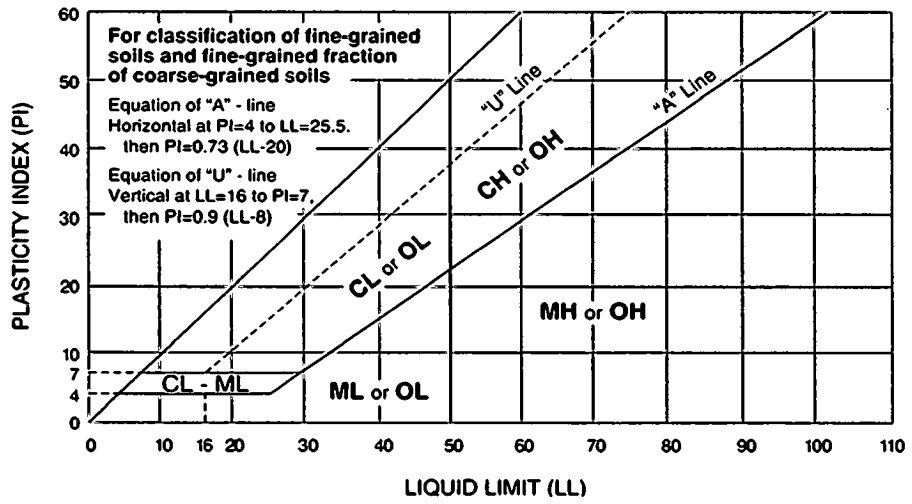
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Terracon

Form 111—6/98

Terracon

Appendix C
Laboratory Analytical Report

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditations: IEPA ELAP 100445; ORELAP IL300001; AIHA-LAP, LLC 101160; NVLAP LabCode 101202-0

February 19, 2018

Terracon Consultants, Inc.
650 W. Lake Street
Chicago, IL 60661

Telephone: (312) 575-0014
Fax: (312) 575-0111

Analytical Report for STAT Work Order: 18020267 Revision 0

RE: A2177092, Proposed Aerobic Digester Facility, 650 West 83rd Street

Dear Richard O'Brien:

STAT Analysis received 11 samples for the referenced project on 2/13/2018 2:15:00 PM. The analytical results are presented in the following report.

All analyses were performed in accordance with the requirements of 35 IAC Part 186 / NELAP standards. Analyses were performed in accordance with methods as referenced on the analytical report. Those analytical results expressed on a dry weight basis are also noted on the analytical report.

All analyses were performed within established holding time criteria, and all Quality Control criteria met EPA or laboratory specifications except when noted in the Case Narrative or Analytical Report. If required, an estimate of uncertainty for the analyses can be provided. A listing of accredited methods/parameters can also be provided.

Thank you for the opportunity to serve you and I look forward to working with you in the future. If you have any questions regarding the enclosed materials, please contact me at (312) 733-0551.

Sincerely,

Justice Kwateng
Project Manager

STAT Analysis Corporation

Date: February 19, 2018

Client: Terracon Consultants, Inc.
Project: A2177092, Proposed Aerobic Digester Facility, 650 W
Work Order: 18020267 Revision 0

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
18020267-001A	B-1b (1-3')		2/13/2018 10:35:00 AM	2/13/2018
18020267-002A	B-1b (4-5.5')		2/13/2018 10:40:00 AM	2/13/2018
18020267-003A	B-2b (1-3')		2/13/2018 10:55:00 AM	2/13/2018
18020267-004A	B-2b (4-6')		2/13/2018 11:00:00 AM	2/13/2018
18020267-005A	B-2b (6-8')		2/13/2018 11:05:00 AM	2/13/2018
18020267-006A	B-3b (4-6')		2/13/2018 11:20:00 AM	2/13/2018
18020267-007A	B-3b (6-8')		2/13/2018 11:25:00 AM	2/13/2018
18020267-008A	B-3b (8-10')		2/13/2018 11:30:00 AM	2/13/2018
18020267-009A	B-3b (10-12')		2/13/2018 11:35:00 AM	2/13/2018
18020267-010A	B-36b (1-3')		2/13/2018 12:30:00 PM	2/13/2018
18020267-011A	B-36b (4-6')		2/13/2018 12:35:00 PM	2/13/2018

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditations:IEPA ELAP 100445;ORELAP IL300001;AIHA-LAP, LLC 101160;NVLAP LabCode 101202-0

Date Reported: February 19, 2018
Date Printed: February 19, 2018

ANALYTICAL RESULTS

Client: Terracon Consultants, Inc.
Project: A2177092, Proposed Aerobic Digester Facility, 650 Wes **Work Order:** 18020267 Revision 0

Lab ID: 18020267-001 **Collection Date:** 2/13/2018 10:35:00 AM
Client Sample ID B-1b (1-3') **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
SPLP Metals by ICP/MS		**SW1312/6020A (SW3005A)**		Prep Date: **2/14/2018**		Analyst: **JG**
Copper	ND	0.020		mg/L	2	2/15/2018
Zinc	ND	0.020		mg/L	2	2/15/2018
SPLP Mercury		**SW1312/7470A**		Prep Date: **2/14/2018**		Analyst: **LB**
Mercury	ND	0.00020		mg/L	1	2/14/2018

Lab ID: 18020267-002 **Collection Date:** 2/13/2018 10:40:00 AM
Client Sample ID B-1b (4-5.5') **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
SPLP Metals by ICP/MS		**SW1312/6020A (SW3005A)**		Prep Date: **2/14/2018**		Analyst: **JG**
Beryllium	ND	0.0020		mg/L	2	2/15/2018
Manganese	ND	0.0040		mg/L	2	2/15/2018
TCLP Metals by ICP/MS		**SW1311/6020A (SW3005A)**		Prep Date: **2/14/2018**		Analyst: **JG**
Lead	0.033	0.0050		mg/L	5	2/14/2018

Lab ID: 18020267-003 **Collection Date:** 2/13/2018 10:55:00 AM
Client Sample ID B-2b (1-3') **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
SPLP Metals by ICP/MS		**SW1312/6020A (SW3005A)**		Prep Date: **2/14/2018**		Analyst: **JG**
Copper	ND	0.020		mg/L	2	2/15/2018
Zinc	0.041	0.020		mg/L	2	2/15/2018
SPLP Mercury		**SW1312/7470A**		Prep Date: **2/14/2018**		Analyst: **LB**
Mercury	ND	0.00020		mg/L	1	2/14/2018

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditations:IEPA ELAP 100445;ORELAP IL300001;AIHA-LAP, LLC 101160;NVLAP LabCode 101202-0

Date Reported: February 19, 2018
Date Printed: February 19, 2018

ANALYTICAL RESULTS

Client: Terracon Consultants, Inc.
Project: A2177092, Proposed Aerobic Digester Facility, 650 Wes **Work Order:** 18020267 Revision 0

Lab ID: 18020267-004 **Collection Date:** 2/13/2018 11:00:00 AM
Client Sample ID B-2b (4-6') **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
SPLP Metals by ICP/MS		**SW1312/6020A (SW3005A)**		Prep Date: **2/14/2018**		Analyst: **JG**
Beryllium	ND	0.0020		mg/L	2	2/15/2018
Manganese	0.026	0.0040		mg/L	2	2/15/2018
TCLP Metals by ICP/MS		**SW1311/6020A (SW3005A)**		Prep Date: **2/14/2018**		Analyst: **JG**
Lead	0.21	0.0050		mg/L	5	2/14/2018

Lab ID: 18020267-006 **Collection Date:** 2/13/2018 11:20:00 AM
Client Sample ID B-3b (4-6') **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
SPLP Metals by ICP/MS		**SW1312/6020A (SW3005A)**		Prep Date: **2/14/2018**		Analyst: **JG**
Cadmium	ND	0.0020		mg/L	2	2/15/2018
Selenium	ND	0.0040		mg/L	2	2/15/2018

Lab ID: 18020267-007 **Collection Date:** 2/13/2018 11:25:00 AM
Client Sample ID B-3b (6-8') **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
TCLP Metals by ICP/MS		**SW1311/6020A (SW3005A)**		Prep Date: **2/14/2018**		Analyst: **JG**
Lead	1.1	0.0050		mg/L	5	2/14/2018

Lab ID: 18020267-010 **Collection Date:** 2/13/2018 12:30:00 PM
Client Sample ID B-36b (1-3') **Matrix:** Soil

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
SPLP Metals by ICP/MS		**SW1312/6020A (SW3005A)**		Prep Date: **2/14/2018**		Analyst: **JG**
Barium	0.029	0.020		mg/L	2	2/15/2018

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

STAT Analysis Corporation
2242 W. Harrison Suite 200, Chicago, Illinois 60612 Phone: (312) 733-0551 Fax: (312) 733-2386
e-mail address: STATinfo@STATAnalysis.com

CHAIN OF CUSTODY RECORD **Nº: 913775** Page : of

Company: Terracon Consultants
Project Number: A2177092 Client Tracking No.:
Project Name: Proposed Aerobic Digester Facility
Project Location: 6050 West 83rd Street
Sampler(s): Juan Robles
Report To: Richard O'Brien Phone:
Fax:
QC Level: 1 ___ 2 ___ 3 ___ 4 ___ e-mail:

Quote No.:
P.O. No.:
Turn Around Time (Days): 1 2 3 4 (5-7) 10
Results Needed: / / am/pm

Client Sample Number/Description:	Date Taken	Time Taken	Matrix	Comp.	Grab	Preserv.	No. of Containers	SPLP Cu, Hg, Zn	SPLP Be	SPLP Mn	SPLP Ba	SPLP Cd	SPLP Se	TCLP Pb	Hold	Additional Information:	Lab No.:
B-1b (1-3')	2/13/18	10:35	S				1	X									001
B-1b (4-5.5')		10:40							X	X				X			002
B-2b (1-3')		10:55						X									003
B-2b (4-6')		11.00							X	X				X			004
B-2b (6-8')		11:05													X		005
B-3b (4-6')		11:20										X	X				006
B-3b (6-8')		11:25												X			007
B-3b (8-10')		11:30													X		008
B-3b (10-12')		11:35													X		009
B-3bb (1-3')		12:30									X						010
B-3bb (4-6')		12:35													X		011

Relinquished by: (Signature) Juan Robles Date/Time: 2/13/18 14:15
Received by: (Signature) Date/Time: 2/13/18 14:15
Relinquished by: (Signature) Date/Time:
Received by: (Signature) Date/Time:
Relinquished by: (Signature) Date/Time:
Received by: (Signature) Date/Time:

Comments:

Laboratory Work Order No.: 18020267

Received on Ice: Yes ☑ No ☐
Temperature: On Ice °C

Preservation Code: A = None B = HNO_3 C = NaOH
D = H_2SO_4 E = HCl F = 5035/EnCore G = Other

STAT Analysis Corporation

Sample Receipt Checklist

Client Name **TERRACON-NAPERVILLE** Date and Time Received: **2/13/2018 2:15:00 PM**

Work Order Number **18020267** Received by: **JNW**

Checklist completed by: _____ 2/13/18 (Signature / Date) Reviewed by: JDK 2/13/18 (Initials / Date)

Matrix: Carrier name: Client Delivered

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels/containers?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container or Temp Blank temperature in compliance?	Yes ☑	No ☐	Temperature On Ice °C
Water - VOA vials have zero headspace?	No VOA vials submitted ☒	Yes ☒	No ☒
Water - Samples pH checked?	Yes ☒	No ☒	Checked by: _____
Water - Samples properly preserved?	Yes ☒	No ☒	pH Adjusted? _____

Any No response must be detailed in the comments section below.

Comments: _____

Client / Person contacted: _____ Date contacted: _____ Contacted by: _____

Response: _____

Terracon

Appendix D
Tier 2 Equation S3 &
Excerpts from USEPA's Toxicological Review of Benzo(a)pyrene, January 2017

742 Appendix C, Table A - Equation S3
Benzo(a)pyrene
Equation for the Soil Ingestion Exposure Route
Remediation Objectives for Carcinogenic Contaminants -
Industrial/Commercial, Construction Worker (mg/kg)

$$\text{Remediation Objective} = \frac{TR \bullet BW \bullet AT_c \bullet 365 \frac{d}{yr}}{SF_o \bullet 10^{-6} \frac{kg}{mg} \bullet EF \bullet ED \bullet IR_{soil}}$$

Site-Wide Parameters				
Parameter	**Symbol**	**Units**	**Source**	**Value**
Target Cancer Risk	TR	unitless	Default	0.000001
Averaging Time for Carcinogens	AT_c	yr	Default	70
Exposure Frequency	EF	d/yr	Default - Industrial/Commercial	250
Exposure Duration for Ingestion of Carcinogens	ED	yr	Default - Industrial/Commercial	25
Body Weight	BW	kg	Default - Industrial/Commercial	70
Soil Ingestion Rate	IR_{soil}	mg/d	Default - Industrial/Commercial	50

Chemical-Specific Parameters and Calculations		
Contaminant of Concern	**Oral Slope Factor ([mg/kg-d)$^{-1}$]) ***	**Remediation Objective (mg/kg)**
Benzo(a)pyrene	1	5.72

* Oral Slope Factor per USEPA's 2017 document "Toxicological Review of Benzo[a]pyrene'
https://cfpub.epa.gov/ncea/iris/iris_documents/documents/toxreviews/0136tr.pdf

EPA/635/R-17/003Fa
www.epa.gov/iris

Toxicological Review of Benzo[a]pyrene

[CASRN 50-32-8]

January 2017

Integrated Risk Information System
National Center for Environmental Assessment
Office of Research and Development
U.S. Environmental Protection Agency
Washington, DC

Excerpts Included

Full document can be found:

https://cfpub.epa.gov/ncea/iris_documents/documents/toxreviews/0136tr.pdf

EXECUTIVE SUMMARY

Summary of Occurrence and Health Effects

Benzo[a]pyrene is a five-ring polycyclic aromatic hydrocarbon (PAH). Benzo[a]pyrene (along with other PAHs) is released into the atmosphere as a component of smoke from forest fires, industrial processes, vehicle exhaust, cigarettes, and through the burning of fuel (such as wood, coal, and petroleum products). Oral exposure to benzo[a]pyrene can occur by eating certain food products, such as charred meats, where benzo[a]pyrene is formed during the cooking process, or by eating foods grown in areas contaminated with benzo[a]pyrene (from the air and soil). Dermal exposure may occur from contact with soils or materials that contain soot, tar, or crude petroleum products or by using certain pharmaceutical products containing coal tars, such as those used to treat the skin conditions, eczema and psoriasis. The magnitude of human exposure to benzo[a]pyrene and other PAHs depends on factors such as lifestyle (e.g., diet, tobacco smoking), occupation, and living conditions (e.g., urban versus rural setting, domestic heating, and cooking methods).

Animal studies demonstrate that exposure to benzo[a]pyrene is associated with developmental (including developmental neurotoxicity), reproductive, and immunological effects. In addition, epidemiology studies involving exposure to PAH mixtures have reported associations between internal biomarkers of exposure to benzo[a]pyrene (benzo[a]pyrene diol epoxide-DNA adducts) and adverse birth outcomes (including reduced birth weight, postnatal body weight, and head circumference), neurobehavioral effects, and decreased fertility.

Studies in multiple animal species demonstrate that benzo[a]pyrene is carcinogenic at multiple tumor sites (alimentary tract, liver, kidney, respiratory tract, pharynx, and skin) by all routes of exposure. In addition, there is strong evidence of carcinogenicity in occupations involving exposure to PAH mixtures containing benzo[a]pyrene, such as aluminum production, chimney sweeping, coal gasification, coal-tar distillation, coke production, iron and steel founding, and paving and roofing with coal tar pitch. An increasing number of occupational studies demonstrate a positive exposure-response relationship with cumulative benzo[a]pyrene exposure and lung cancer.

Effects Other Than Cancer Observed Following Oral Exposure

In animals, oral exposure to benzo[a]pyrene has been shown to result in developmental toxicity (including developmental neurotoxicity), reproductive toxicity, and immunotoxicity. Developmental effects in rats and mice include neurobehavioral changes and cardiovascular effects following gestational exposures. Reproductive and immune effects include decreased sperm counts, ovary weight, and follicle numbers, and decreased immunoglobulin and B cell numbers and thymus weight following oral exposures in adult animals. In humans, benzo[a]pyrene exposure occurs in conjunction with other PAHs and, as such, attributing the observed effects to

benzo[a]pyrene is complicated. However, some human studies report associations between particular health endpoints and internal measures of exposure, such as benzo[a]pyrene-deoxyribonucleic acid (DNA) adducts, or external measures of benzo[a]pyrene exposure. Overall, the human studies report developmental, neurobehavioral, reproductive, and immune effects that are generally analogous to those observed in animals, and provide qualitative, supportive evidence for hazards associated with benzo[a]pyrene exposure.

Oral Reference Dose (RfD) for Effects Other Than Cancer

Organ- or system-specific RfDs were derived for hazards associated with benzo[a]pyrene exposure where data were amenable (see Table ES-1). These organ- or system-specific reference values may be useful for subsequent cumulative risk assessments that consider the combined effect of multiple agents acting at a common site.

Developmental toxicity, represented by neurobehavioral changes persisting into adulthood, was chosen as the basis for the overall oral RfD as the available data indicate that developmental neurotoxicity represents the most sensitive hazard of benzo[a]pyrene exposure. The neurodevelopmental study by Chen et al. (2012) was used to derive the RfD. Altered responses in three behavioral tests (i.e., Morris water maze, elevated plus maze, and open field tests) were selected to represent the critical effect of abnormal behavior, due to the consistency (i.e., each of these responses were affected in two separate cohorts of rats, including testing as juveniles and as adults; similar effects in these behavioral tests were observed across studies) and sensitivity of these responses, and the observed dose-response relationship of effects across dose groups. Benchmark dose (BMD) modeling for each of the three endpoints resulted in $BMDL_{1SD}$ values that clustered in the range 0.092–0.16 mg/kg-day. The lower end of this range of BMDLs, 0.092 mg/kg-day, was selected to represent the point of departure (POD) from these three endpoints for RfD derivation.

The overall RfD was calculated by dividing the POD for altered behavior in three tests of nervous system function by a composite uncertainty factor (UF) of 300 to account for the extrapolation from animals to humans (10), for interindividual differences in human susceptibility (10), and for deficiencies in the toxicity database (3).

Table ES-1. Organ/system-specific RfDs and overall RfD for benzo[a]pyrene

Effect	Basis	RfD (mg/kg-d)	Confidence
Developmental	Neurobehavioral changes Gavage neurodevelopmental study in rats (postnatal days [PNDs] 5–11) Chen et al. (2012)	3×10^{-4}	Medium
Reproductive	Decreased ovarian follicles and ovary weight Gavage subchronic (60 d) reproductive toxicity study in rats Xu et al. (2010)	4×10^{-4}	Medium
Immunological	Decreased thymus weight and serum IgM Gavage subchronic (35 d) study in rats De Jong et al. (1999) and Kroese et al. (2001)	2×10^{-3}	Low
Overall RfD	**Developmental toxicity (including developmental neurotoxicity)**	3×10^{-4}	**Medium**

Confidence in the Overall Oral RfD

The overall confidence in the RfD is medium. Confidence in the principal study (Chen et al., 2012) is medium. The design, conduct, and reporting of this neurodevelopmental study was good and a wide variety of neurotoxicity endpoints were measured across 40 litters of rats. However, some uncertainty exists regarding the authors' use of dam rotation across litters (an attempt to reduce potential nurturing bias) and a within-litter dosing design, by potentially introducing maternal stress or other unanticipated consequences in the pups, and some informative experimental details were omitted, including the sensitivity of some assays at the indicated developmental ages and lack of reporting of individual animal- or gender-specific data for all outcomes. Several subchronic and developmental studies covering a wide variety of endpoints are also available; however, a multigeneration toxicity study with exposure throughout development and across generations is not available, and the available neurotoxicity studies did not comprehensively evaluate all potentially vulnerable lifestages of nervous system development. Therefore, confidence in the database is medium.

Effects Other Than Cancer Observed Following Inhalation Exposure

In animals, inhalation exposure to benzo[a]pyrene has been shown to result in developmental and reproductive toxicity. Studies in rats following inhalation exposure show decreased embryo/fetal survival and nervous system effects in offspring, and decreased testes weight and sperm counts in adult animals. Overall, the available human PAH mixtures studies report developmental and reproductive effects that are generally analogous to those observed in animals, and provide qualitative, supportive evidence for the hazards associated with benzo[a]pyrene exposure.

Inhalation Reference Concentration (RfC) for Effects Other Than Cancer

An attempt was made to derive organ- or system-specific RfCs for hazards associated with benzo[a]pyrene exposure where data were amenable (see Table ES-2). These organ- or system-specific reference values may be useful for subsequent cumulative risk assessments that consider the combined effect of multiple agents acting at a common site.

Developmental toxicity, represented by decreased embryo/fetal survival, was chosen as the basis for the proposed inhalation RfC as the available data indicate that developmental effects represent a sensitive hazard of benzo[a]pyrene exposure. The developmental inhalation study in rats by Archibong et al. (2002) and the observed decreased embryo/fetal survival (i.e., increased resorptions) following exposure to benzo[a]pyrene on gestation days (GDs) 11–20 were used to derive the overall RfC. The lowest-observed-adverse-effect level (LOAEL) of 25 μg/m^3 based on decreased embryo/fetal survival was selected as the POD. The LOAEL was adjusted to account for the discontinuous daily exposure to derive the POD_{ADJ} and the human equivalent concentration (HEC) was calculated from the POD_{ADJ} by multiplying by the regional deposited dose ratio ($RDDR_{ER}$) for extrarespiratory (i.e., systemic) effects, as described in *Methods for Derivation of Inhalation Reference Concentrations and Application of Inhalation Dosimetry* (U.S. EPA, 1994b). These adjustments resulted in a POD_{HEC} of 4.6 μg/m^3, which was used as the POD for RfC derivation.

The RfC was calculated by dividing the POD by a composite UF of 3,000 to account for toxicodynamic differences between animals and humans (3), interindividual differences in human susceptibility (10), LOAEL-to-no-observed-adverse-effect level (NOAEL) extrapolation (10), and deficiencies in the toxicity database (10).

Table ES-2. Organ/system-specific RfCs and overall RfC for benzo[a]pyrene

Effect	Basis	RfC (mg/m^3)	Confidence
Developmental	Decreased embryo/fetal survival Developmental toxicity study in rats (GDs 11–20) Archibong et al. (2002)	2×10^{-6}	Low-medium
Reproductive	Reduced ovulation rate and ovary weight Premating study in rats (14 d) Archibong et al. (2012)	3×10^{-6}	Low-medium
Overall RfC	**Developmental toxicity**	2×10^{-6}	Low-medium

Confidence in the Overall Inhalation RfC

The overall confidence in the RfC is low-to-medium. Confidence in the principal study (Archibong et al., 2002) is medium. The conduct and reporting of this developmental inhalation study were adequate; however, a NOAEL was not identified. Confidence in the database is low due to the lack of a multigeneration toxicity study and the lack of information on varied toxicity

endpoints following subchronic and chronic inhalation exposure. However, confidence in the RfC is bolstered by consistent systemic effects observed by the oral route (including reproductive and developmental effects) and similar effects observed in human populations exposed to PAH mixtures.

Evidence for Human Carcinogenicity

Under EPA's *Guidelines for Carcinogen Risk Assessment* (U.S. EPA, 2005a), benzo[a]pyrene is "carcinogenic to humans" based on strong and consistent evidence in animals and humans. The evidence includes an extensive number of studies demonstrating carcinogenicity in multiple animal species exposed via all routes of administration and increased cancer risks, particularly in the lung and skin, in humans exposed to different PAH mixtures containing benzo[a]pyrene. Mechanistic studies provide strong supporting evidence that links the metabolism of benzo[a]pyrene to DNA-reactive agents with key mutational events in genes that can lead to tumor development. These events include formation of specific DNA adducts and characteristic mutations in oncogenes and tumor suppressor genes that have been observed in humans exposed to PAH mixtures. This combination of human, animal, and mechanistic evidence provides the basis for characterizing benzo[a]pyrene as "carcinogenic to humans."

Quantitative Estimate of Carcinogenic Risk From Oral Exposure

Lifetime oral exposure to benzo[a]pyrene has been associated with forestomach, liver, oral cavity, jejunum or duodenum, and auditory canal tumors in male and female Wistar rats, forestomach tumors in male and female Sprague-Dawley rats, and forestomach, esophagus, tongue, and larynx tumors in female $B6C3F_1$ mice (male mice were not tested). Less-than-lifetime oral exposure to benzo[a]pyrene has also been associated with forestomach tumors in more than 10 additional bioassays with several strains of mice. The Kroese et al. (2001) and Beland and Culp (1998) studies were selected as the best available studies for dose-response analysis and extrapolation to lifetime cancer risk following oral exposure to benzo[a]pyrene. These studies included histological examinations for tumors in many different tissues, contained three exposure levels and controls, contained adequate numbers of animals per dose group (~50/sex/group), treated animals for up to 2 years, and included detailed reporting methods and results (including individual animal data).

Time-weighted average (TWA) daily doses were converted to human equivalent doses (HEDs) on the basis of (body weight [BW])$^{3/4}$ scaling (U.S. EPA, 1992). EPA then used the multistage-Weibull model for the derivation of the oral slope factor. This model was used because it incorporates the time at which death-with-tumor occurred and can account for differences in mortality observed between the exposure groups. Using linear extrapolation from the $BMDL_{10}$, human equivalent oral slope factors were derived for each gender/tumor site combination (slope factor = $0.1/BMDL_{10}$) reported by Kroese et al. (2001) and Beland and Culp (1998). The oral slope factor of **1 per mg/kg-day** based on the tumor response in the alimentary tract (forestomach,

esophagus, tongue, and larynx) of female $B6C3F_1$ mice (Beland and Culp, 1998) was selected as the factor with the highest value (most sensitive) among a range of slope factors derived.

Quantitative Estimate of Carcinogenic Risk From Inhalation Exposure

Inhalation exposure to benzo[a]pyrene has been associated with squamous cell neoplasia in the larynx, pharynx, trachea, nasal cavity, esophagus, and forestomach of male Syrian golden hamsters exposed for up to 130 weeks to benzo[a]pyrene condensed onto sodium chloride particles (Thyssen et al., 1981). Supportive evidence for the carcinogenicity of inhaled benzo[a]pyrene comes from additional studies with hamsters exposed to benzo[a]pyrene via intratracheal instillation. The Thyssen et al. (1981) bioassay represents the only study of lifetime exposure to inhaled benzo[a]pyrene.

A time-to-tumor dose-response model was fit to the TWA continuous exposure concentrations and the individual animal incidence data for the overall incidence of tumors in the upper respiratory tract or pharynx. The inhalation unit risk of **6×10^{-4} per µg/m³** was calculated by linear extrapolation (slope factor = $0.1/BMCL_{10}$) from a $BMCL_{10}$ of 0.16 mg/m³ for the occurrence of upper respiratory and upper digestive tract (forestomach) tumors in male hamsters chronically exposed by inhalation to benzo[a]pyrene (Thyssen et al., 1981).

Quantitative Estimate of Carcinogenic Risk From Dermal Exposure

Skin cancer in humans has been documented to result from occupational exposure to complex mixtures of PAHs including benzo[a]pyrene, such as coal tar, coal tar pitches, unrefined mineral oils, shale oils, and soot. In animal models, numerous dermal bioassays have demonstrated an increased incidence of skin tumors with increasing dermal exposure of benzo[a]pyrene in all species tested, although most benzo[a]pyrene bioassays have been conducted in mice.

Carcinogenicity studies in animals by the dermal route of exposure are available for benzo[a]pyrene and are supportive of the overall cancer hazard. A quantitative estimate of skin cancer risk from dermal exposure is not included in this assessment, as methodology for interspecies extrapolation of dermal toxicokinetics and carcinogenicity are still under development.

Susceptible Populations and Lifestages

Benzo[a]pyrene has been determined to be carcinogenic by a mutagenic mode of action in this assessment. According to the *Supplemental Guidance for Assessing Susceptibility from Early Life Exposure to Carcinogens* (U.S. EPA, 2005b), individuals exposed during early life to carcinogens with a mutagenic mode of action are assumed to have an increased risk for cancer. The oral slope factor of 1 per mg/kg-day and inhalation unit risk of 0.0006 per µg/m³, calculated from data applicable to adult exposures, do not reflect presumed early life susceptibility to this chemical. Although some chemical-specific data exist for benzo[a]pyrene that demonstrate increased early life susceptibility to cancer, these data were not considered sufficient to develop separate risk estimates for childhood exposure. In the absence of adequate chemical-specific data to evaluate differences in

age-specific susceptibility, the *Supplemental Guidance* (U.S. EPA, 2005b) recommends that age-dependent adjustment factors (ADAFs) be applied in estimating cancer risk. The ADAFs are 10- and 3-fold adjustments that are combined with age specific exposure estimates when estimating cancer risks from early life (<16 years of age) exposures to benzo[a]pyrene.

Regarding effects other than cancer, there are epidemiological studies that report associations between developmental effects (decreased postnatal growth, decreased head circumference, and neurodevelopmental delays), reproductive effects, and internal biomarkers of exposure to benzo[a]pyrene. Studies in animals also indicate alterations in neurological development and heightened susceptibility to reproductive effects following gestational or early postnatal exposure to benzo[a]pyrene. More preliminary data suggest that effects on cardiovascular, kidney, pulmonary, and immune system development may result from early life exposures, although few in vivo developmental studies exist to confirm these findings.

Key Issues Addressed in Assessment

The overall RfD and RfC were developed based on effects observed following exposure to benzo[a]pyrene during a critical window of development. The derivation of a general population toxicity value based on exposure during development has implications regarding the evaluation of populations exposed outside of the developmental period and the averaging of exposure to durations outside of the critical window of susceptibility. Discussion of these considerations is provided in Sections 2.1.5 and 2.2.5.

dosimetry and given the systemic component of the tumor profile, the time-weighted daily average doses were converted to HEDs on the basis of $BW^{3/4}$. This was accomplished by multiplying administered doses by (animal body weight [kg])/70 kg)$^{1/4}$, where the animal body weights were TWAs from each group, and the U.S. EPA (1988) reference body weight for humans is 70 kg.

PODs for estimating low-dose risk were identified at doses at the lower end of the observed data, corresponding to 10% extra risk. Details of the modeling and the model selection process can be found in Appendix E.2 of the Supplemental Information.

2.3.3. Derivation of the Oral Slope Factor

The PODs estimated for each tumor site are summarized in Table 2-7. The lifetime oral cancer slope factor for humans is defined as the slope of the line from the lower 95% bound on the exposure at the BMD to the control response (slope factor = $0.1/BMDL_{10}$). This slope represents a plausible upper bound on the true risk. Using linear extrapolation from the $BMDL_{10}$, human equivalent oral slope factors were derived for each gender/tumor site combination and are listed in Table 2-7.

Oral slope factors derived from rat bioassay data varied by gender and tumor site (Table 2-7). Values ranged from 0.04 per mg/kg-day, based on kidney tumors in males, to 0.4 per mg/kg-day, based on alimentary tract tumors in males. Slope factors based on liver tumors in male and female rats (0.2 per mg/kg-day) were only slightly lower than slope factors based on alimentary tract tumors (0.2–0.3 per mg/kg-day). The oral slope factor for alimentary tract tumors in female mice was highest at 1 per mg/kg-day (Table 2-7), which was approximately 2-fold higher than the oral slope factor derived from the alimentary tract tumors in male rats.

Table 2-7. Summary of the oral slope factor derivations

Tumor	Species/ sex	Selected model	BMR	BMD (mg/kg-d)	POD = BMDL (mg/kg-d)	Slope factor[a] $(mg/kg\text{-}d)^{-1}$	
Forestomach, oral cavity: squamous cell tumors Kroese et al. (2001)	Male Wistar rats	Multistage Weibull	10%	0.453	0.281	0.36	
Hepatocellular adenomas or carcinomas Kroese et al. (2001)	Male Wistar rats	Multistage Weibull	10%	0.651	0.449	0.22	
Jejunum/duodenum adenocarcinomas Kroese et al. (2001)	Male Wistar rats	Multistage Weibull	10%	3.03	2.38	0.042	
Kidney: urothelial carcinomas Kroese et al. (2001)	Male Wistar rats	Multistage Weibull	10%	4.65	2.50	0.040	0.5[b]

Tumor	Species/ sex	Selected model	BMR	BMD (mg/kg-d)	POD = BMDL (mg/kg-d)	Slope factor[a] $(mg/kg\text{-}d)^{-1}$	
Skin, mammary: Basal cell tumors Squamous cell tumors Kroese et al. (2001)	Male Wistar rats	Multistage Weibull	10%	 2.86 2.64	 2.35 1.77	 0.043 0.056	
Forestomach, oral cavity: squamous cell tumors Kroese et al. (2001)	Female Wistar rats	Multistage Weibull	10%	0.539	0.328	0.3	0.31[b]
Hepatocellular adenomas or carcinomas Kroese et al. (2001)	Female Wistar rats	Multistage Weibull	10%	0.575	0.507	0.2	
Jejunum/duodenum adenocarcinomas Kroese et al. (2001)	Female Wistar rats	Multistage Weibull	10%	3.43	1.95	0.05	
Forestomach, esophagus, tongue, larynx (alimentary tract): squamous cell tumors Beland and Culp (1998)	Female $B6C3F_1$ mice	Multistage Weibull	10%	0.127	0.071	1.4	1.4

[a]Human equivalent slope factor = $0.1/BMDL_{10HED}$; see Appendix E of the Supplemental Information for details of modeling results.
[b]Slope factor characterizing the risk of incurring at least one of the tumor types listed.

Although the time-to-tumor modeling helps to account for competing risks associated with decreased survival times and other causes of death including other tumors, considering the tumor sites individually does not convey the total amount of risk potentially arising from the sensitivity of multiple sites—that is, the risk of developing any combination of the increased tumor types. A method for estimating overall risk, involving the assumption that the variability in the slope factors could be characterized by a normal distribution, is detailed in Appendix E.2.1 of the Supplemental Information. The resulting composite slope factor for all tumor types for male rats was 0.5 per mg/kg-day, about 25% higher than the slope factor based on the most sensitive tumor site, oral cavity and forestomach, while for female rats, the composite slope factor did not increase from that for the most sensitive site (Tables 2-, E-27).

The overall risk estimates from male and female rats and female mice spanned about a 5-fold range. While EPA's cancer guidelines (U.S. EPA, 2005a) suggest "choosing a single datset if it can be justified as most representative of the overall response in humans," there are no data to support any one result as most relevant for extrapolating to humans. Under the assumption that the three data sets are equally relevant for extrapolating to humans, geometric and harmonic mean of the three slope factors derived here round to 0.60 and 0.50 per mg/kg-day, respectively, about 40% of the highest slope factor. A geometric mean that gives equal weight to rats and mice is 0.74 per mg/kg-day, about 50% of the highest slope factor.

Another consideration in developing a human-equivalent slope factor is that slope factors are intended to provide an upper bound on the cancer risk of a randomly selected individual (U.S. EPA, 2005a), yet EPA's approach to quantifying low-dose cancer risk relies on a 95% upper bound on the cancer risk that typically only addresses experimental variability in homogeneous laboratory animals. The NRC (2009) observed that when cancer risk is expected to be linear at low exposures, as with benzo[a]pyrene, EPA's cancer risk values tend not to address human variability and susceptibility adequately. Concern for sensitive populations (separate from the consideration of increased sensitivity at early lifestages; see Section 2.5, Application of Age-Dependent Adjustment Factors [ADAFs]) suggests interpreting the near-continuous range of risk-estimate confidence intervals (CIs) from the three data sets (see CIs in Tables E-27 and E-28), of 0–1.4 per mg/kg-day, to represent a more heterogeneous population and supports use of the high value as a plausible upper bound.

Potential for model uncertainty in the slope factor estimate is also a relevant consideration at this stage. Although EPA's practice has been to rely on multistage models (including the multistage-Weibull model) for carcinogens with a mutagenic mode of action and expected low-dose linear behavior, some model uncertainty was evaluated by applying the range of dichotomous models in BMDS to the B6C3F$_1$ mice data (Beland and Culp, 1998), after adjustment for intercurrent mortality using the poly-3 approach (Bailer and Portier, 1988). Even including less plausible models that impose nonlinear, low-dose behavior that is inconsistent with a mutagenic mode of action—i.e., models fit with a slope of 0 risk/dose unit as doses decrease to 0—for each data set, the resulting BMD_{10} and $BMDL_{10}$ values were found to encompass the corresponding multistage-Weibull estimate, and to vary overall <2-fold, and less than a factor of 1.5 from the multistage-Weibull estimate (see Appendix E.2.1). Model uncertainty is minimized through the POD being near the lowest exposure in each of the data sets.

Given these considerations, EPA selected the most sensitive result to derive the oral slope factor. The slope factor for assessing human cancer risk associated with lifetime oral exposure to benzo[a]pyrene is **1 per mg/kg-day**, based on the alimentary tract tumor response in female B6C3F$_1$ mice. Note that the oral slope factor should only be used with lifetime human exposures <0.1 mg/kg-day, because above this level, the dose-response relationship is nonlinear and plateaus at 100% at higher exposures. If risk estimates for exposure above 0.1 mg/kg-day would be needed—that is, corresponding to expected overall cancer risks greater than 10%—the full dose-response model as provided in Appendix E.2.1 should be consulted.

The oral slope factor for benzo[a]pyrene is derived with the intention that it will be paired with EPA's relative potency factors for the assessment of the carcinogenicity of PAH mixtures. In addition, regarding the assessment of early life exposures, because cancer risk values calculated for benzo[a]pyrene were derived from adult animal exposures, and because benzo[a]pyrene carcinogenicity occurs via a mutagenic mode of action, exposures that occur during development should include the application of ADAFs (see Section 2.5).

Terracon

Appendix E – Proposed Geotextile Fabric Liner

Construction Geosynthetics

WARNING BARRIER

US 100NW-HVO Warning Barrier

US 100NW-HVO is a nonwoven, needle-punched, ORANGE warning barrier / contamination barrier geotextile. US 100NW-HVO resists ultraviolet and biological deterioration, rotting, naturally encountered basics and acids. Polypropylene is stable within a pH range of 2 to 13. US 100NW-HVO meets the following typical values:

Property	Test Method	English	Metric
Weight	ASTM D-5261	3.8 oz/sy	129 g/sm
Tensile Strength	ASTM D-4632	100 lbs	445 N
Elongation @ Break	ASTM D-4632	75%	75%
Thickness	ASTM D-5199	35 mils	0.90 mm
CBR Puncture	ASTM D-6241	310 lbs	1,380 N
Trapezoidal Tear	ASTM D-4533	50 lbs	223 N
Permittivity	ASTM D-4491	2.40 Sec-1	2.40 Sec-1
Water Flow Rate	ASTM D-4491	175 g/min/sf	7,130 l/min/sm
UV Resistance @ 500 Hours	ASTM D-4355	70%	70%

Roll Size	Roll Diameter	Area	Weight
15' x 360'	13.0 in	600 sys	157 lbs

US Fabrics, Inc. | 3904 Virginia Avenue | Cincinnati, OH 45227
Phone: (800) 518-2290 | Fax: (513) 217-4420 | email: info@usfabrics.com

Terracon

Appendix F
IEPA Letter – Updated Review of CSIR/ROR/RAP, September 5, 2017

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

217-524-3300

September 5, 2017

Green Era Educational NFP
Attn: Mr. Jason Feldman
218 North Jefferson Street, Suite 300
Chicago, Illinois 60661

Re: 0316715228 /Cook County
Chicago/City of Chicago-Dept. of Fleet Mgmt.
Site Remediation/Technical Reports

Dear Mr. Feldman:

As part of the Revolving Loan Fund (RFL), The Illinois Environmental Protection Agency (Illinois EPA) has updated the review the *Comprehensive Site Investigation Report, Remediation Objectives Report, Remedial Action Plan* (dated May 29, 2015/Log No. 15-59594). The Illinois EPA has the following comments:

1) The sampling rate for clean soil is a sample every 500 yds3, please adjust for this in the proposed budget plan.

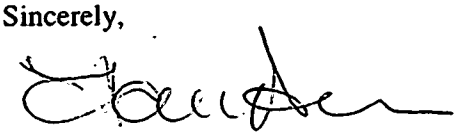
2) The indoor inhalation exposure route was briefly mentioned in the report. To elaborate, it appears the areas with the highest mercury detection are on the eastern side of the site, near areas proposed for excavation and stabilization. There were no detections of mercury in groundwater or soil gas samples. Naphthalene was detected in one soil gas sample below objectives but was not detected in groundwater. The indoor inhalation exposure route does not appear to be of any potential threat to off-site migration. As for any site with detections of volatiles, there will be a restriction that will require a slab-on-grade construction with no sump-pumps.

3) Details of the proposed Soil Management Zone need to be submitted in an addendum to the RAP. A figure depicting the three-dimensional boundaries is required, see 35 IAC 740.535 for all requirements.

4) Please provide a new DRM-1 Form with updated information and signatures for the Remedial Applicant and the property owner.

You can call me or email me at tammy.smith@illinois.gov should you have any questions.

Sincerely,



Tammy Smith
Voluntary Site Remediation Unit
Remedial Project Management Section
Bureau of Land

cc: Linda Yang, Terracon – linda.yang@terracon.com
Richard O'Brien, Terracon – richard.o'brien@terracon.com

Terracon

Appendix G
Information on MWRDGC Exceptional Quality Biosolids

What are EQ Biosolids

EQ Biosolids are a product of wastewater treatment that supplies organic matter and improves the structure and porosity of soils, which allows plants to more effectively utilize nutrients. Air-dried biosolids can be used as a soil amendment or conditioner for establishing turfgrass and for mixing into custom topsoil blends.

EQ Biosolids look and feel like dark, fine-textured topsoil. They can be used on turfgrass at golf courses, athletic fields, parks and other recreational areas, and for restoration of brownfields and other disturbed lands. Better soil and healthier plants require less maintenance and make for more robust and durable landscaping.

EQ Biosolids meet the USEPA's 40 CFR Part 503 requirements for exceptional quality (EQ), which are based on comprehensive risk assessments that are protective of human health and the environment. The regulations establish levels of trace metals and pathogens that are based on scenarios of a person coming into contact with biosolids or food grown on land receiving biosolids. These scenarios include children ingesting biosolids, workers breathing dust while applying biosolids, and homeowners using biosolids in their vegetable gardens.

The Metropolitan Water Reclamation District of Greater Chicago (MWRD) has an exemplary biosolids management program. EQ Biosolids go through an extensive testing regimen to ensure each batch is of the highest quality.

The MWRD has been successfully using EQ Biosolids on golf courses and athletic fields at both public parks and schools in the Chicago area for more than 20 years.

State law prohibits the application of EQ Biosolids on snow-covered or frozen ground. Additionally, EQ Biosolids must be applied in a manner that follows recommended application rates when used on agricultural land, and must be applied in a manner that follows best management practices to protect water quality when used on all other land.

Regulatory Development- In 2015, Illinois Governor Bruce Rauner signed legislation (Public Act 99-0067) that amended the Illinois Environmental Protection Act to recognize biosolids as a safe, beneficial and renewable resource that should be used locally. This legislative amendment also allows composted biosolids to be available to the public.

How To Use EQ Biosolids

Athletic Fields- Topdress athletic fields and other turfgrass areas.

Topsoil Blending- Blend 25-50 percent uniformly with topsoil and spread as needed for establishing turfgrass and landscaping.

Benefits of using biosolids Include:

- Increased infiltration and water holding capacity
- Longer retention of nutrients for better uptake by plants
- Improved topsoil structure and porosity for a better plant root environment

https://mwrd.org/biosolids

EQ Biosolids Analysis*

Parameter	Units	Range	EPA EQ Metal Limits	Parameter	Units	Range	EPA EQ Metal Limits
pH		5.8-6.7		Hg	mg/kg	0.69-0.92	17
Dry Matter	%	60-73		Ni	mg/kg	26-51	420
As	mg/kg	6.0-8.0	41	Pb	mg/kg	81-120	300
Cd	mg/kg	2.0-8.0	39	Se	mg/kg	<5	100
Cu	mg/kg	330-493	1,500	Zn	mg/kg	976-1,237	2,800

*Please see the EQ Biosolids Safety Data Sheet for more information

Ordering EQ Biosolids

- A minimum 10 cubic yard delivery available.
- Limited topdress spreading for 4 acres turfgrass or more available.
- For additional information inquire at biosolids@mwrd.org.

EQ Biosolids Current Applications

EQ Biosolids were used to help transform the roof of an underground parking garage into Maggie Daley Park, a lushly landscaped park and playground in downtown Chicago. The landscape contractor used EQ Biosolids in a blend to make nearly 12,000 cubic yards of custom topsoil. The grass and landscaping is flourishing in spite of heavy use and the park is a popular destination for residents and tourists.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601

ROD R. BLAGOJEVICH, GOVERNOR RENEE CIPRIANO, DIRECTOR

217/782-9802

May 4, 2004

Mr. Richard Lanyon
Director of Research & Development
Metropolitan Water Reclamation District of Greater Chicago
100 E. Erie Street
Chicago, Illinois 60611

Re: Use of Biosolids Related to Site Remediation Program

Dear Mr. Lanyon:

The Agency has reviewed your request regarding the use of biosolids under various scenarios related to sites in the Site Remediation Program (SRP). The following comments are offered:

1. At sites enrolled in the SRP, biosolids may be used as part of an engineered barrier, on top of an engineered barrier, or on top of a remediated soil (i.e. soil meeting the approved remedial objectives) as long as the biosolids, or resultant mixture of soil and biosolids, meet the appropriate remediation objectives for the site. For example, in a residential setting the appropriate objectives would be Tier 1, Tier 2 or Tier 3 residential. The biosolids would also have to be used in a manner consistent with the IEPA Bureau of Water (BOW) permit and any applicable USEPA regulations.
2. At sites that have been issued a No Further Remediation Letter (NFR) by the SRP, biosolids may be used as a soil amendment or soil substitute. If a barrier is in use at the NFR site, the biosolids can still be used on top of the barrier as long as the barrier is not breached or damaged in any way. All biosolids use at NFR sites, with or without barriers, must be used in a manner consistent with the BOW permit and any applicable USEPA regulations.
3. At sites that have no involvement with the SRP, biosolids can be used as a soil amendment or soil substitute in a manner consistent with the BOW permit and any applicable USEPA regulations.

We trust this responds to your questions. Please feel free to contact Larry Eastep if you have any further questions.

Respectfully,

William C. Child

William C. Child, Chief
Bureau of Land

Marcia D. Willhite

Marcia Willhite, Chief
Bureau of Water

WCC:rd\RichardLanyonBiosolids

AN ACT concerning safety.

Be it enacted by the People of the State of Illinois, represented in the General Assembly:

Section 5. The Environmental Protection Act is amended by adding Sections 3.560 and 22.56a as follows:

(415 ILCS 5/3.560 new)

Sec. 3.560. Exceptional Quality biosolids. "Exceptional Quality biosolids" means solids that:

(1) are generated from the advanced processing of publicly-owned sewage treatment plant sludge;

(2) do not exceed the ceiling concentration limits in Table 1 of 40 CFR 503.13 and the pollutant concentration limits in Table 3 of 40 CFR 503.13;

(3) meet the requirements for classification as Class A with respect to pathogens in 40 CFR 503.32(a); and

(4) meet one of the vector attraction reduction requirements in 40 CFR 503.33(b)(1) through (b)(8).

(415 ILCS 5/22.56a new)

Sec. 22.56a. Land application of Exceptional Quality biosolids.

(a) The General Assembly finds that:

(1) technological advances in wastewater treatment

have allowed for the production of Exceptional Quality biosolids that can be used on land as a beneficial recyclable material that improves soil tilth, fertility, and stability and their use enhances the growth of agricultural, silvicultural, and horticultural crops;

(2) Exceptional Quality biosolids are a resource to be recovered; and

(3) the beneficial use of Exceptional Quality biosolids and their recycling to the land as a soil amendment is encouraged.

(b) To encourage and promote the use of Exceptional Quality biosolids in productive and beneficial applications, to the extent allowed by federal law, Exceptional Quality biosolids shall not be subject to regulation as a sludge or other waste if all of the following requirements are met:

(1) The sewage treatment plant generating the Exceptional Quality biosolids maintains the following information with respect to the biosolids:

(A) Documentation demonstrating that the Exceptional Quality biosolids do not exceed the ceiling concentration limits in Table 1 of 40 CFR 503.13 and the pollutant concentration limits in Table 3 of 40 CFR 503.13;

(B) Documentation demonstrating that the Class A pathogen requirements in 40 CFR 503.32(a) are met, including but not limited to a description of how they

were met;

(C) Documentation demonstrating that the vector attraction requirements in 40 CFR 503.33(b)(1) through (b)(8) are met, including but not limited to a description of how they were met;

(D) A certification statement regarding the Class A pathogen requirements in 40 CFR 503.32(a) and the vector attraction reduction requirements in 40 CFR 503.33(b)(1) through (b)(8), as required in 40 CFR 503.17(a)(1)(ii); and

(E) The quantity of Exceptional Quality biosolids sold or given away by the sewage treatment plant each year. The information must be maintained for a minimum of 5 years after the biosolids are generated, and upon request must be made available to the Agency for inspection and copying during normal business hours.

(2) For Exceptional Quality biosolids that have not been bagged:

(A) They are not applied to snow-covered or frozen ground; and

(B) They are used on agricultural land in a manner that follows recommended application rates and are used on all land in a manner that follows best management practices to protect water quality.

(3) If Exceptional Quality biosolids that have not been bagged are generated in another state and imported into

this State, the person importing the biosolids must maintain the information set forth in subparagraph (A) of paragraph (1) of subsection (a) through subparagraph (D) of paragraph (1) of subsection (a) of this Section and the amount of Exceptional Quality biosolids imported each year. The information must be maintained for a minimum of 5 years after the biosolids are imported, and upon request must be made available to the Agency for inspection and copying during normal business hours.

(c) For purposes of this Section, Exceptional Quality biosolids are considered "bagged" if they are in a bag or in an open or closed receptacle that has a capacity of one metric ton or less, including, but not limited to, a bucket, box, carton, vehicle, or trailer.

Section 99. Effective date. This Act takes effect upon becoming law.

Terracon

April 5, 2021

21-72904
0316715228 – Cook
Chicago/City of Chicago/Old City Pound-Green
ERA
SR/TECH

FILE COPY

RECEIVED
APR 05 2021
IEPA/BOL

Illinois Environmental Protection Agency
Bureau of Land
Remedial Project Management Section
Site Remediation Program
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

Attention: Ms. Jenessa N. Conner
P: (217) 524-2084
E: Jenessa.N.Conner@illinois.gov

RE: **Supplemental Remedial Action Plan Information**
650 West 83rd Street
Chicago, Cook County, Illinois
LPC 0316715228—Cook County
Terracon Project No.: A2207015

Dear Ms. Conner:

Terracon Consultants, Inc. (Terracon) is pleased to submit this Supplemental Remedial Action Plan (RAP) Information for the above-referenced site (the site). Per IEPA request, this submittal includes a physical copy and specification sheet for the proposed geotextile to be used in the landscaped engineered barrier area as well as a summary of soil that will be covered by the engineered barrier in the eastern berm area. In addition, new plans for the proposed building require a sump pit to be installed, so information is provided for this feature and measures for sealing the pit that will be required. Terracon conducted this work on behalf of the current site owner and Remediation Applicant (RA), Green Era Educational NFP, Remedial Action Plan Addendum (RAP Addendum) dated January 13, 2020 and IEPA's review letter dated Marcy 2, 2020.

1.0 ALTERNATIVE ENGINEERED BARRIER

Terracon's RAP Addendum included use of an alternative engineered barrier consisting of a geotextile covered by 18 inches of approved clean fill. As previously detailed in the RAP Addendum, the geotextile fabric chosen to cover the east-central berm will be US 100NW-HVO Warning Barrier, manufactured by US Fabrics, Inc. The US 100NW-HVO Warning Barrier is a nonwoven geotextile made up of polypropylene fibers. These fibers are needled to form a stable and durable network such that the fibers retain their relative position. It is non-biodegradable and resistant to most soil chemicals, and

IEPA-DIVISION OF RECORDS MANAGEMENT RELEASABLE
MAY 04 2021
REVIEWER: SAB

has sufficient strength, thickness, and permeability to both prevent exposure to soils remaining in place and allow sufficient drainage to meet civil engineering requirements. The geotextile will also serve as a visual indicator during future construction projects at the Remediation Site. A physical sample of the proposed warning barrier and the specification sheet is included in Appendix A.

2.0 CONTAMINANTS TO BE COVERED BY THE ALTERNATIVE ENGINEERED BARRIER

IEPA requested additional information to indicate the contaminant types, levels, and locations that will be covered by the alternative engineered barrier. Terracon's IEPA-approved CSIR/ROR/RAP dated May 29, 2015 provided this information. Soil exceeding Tier 1 SROs was identified throughout the property. Since mass grading is to occur for the building, pavement, detention pond and other features, this soil is representative of the soil to be placed on the eastern berm area.

Attached Table A presents a summary of soil sample detections for each constituent of concern, as well as average concentration on site, maximum concentration, and whether or not the maximum concentrations identified exceeded applicable Tier 1 SROs for individual exposure routes. This exposure route comparison excluded soil samples B-14(6-8'), B-103(6-8'), B-104(6-8') that were removed from site and disposed at a landfill during the 2020 remedial action to remove soil attenuation exceedances. The remedial work will be documented in the Remedial Action Completion Report. Additionally, it should be noted that in-situ soil mixing performed per the IEPA-Approved RAP, and confirmation samples collected and analyzed for TCLP lead, demonstrated removal of the hazardous concentrations from site.

Per Table A, the soils placed below the engineered barrier may exceed the industrial/commercial ingestion exposure routes, construction worker ingestion and inhalation exposure routes, and soil component to Class I exposure route. Soils previously identified to contain hazardous concentrations of lead and exceeding the attenuation exposure route will not be placed in the berm, nor soils exceeding the industrial/commercial outdoor inhalation. Soil placed in the berm area will meet the requirements for this alternative engineered barrier.

3.0 PROPOSED LOCATION CHANGE FOR PLANNED SUMP SYSTEM

Terracon was made aware that during the building design process, the planned sump pit previously planned to be installed on the exterior of the building is to be moved inside the building. Site investigations did not identify indoor inhalation exceedances on site. Although typically prohibited to help exclude the indoor inhalation exposure route, an indoor sump pit is required for the function of the building due to the requirement for a basement for certain mechanical functions for this facility and high groundwater table at the site. To exclude the indoor inhalation exposure route, the sump pits' interior head space will be passively vented through use of steel or PVC piping extending from the sump and

to the exterior. The pipe terminus will be located a minimum of 10 feet above ground surface and away from building windows, doors, and air intake equipment. Exhibit 3 in Appendix B provides the proposed location of the indoor sump pit and vent routing.

The inside sump pit will be sealed air tight with self-stick gasket, Strip-N-Stick 300 AR, which is a gasket manufactured to seal for water-tight applications. Should silicone caulk or another alternative for sealing be preferred by IEPA, the remediation applicant is amenable. A permanent label will be placed on the sump indicating that it must stay sealed. Appendix B include the specifications for Strip-N-Stick 300 AR for IEPA approval.

4.0 CLOSING

This Supplemental RAP Information is submitted per IEPA request. Upon receipt of the IEPA's approval of this RAP Addendum, Green Era will quickly perform this work at the site. The implementation of this alternative engineered barrier, institutional controls, and the building control technology proposed for the site in the CSIR/ROR/RAP, will be documented in the RACR that will be submitted to the IEPA. Expedient review would be greatly appreciated to prevent construction delay.

If you should have any questions or comments regarding this letter, please contact us at (312) 575-0014.

Sincerely,
Terracon Consultants, Inc.

Andrew Lonergan
Assistant Geologist

Richard O'Brien, P.E.
Senior Environmental Engineer

Cc: Jason Feldman, Green Era Educational NFP

Attachments:

Tables	Soil Analytical Result Summary
Appendix A	Alternative Barrier Supplemental Information
Appendix B	Sump Pit Sealing Information

Tables

Table A - Soil Analytical Result Summary
650 W. 83rd Street
Project: A2207015

Analyte	Units	Remedial Objective Comparison Reference Table by Chemical and Exposure Route							
		Detections	Average Concentration	Maximum Concentration	Industrial/Commercial Ingestion	Industrial/Commercial Inhalation	Construction Worker Ingestion	Construction Worker Inhalation	Class I Groundwater
Volatile Organic Analytical Parameters									
Benzene	mg/kg	6	0.20	0.78	FALSE	FALSE	FALSE	FALSE	TRUE
Xylenes (total)	mg/kg	5	6.3	19	FALSE	FALSE	FALSE	TRUE	FALSE
Semivolatile Organic Analytical Parameters									
Benzo(a)anthracene	mg/kg	80	4.21	77	TRUE	FALSE	FALSE	FALSE	TRUE
Benzo(a)pyrene	mg/kg	79	4.06	73	TRUE	FALSE	TRUE	FALSE	TRUE
Benzo(b)fluoranthene	mg/kg	77	3.60	53	TRUE	FALSE	FALSE	FALSE	TRUE
Benzo(k)fluoranthene	mg/kg	76	3.50	61	FALSE	FALSE	FALSE	FALSE	TRUE
Dibenzo(a,h)anthracene	mg/kg	66	1.31	16	TRUE	FALSE	FALSE	FALSE	TRUE
Indeno(1,2,3-c,d)pyrene	mg/kg	74	1.92	28	TRUE	FALSE	FALSE	FALSE	TRUE
Naphthalene	mg/kg	42	0.86	5.7	FALSE	FALSE	FALSE	TRUE	FALSE
Carbazole	mg/kg	6	0.67	2	FALSE	FALSE	FALSE	FALSE	TRUE
Inorganic Analytical Parameters									
Arsenic	mg/kg	74	10.1	31	TRUE	FALSE	FALSE	FALSE	FALSE
Lead	mg/kg	74	991	33000	TRUE	FALSE	TRUE	FALSE	FALSE
Mercury	mg/kg	53	0.291	1.8	FALSE	FALSE	FALSE	TRUE	FALSE
Antimony	mg/kg	5	210	630	FALSE	FALSE	TRUE	FALSE	FALSE

Notes:

Detections = Number of soil samples detected above laboratory reporting limits.
Maximum Concentration = Maximum soil concentration identified on site.
Average Concentration = Average soil concentration identified on site.
Industrial/Commercial Ingestion = Industrial/Commercial Ingestion Exposure Route Exceedance Identified
Industrial/Commercial Inhalation = Industrial/Commercial Inhalation Exposure Route Exceedance Identified
Construction Worker Ingestion = Construction Worker Ingestion Exposure Route Exceedance Identified
Construction Worker Inhalation = Construction Worker Inhalation Exposure Route Exceedance Identified
Class I Groundwater = Soil Component to Class I Groundwater Exposure Route Exceedance Identified

This exposure route comparison utilized soil data submitted during the IEPA-approved CSIR/ROR/RAP dated March 29, 2015,
but excluded soil samples B-14(6-8'), B-103(6-8'), B-104(6-8') that were removed from site during the 2020 remedial action to remove soil attenuation exceedances.
In-Situ soil mixing performed per the RAP Addendum and confirmation samples collected and analyzed for TCLP lead demonstrated removal of the hazardous concentrations from site.

Appendix A
Alternative Barrier Supplemental Information

LEGEND:

- Remediation Site Boundary
- Retaining Wall
- West Above Grade Inaccessible Area. No Work Planned.

REQUIRED ENGINEERED BARRIERS:

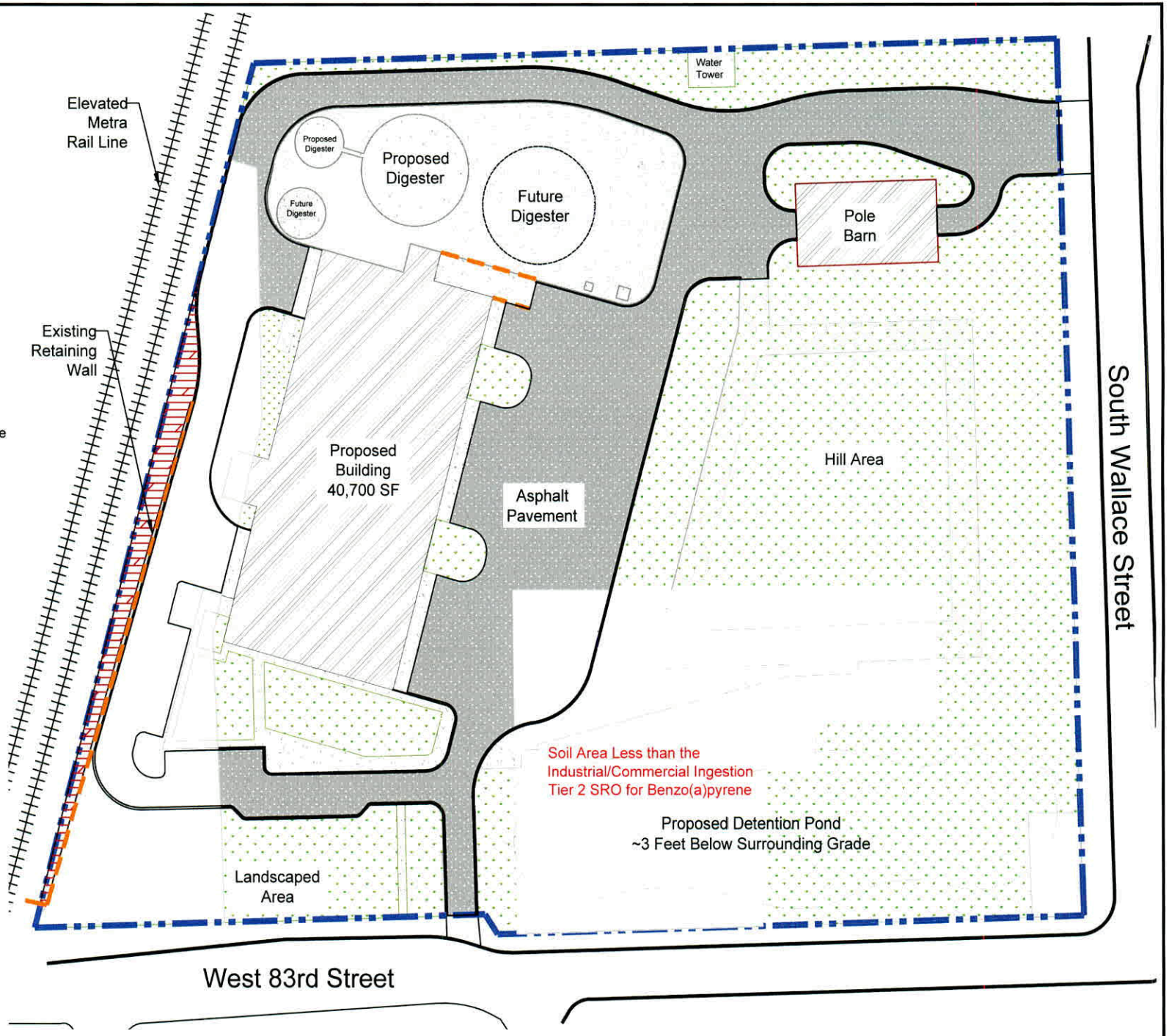
Proposed Landscaped Areas:
Excavate to 18 inches below final grade and replace with geotextile and cover with 18 inches of clean fill.

Proposed Gravel Area:
Excavate to 18 inches below final grade and replace with geotextile and cover with 18 inches of gravel/clean fill.

Heavy Duty Asphalt Pavement and Base

Concrete Pavement/Concrete Pad

Proposed Concrete Building Foundation:
Full concrete building slab will be required for buildings constructed within the property boundary. Sump pits must be sealed air tight with silicone caulk and vented to the building's exterior



N

0 100'

APPROXIMATE SCALE

Project Mngr: RMO	Project No. A2177092
Drawn By: SDM	Scale: AS-SHOWN
Checked By: RMO	Revised By:
Approved By: RMO	Date: December 26, 2019

Terracon
Consulting Engineers and Scientists
650 W. LAKE ST., SUITE 420 CHICAGO, ILLINOIS 60661
PH. (312) 575-0014 FAX. (312) 575-0111

EXTENT OF REQUIRED ENGINEERED BARRIERS

650 WEST 83RD STREET
CHICAGO, COOK COUNTY, ILLINOIS

EXHIBIT 1

LEGEND:

- Remediation Site Boundary
- Retaining Wall
- West Above Grade Inaccessible Area. No Work Planned.
- Area Successfully Treated in 2020 to Remove Soil Exceeding TCLP Hazardous Waste Criteria - Lead
- Approximate Extent of Subsurface Soil Exceeding Attenuation Capacity - **Removed from Site in 2020**

Soil Management Zones:

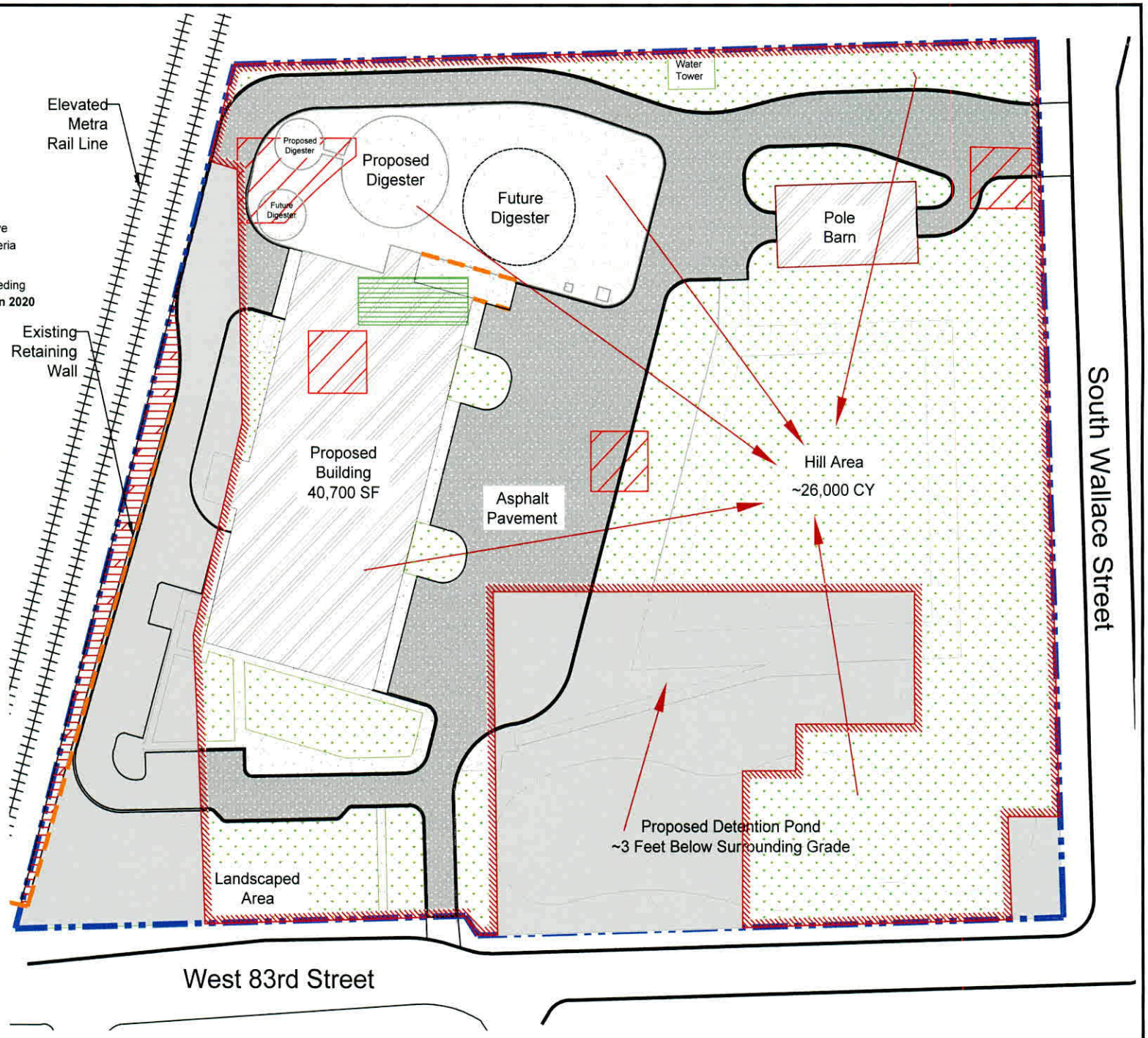
All site soil exceeds TACO Tier 1 Soil Remediation Objectives (SROs) for Soil Component Exposure Route at a minimum. Soil movement cannot take place until hazardous waste lead and attenuation remediation work per the IEPA-approved 2015 CSIR/ROR/RAP is complete.

- Planned Direction of Soil Movement

SMZ 1: Areas with soil less the industrial/ commercial ingestion exposure route ROs where no engineered barriers are required. SMZ 1 soil may be placed under anywhere on site. SMZ 2 soil cannot be placed in SMZ 1 Areas.

SMZ 2: Areas with soil exceeding the industrial/commercial ingestion exposure route ROs where engineered barriers are required. SMZ 2 soil may be relocated under other engineered barriers in other SMZ 2 areas. SMZ 2 soil cannot be placed in SMZ 1 Areas.

1. Soil from areas like pond, buildings, digesters, etc. can be excavated and placed in the east-central hill area.
2. No site soil may be used in the top 18 inches as a clean fill engineered barrier.
3. Excess construction soil and remediation soil, generated within the remediation site boundary to be disposed off-site at an IEPA permitted Subtitle D Landfill.



N

0 100'

APPROXIMATE SCALE

Project Mngr: RMO	Project No. A2177092	Terracon Consulting Engineers and Scientists	SOIL MANAGEMENT ZONE DIAGRAM
Drawn By: SDM	Scale: AS-SHOWN	650 W. LAKE ST., SUITE 420 CHICAGO, ILLINOIS 60661	650 WEST 83RD STREET CHICAGO, COOK COUNTY, ILLINOIS
Checked By: RMO	Revised By:	PH. (312) 575-0014 FAX. (312) 575-0111	EXHIBIT 2
Approved By: RMO	Date: January 17, 2020		

Construction Geosynthetics

US 100NW-HVO Warning Barrier

US 100NW-HVO is a nonwoven, needle-punched, ORANGE warning barrier / contamination barrier geotextile. US 100NW-HVO resists ultraviolet and biological deterioration, rotting, naturally encountered basics and acids. Polypropylene is stable within a pH range of 2 to 13. US 100NW-HVO meets the following typical values:

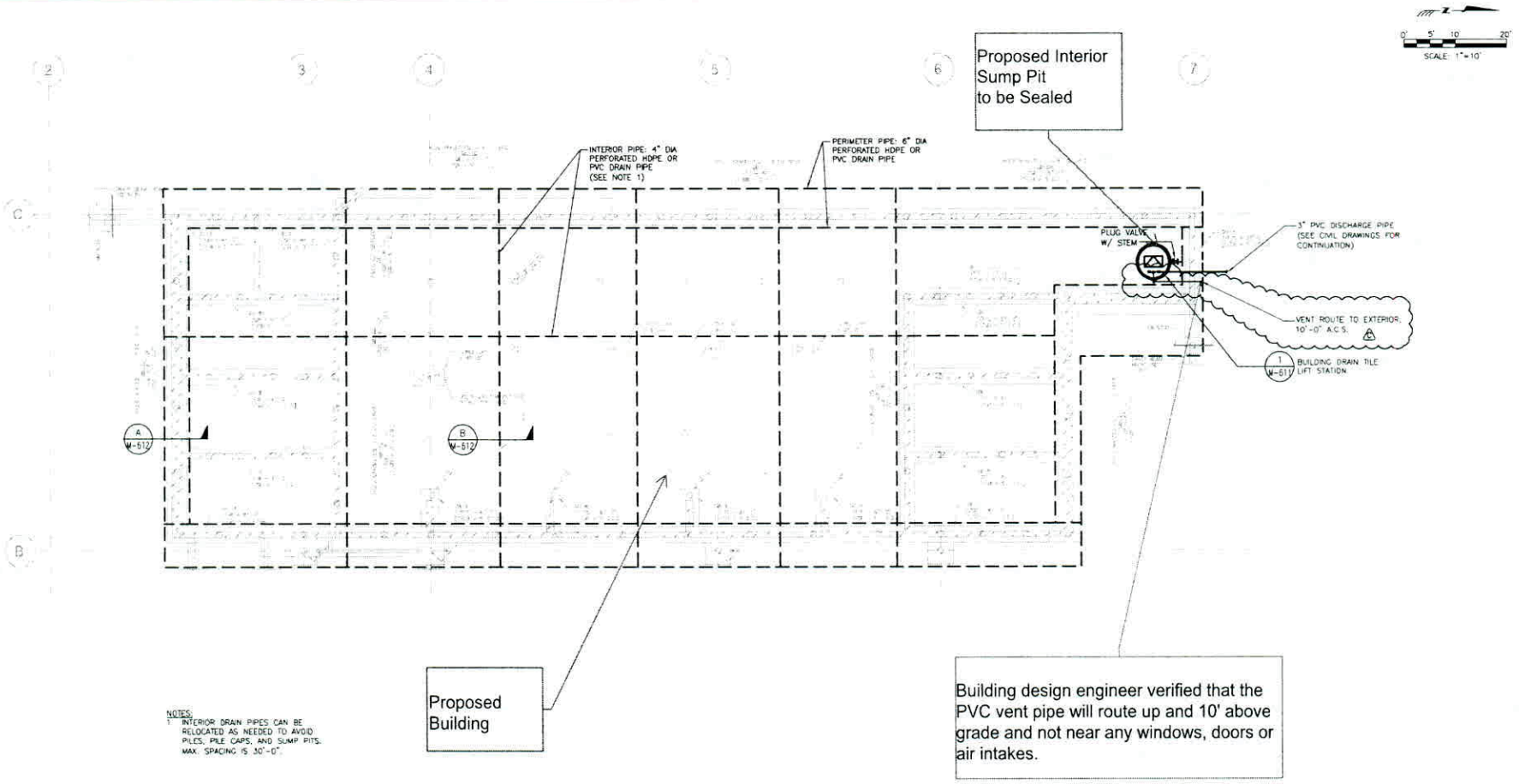
Property	Test Method	English	Metric
Weight	ASTM D-5261	3.8 oz/sy	129 g/sm
Tensile Strength	ASTM D-4632	100 lbs	445 N
Elongation @ Break	ASTM D-4632	75%	75%
Thickness	ASTM D-5199	35 mils	0.90 mm
CBR Puncture	ASTM D-6241	310 lbs	1,380 N
Trapezoidal Tear	ASTM D-4533	50 lbs	223 N
Permittivity	ASTM D-4491	2.40 Sec-1	2.40 Sec-1
Water Flow Rate	ASTM D-4491	175 g/min/sf	7,130 l/min/sm
UV Resistance @ 500 Hours	ASTM D-4355	70%	70%

Roll Size	Roll Diameter	Area	Weight
15' x 360'	13.0 in	600 sys	157 lbs

US Fabrics, Inc. | 3904 Virginia Avenue | Cincinnati, OH 45227
Phone: (800) 518-2290 | Fax: (513) 217-4420 | email: info@usfabrics.com

Terracon

Appendix B
Sump Pit Sealing Information



REV	DATE	BY	DESCRIPTION
5			
4			
3	3-15-21	RAA	ADD LIFT STATION VENT PIPE ROUTE
2	11-6-20	RAA	REVISED BUILDING DRAIN PLAN
1	10-9-20	RAA	ISSUED FOR CONSTRUCTION

SCALE: AS SHOWN
DATE: 10-5-20
DRAWN: JFD
CHECKED: RFC
APPROVED: RAA

ACEng
www.ac-engineering.com
Adams & Christensen Engineering, Inc.
782 Wexford Ct., Grayslake, IL 60030
Illinois Design Firm #184.006676-0002

CLIENT
GREEN ERA SUSTAINABILITY, LLC
ANAEROBIC DIGESTER PROJECT
650 W. 83RD STREET
CHICAGO, IL. 60620

DESCRIPTION
BUILDING LOWER LEVEL DRAIN TILE SYSTEM

EXHIBIT
3

STOCKWELL ELASTOMERICS

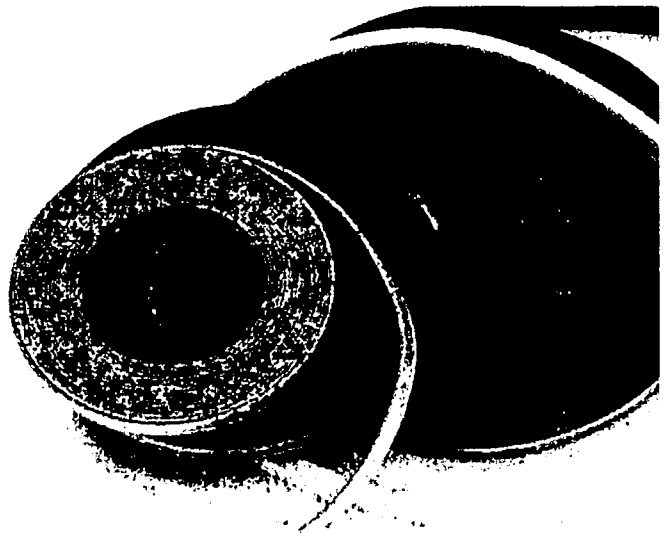
HIGH PERFORMANCE ELASTOMERIC COMPONENTS AND MATERIALS

Gasket Tape – Silicone Sponge and Silicone Foam

What is gasket tape? — Stockwell pre-manufactures master logs of adhesive backed, high performance open cell foams and closed cell sponges, ready to be slit-to-width. Custom cut widths range from 1/4" (6.4mm) up to 34" (863mm) wide. This pre-manufacturing process allows for quick turns to meet short deadlines. The length of the gasket tape / strip gasket depends on the specific product (see chart below). Each product listed below offers a unique solution to gasketing and sealing requirements.

Adhesive Options — Acrylic based adhesives are most widely used, having very good bond strength and good temperature range. Silicone based adhesives have moderate bond strength and a broader operating temperature than acrylics. Acrylic and silicone tapes are available with or without a PET support layer. The supported option consists of a very thin PET layer that is embedded in the adhesive; this gives the gasket tape stability to prevent stretching during installation. Unsupported adhesives are a thin layer of adhesive film applied to the foam; this allows better corner bends.

Custom gasket tape? — Stockwell also manufactures custom gasket tape. Choose one of the foams or sponges and combine with a stock adhesive to develop a custom combination to meet a unique design requirement. Note, custom gasket tape requires a minimum order. Small samples or test swatches are available for test bonding.



Strip-N-Stick® 100S - Medium Firmness, Closed Cell Silicone Sponge with Silicone Adhesive

Medium firmness R-10470-M with an unsupported (transfer) silicone pressure sensitive adhesive. SNS 100S gasket tape is good for water seals and dust seals (e.g. NEMA & IP). This long life silicone sponge gasket tape has excellent long term rebound and is UV resistant. The Low/Medium strength adhesive backing is well suited for extreme temperatures.

Product	Thickness	Firmness	Length	Sponge	Cell Structure	Adhesive	Uses
SNS 100S	0.062 - 0.188" (1.57 - 4.78mm)	Medium	15 or 30ft (3.81 - 7.62m)	R-10470-M	Closed Cell	Silicone Transfer -100 - 500°F (-73 - 260°F) Adhesion: Low	• Silicone Sponge Strip Gasket • High Temp Gasket Tape • Low Temp Gasket Tape • Unsupported Silicone Adhesive • Water Gasket and Dust Gasket • UV Resistant / Outdoor Gasket • Long Service Life • UL Rated for Lighting Fixtures • Orange/Tan

Strip-N-Stick® 200A - Medium Firmness, Closed Cell Silicone Sponge with Acrylic Adhesive

Medium firmness, R-10470-M silicone sponge with an unsupported (transfer) acrylic pressure sensitive adhesive. SNS 200A gasket tape is good for water sealing and dust sealing (e.g. NEMA & IP), where the operating temperatures are not extreme. This long life silicone sponge gasket tape has excellent long term rebound and is UV resistant. The strong acrylic adhesive backing is well suited for bonding to high, medium and some low surface energy substrates.

Product	Thickness	Firmness	Length	Sponge	Cell Structure	Adhesive	Uses
SNS 200A	0.062 - 0.250" (1.57 - 6.35mm)	Medium	15 or 30ft (3.81 - 7.62m)	R-10470-M	Closed Cell	Acrylic Transfer -20 - 300°F (-29 - 149°C) Adhesion: High	• Silicone Sponge Gasket Tape • Unsupported Acrylic Adhesive • Water Gasket and Dust Gasket • UV Resistant / Outdoor Gasket • Long Service Life • Orange/Tan

www.stockwell.com
e-mail: service@stockwell.com
ISO 9001 Registered

Stockwell Elastomerics, Inc.
4749 Tolbut St. Philadelphia, PA 19136-1512 USA
(800) 523-0123 (215) 335-3005 Fax: (215) 335-9433

Strip-N-Stick® 300AR - Reinforced, Closed Cell Silicone Sponge with Acrylic Adhesive

Medium firmness silicone sponge is made with an embedded fiberglass reinforcement which offers exceptional X & Y axis stability (no stretching during install). SNS 300AR has an unsupported (transfer) acrylic pressure sensitive adhesive backing. This gasket tape is good for applications where dimensional stability and higher tensile strength are required. Uses include water seals and dust seals, where the operating temperatures are not extreme. This long life silicone sponge gasket tape has excellent long term rebound and is UV resistant. The strong adhesive backing is well suited for bonding to high, medium and some low surface energy substrates.

Product	Thickness	Firmness	Length	Sponge	Cell Structure	Adhesive	Uses
SNS 300AR	0.062 - 0.125" (1.57 - 3.18mm)	Medium	30ft (7.62m)	R-10450-M (Reinforced)	Closed Cell	Acrylic Transfer -20 - 300°F (-29 - 149°C) Adhesion: High	• Reinforce Gasket Tape • Unsupported Acrylic Adhesive • Water Gasket and Dust Gasket • UV Resistant / Outdoor Gasket • Exceptional X & Y axis stability • Blue/Gray

400FR Gasket Tape - Medium Firmness, UL94V0, Closed Cell Silicone Sponge with Acrylic Adhesive

Medium firmness, R-10400-M flame retardant silicone sponge with an unsupported (transfer) acrylic pressure sensitive adhesive. 400FR Gasket Tape is good for water sealing and dust sealing (e.g. NEMA & IP), in rugged environments. This long life silicone sponge gasket tape has excellent long term rebound, is UV resistant and UL 94V-0 listed. The strong acrylic adhesive backing is well suited for bonding to high, medium and some low surface energy substrates.

Product	Thickness	Firmness	Length	Sponge	Cell Structure	Adhesive	Uses
400FR Gasket Tape	0.062 - 0.250" (1.57 - 6.35mm)	Medium	15 or 30ft (3.81 - 7.62m)	R-10400-M	Closed Cell	Acrylic Transfer -20 - 300°F (-29 - 149°C) Adhesion: High	• Silicone Sponge Gasket Tape • Unsupported Acrylic Adhesive • Water Gasket and Dust Gasket • UV Resistant / Outdoor Gasket • Sponge is UL 94V-0 listed • 21 CFR 177.2600 (food contact) • Dielectric Strength (200 V/mil) • Long Service Life • Blue/Gray

HT-800 Gasket Tape - Medium Firmness, Closed Cell Silicone Foam with Acrylic Adhesive

Modified closed cell silicone foam tape offers excellent long term rebound for critical sealing applications such as indoor or outdoor enclosure gaskets needing to meet NEMA and IP standards. HT-800 silicone foam is UL listed for flame (UL 94V-0) and for several gasket applications including UL 50 and UL 50E periodic recompression.

Product	Thickness	Firmness	Length	Foam	Cell Structure	Adhesive	Uses
HT-800 Gasket Tape	0.062 - 0.250" (1.57 - 6.35mm)	Medium	20 or 30ft (5.08 - 7.62m)	HT800	Modified Closed Cell	Supported Acrylic -40 - 300°F (-40 - 149°C) Adhesion: Medium	• Silicone Foam Gasket Tape • UL Gasket Tape • Supported Acrylic Adhesive • Water Gasket and Dust Gasket • UV Resistant / Outdoor Gasket • HT800 foam is listed for: UL 94V-0, UL 50, UL 50E, UL 508, UL 1570, UL 1572, UL 157 • Meets FAR 25.853 • Gray or Black

Strip-N-Stick® 512 - Very Soft, Open Cell Silicone Foam with Acrylic Adhesive

Very soft open cell silicone foam is good for dust seals, and cushioning, light water mist sealing. SNS 512 has excellent rebound and is UV resistant. The softness of this strip gasket allows for good compression with low clamping force. Testing for suitability in wet applications is recommended due to the open cells.

Product	Thickness	Firmness	Length	Foam	Cell Structure	Adhesive	Uses
SNS 512	0.125 - 0.250" (3.18 - 6.35mm)	Very Soft	15 or 30ft (3.81 - 7.62m)	F-12	Open Cell	Supported Acrylic -40 - 300°F (-40 - 149°C) Adhesion: Medium	• Silicone Foam Gasket Tape • Supported Acrylic Adhesive • Dust Gasket • Cushioning Tape • Foam is UL 94V-0 Listed • Meets FAR 25.853 • Gray

www.stockwell.com
e-mail: service@stockwell.com
ISO 9001 Registered

Stockwell Elastomerics, Inc.
4749 Tolbut St. Philadelphia, PA 19136-1512 USA
(800) 523-0123 (215) 335-3005 Fax: (215) 335-9433

21-72904

0316715228 – Cook
Chicago/City of Chicago/Old City Pound-Green ERA
SR/TECH

Illinois Environmental Protec

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois •

Site Remediation Program Form (DRM-2)

(To be Submitted with all Plans and Reports)

You may complete this form in Acrobat, save a copy, print, sign, and mail it to the address above.

I. Site Identification

Site Name: Proposed Anaerobic Digester Facility

Street Address: 650 West 83rd Street

City: Chicago State: IL Zip Code: 60620 Phone:

Bureau of Land ID Number: 0316715228

II. Remediation Applicant

Applicant's Name: Mr. Jason Feldman

Company: Green Era Educational NFP

Street Address: 218 North Jefferson, Suite 300 P.O. Box:

City: Chicago State: IL Zip Code: 60661 Phone: 312-544-9218

Email Address: jason@greenerapartners.com

I hereby request that the Illinois EPA review and evaluate the attached project documents in accordance with the terms and conditions of the Environmental Protection Act (415 ILCS 5), implementing regulations, and the review and evaluation services agreement.

Remediation Applicant's Signature: Date: 4/5/2021

III. Consultant

Contact's Name: Mr. Richard O'Brien, P.E.

Company: Terracon Consultants, Inc.

Street Address: 650 West Lake Street, Suite 420 P.O. Box:

City: Chicago State: IL Zip Code: 60661 Phone: 312-489-5501

Email Address: rmobrien@terracon.com

IV. Professional Engineer's or Geologist's Seal or Stamp

Documents Submitted

- ☐ Site Investigation Report - Comprehensive
- ☐ Site Investigation Report - Focused
- ☐ Remediation Objectives Report - Tier 1 or 2
- ☐ Remediation Objectives Report - Tier 3
- ☐ Remedial Action Plan
- ☐ Remedial Action Completion Report
- ☐ Sampling Plan
- ☐ Dry Cleaner Trust Fund - Budget
- ☐ Dry Cleaner Trust Fund - Reimbursement Request
- ☑ Other: Supplemental RAP Information

I attest that all site investigations or remedial activities that are subject of this plan(s) or report(s) were performed under my direction, and this document and all attachments were prepared under my direction or reviewed by me, and to the best of my knowledge and belief, the work described in the plan and report has been designed or completed in accordance with the Illinois Environmental Protection Act (415 ILCS 5), 35 Ill. Adm. Code 740, and generally accepted engineering practices or principles of professional geology, and the information presented is accurate and complete.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 Felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Engineer's or Geologist's Name: Richard O'Brien, P.E.

Company: Terracon Consultants, Inc.

Registration Number: 062.059997

Phone: 312-489-5501

License Expiration Date: 11/30/2021

Signature: Richard O'Brien Date: 4/5/21

Note: The authority of a Licensed Professional Geologist to certify documents submitted to the Illinois Environmental Protection Agency for review and evaluation pursuant to Title XVII of the Environmental Protection Act is limited to Site Investigation Reports (415 ILCS 58.7(f), as amended by P.A. 92-0735, effective July 25, 2002. A Licensed Professional Geologist cannot certify to Remediation Objectives Reports, Remedial Action Plans or Remedial Action Completion Reports.

Professional Engineer's or Geologist's Seal or Stamp

ATTACHMENT 7
GEOTECHNICAL ENGINEERING REPORT (OCTOBER 22, 2018)

Terracon GeoReport

Geotechnical Engineering Report – Revision 1

Green Era Biotechnology Plant

Chicago, Illinois

October 22, 2018

Terracon Project No. MR175403R1

Prepared for:

Green Era Educational NFP

Chicago, Illinois

Prepared by:

Terracon Consultants, Inc.

Chicago, Illinois

October 22, 2018

Green Era Educational NFP
218 North Jefferson Street, Suite 300
Chicago, Illinois 60661

Attn: Mr. Jason Feldman

Re: Geotechnical Engineering Report – Revision 1
Green Era Biotechnology Plant
650 West 83rd Street
Chicago, Illinois
Terracon Project No. MR175403R1

Dear Mr. Feldman:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with our proposal number PMR175403R1 dated October 24, 2017 and our subsequent change order dated September 19, 2018. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and floor slabs for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Nathan J. Liggett, P.E.
Project Engineer

Tony A. Kiefer, P.E.
Senior Geotechnical Consultant

REPORT TOPICS

Note: **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the logo in the top right corner will bring you back to this page.

ATTACHMENTS

Geotechnical Engineering Report – Revision 1

Green Era Biotechnology Plant

650 West 83rd Street

Chicago, Illinois

Terracon Project No. MR175403R1

October 22, 2018

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed bio-technology plant to be located at 650 West 83rd Street in Chicago, Illinois. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil (and rock) conditions
- Groundwater conditions
- Site preparation and earthwork
- Dewatering considerations
- Excavation considerations
- Foundation design and construction
- Floor slab design and construction
- Seismic site classification per IBC
- Lateral earth pressures
- Pavement design parameters

The geotechnical engineering scope of services for this project included the advancement of twenty (20) geotechnical borings to depths ranging from approximately 15 to 59 feet below existing site grade. Borings B-1 to B-11 were performed during November 2017. Nine (9) additional borings were then requested following changes to the site layout, resulting in Borings B-12 to B-20 being performed in October 2018.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included in the **Exploration Results** section of this report.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located at 650 West 83rd Street in Chicago, Illinois. See **Site Location**
Existing Improvements	Historically, this site was the location of a former International Harvester manufacturing facility from approximately 1920 to 1940. All former structures have since been demolished. From about 1960 to 2010, the site was utilized as a former Chicago Police Department Impound Lot. The lot is currently vacant.
Current Ground Cover	Gravel/soil/mulch surface. Numerous areas of standing water were observed at the time of our initial field exploration.
Existing Topography	Based upon our site visit and review of the topographic survey, the site is relatively level with surface elevations ranging from +13 to +17 feet (CCD).

PROJECT DESCRIPTION

Our final understanding of the project conditions is as follows:

Item	Description
Project Description	The project will consist of the construction of a new bio-technology plant.
Proposed Development	The structures are anticipated to be constructed in phases, as detailed on the Exploration Plan. Phase 1 will include a high-bay warehouse/office building that will encompass approximately 26,875 square feet (SF), a digester tank (up to 75-foot diameter), a bio-mass tanks (up to 35-foot diameter), and miscellaneous equipment pads. Phase 2 may include a 12,625 SF addition to the high-bay warehouse area and an additional digester and bio-mass tank. Associated pavements, drives, storm water pond, and community green space will also be constructed as required.
Building Construction	It is anticipated that all structures will be steel framed.
Finished Floor Elevation (FFE)	Approximately +18 feet (CCD).
Maximum Loads (verified by MKB)	■ Columns: 250 kips maximum ■ Walls: 4 to 6 kips per linear foot maximum ■ Floor Slabs: 150 pounds per square foot maximum ■ Tank Base Slabs: Up to 3,000 pounds per square foot (psf)

Item	Description
Grading/Slopes	■ The FFE of the proposed building is anticipated to be approximately 2-feet above existing grade. The area of proposed tanks, pavements, and drives is anticipated to have minimal grading. ■ A raised green area extending approximately 5 feet above existing grade to Elev. +21 feet is also planned for a community garden on the east portion of the site. ■ The proposed detention basin at the southeast corner of the site is anticipated to be cut down to Elev. +10 feet, which is approximately 4-feet below existing grade.
Below Grade Structures	None anticipated
Free-Standing Retaining Walls	■ Loading dock walls for the proposed structure is anticipated to be approximately 4½ feet tall. ■ A 5-foot retaining wall may be constructed on the south end of the proposed raised green area to provide an overlook of the detention basin to the south.
Below Grade Areas	None anticipated
Pavements	We assume both rigid (concrete) and flexible (asphalt) pavement sections will be considered.

GEOTECHNICAL CHARACTERIZATION

Subsurface Profile

We have developed a general characterization of the subsurface soil and groundwater conditions based upon our review of the data and our understanding of the geologic setting. The geotechnical characterization forms the basis of our geotechnical calculations and evaluation of site preparation, foundation options and pavement options. As noted in **General Comments**, the characterization is based upon widely spaced exploration points across the site, and variations are likely.

Subsurface conditions at the boring locations can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description	Consistency/Density
1	4 to 7	Urban fill consisting of varying amounts of sand, gravel, clay, brick, wood, and organics	N/A
2	8 to 9	Silty sand (SM)	Loose, wet

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description	Consistency/Density
3	18 to 22	Lean clay (CL)	Soft to medium-stiff Water Content: 21% to 29%
4	40 to 42	Lean clay (CL) to silty clay (CL/ML)	Very stiff to hard Water content: 12% to 16%
5	48 to 50	Silt (ML) and silty clay (CL/ML)	Very dense
6	Below 48 to 50 feet	Dolomite bedrock	Moderate strength, slightly weathered to unweathered

Conditions encountered at each boring location are indicated on the individual boring logs shown in the **Exploration Results** section and are attached to this report. Stratification boundaries on the boring logs represent the approximate location of changes in native soil types; in situ, the transition between materials may be gradual.

Groundwater Conditions

The boreholes were observed while drilling and after completion for the presence and level of groundwater. In addition, a monitoring well (MW-4) was installed adjacent to boring B-4 to allow for long-term readings groundwater levels within the fill. The water levels observed in the boreholes can be found on the boring logs in **Exploration Results**, and are summarized below.

Boring Number	Approximate Depth to Groundwater while Drilling (feet) [1]	Approximate Depth to Groundwater after Drilling (feet) [1]
B-1	1.5	Not obtained due to drilling fluids
B-2	7	Not obtained due to drilling fluids
B-3	2	Not obtained due to drilling fluids
B-4 (MW-4)	1.5	2 (after drilling) 5.5 (on 12/8/2017)
B-5	1.5	3
B-6	2.5	8
B-7	3.5	7
B-8	2	8
B-9	2	6
B-10	2.5	7
B-11	2.5	4
B-12	9	20

Boring Number	Approximate Depth to Groundwater while Drilling (feet) [1]	Approximate Depth to Groundwater after Drilling (feet) [1]
B-13	None encountered prior to addition of drilling fluid	Not obtained due to drilling fluids
B-14	6	15
B-15	11	Not obtained due to drilling fluids
B-16	11	20
B-17	8	11
B-18	11.5	8
B-19	7	Not obtained due to drilling fluids
B-20	7	17

1. Below ground surface

At the time of the initial field exploration (Borings B-1 to B-11) between November 27th and 29th, 2017, standing water was present at the surface across most of the site. An additional site visit was performed by a Terracon field engineer to obtain a water level reading in MW-4 on December 8, 2017. At the time of this additional site visit, standing water was not observed on the site.

Subsequent borings (B-12 to B-20) were performed in October 2018. At the time of this subsequent exploration, standing water was not present at the site.

As such, Terracon believes that the standing water present during the initial drilling operations was the result of a perched water above the fill, which subsequently infiltrated into the ground prior to the additional work. Terracon recommends a long-term groundwater level of 5 feet below existing grade.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

GEOTECHNICAL OVERVIEW

The near surface, clayey fill could become unstable with typical earthwork and construction traffic, especially after precipitation events. If possible, the grading should be performed during the warmer and drier time of the year. If grading is performed during the wetter months, there may be an increased risk for possible undercutting and replacement of unstable subgrade. Additional site preparation recommendations including subgrade improvement and fill placement are provided in the **Site Preparation** section.

The **Shallow Foundations** section addresses support of the building(s) bearing on native medium-stiff lean clay or engineered fill extending to native lean clay. Shallow foundations supporting column loading up to 100 kips can be proportioned for a net allowable bearing pressure of 2,500 psf when bearing on a minimum 3-foot thick layer of compacted engineered fill. New engineered fill must extend below the existing undocumented fill. Footings supported directly on the medium-stiff lean clay or lean concrete extending to the native lean clay can be proportioned for a net allowable bearing pressure of 1,500 psf.

For column loadings greater than 100 kips, alternate foundation support will need to be considered due to the greater zone of influence resulting from the larger footing sizes. Consideration could be given to improving sub-grade in place with rammed aggregate piers, as noted in the **Specialty Foundations** section. Alternatively, these foundations could also be supported on belled drilled shafts or auger-cast piles (ACIPs), as discussed in the **Deep Foundations** section.

The digester tanks and bio-mass tanks should not be supported directly on the medium-stiff clay or engineered fill. We recommend that these structures be supported on a structural mat bearing on an improved subgrade consisting of aggregate piers, as noted in the **Specialty Foundations** section. Alternatively, these structures could also be supported on a series of belled drilled shafts or auger-cast piles (ACIPs) structurally connected to the tank mat foundation, as discussed in the **Deep Foundations** section.

Floor slabs may be grade supported provided that certain measures are taken, and assuming that the site grades will not be raised. Any organic, soft, or loose material should be removed from the proposed area. The newly exposed subgrade should then be proofrolled as detailed in the **Earthwork** section. Any areas exhibiting excessive rutting or deflection should be undercut and replaced with compacted engineered fill. Following proofrolling, we recommend that a minimum 6-inch thick granular leveling course be placed directly below the slab to provide uniform support.

Support of floor slabs and pavements on or above existing fill materials is discussed in this report. However, even with the recommended construction procedures, there is an inherent risk for the owner that compressible fill or unsuitable material within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but can be reduced by following the recommendations contained in this report. To take advantage of the cost benefit of not removing the entire amount of undocumented fill, the owner must be willing to accept the risk associated with building over the undocumented fills following the recommended reworking of the material.

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

Earthwork will include clearing and grubbing, excavations and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria as necessary to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

Site Preparation

Prior to placing new fill, any organic matter or otherwise unsuitable material should be removed from the site limits. Following stripping of surface materials and prior to placing new engineered fill, the exposed soils should be observed and tested by Terracon. A Terracon representative should observe proofrolling of the exposed soils. Proofrolling can be accomplished using a loaded tandem-axle dump truck with a gross weight of at least 25 tons, or similarly loaded equipment. Areas that display excessive deflection (pumping) or rutting during proofroll operations should be improved by scarification/compaction or by removal and replacement with engineered fill.

All existing utilities, if present, should also be properly abandoned and/or relocated. This should include removal of all poorly compacted trench backfill extending into the proposed building area. In addition, care should be taken by contractors to protect all existing improvements to remain, such as pavements and utilities. Excavations created by demolition and removal of existing features should be backfilled with engineered fill that is placed and compacted as recommended in this report.

Existing Fill

As noted in **Geotechnical Characterization**, existing fill to depths ranging from about 4 to 7 feet. The fill appears to have been placed in an uncontrolled manner. Support of floor slabs and pavements on or above existing fill soils is discussed in this report. However, even with the recommended construction procedures, there is an inherent risk for the owner that compressible fill or unsuitable material within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but can be reduced by following the recommendations contained in this report.

Fill Material Types

It is expected that most of the inorganic sandy or cohesive site soils located below the fill material are too soft and wet to be useful as site fill material. Excessive drying or reworking would be needed to use existing site soils. Engineered fill for the project should meet the following material property requirements:

Fill Type [1, 2]	USCS Classification	Acceptable Locations for Placement
Cohesive	CL [3], CL/ML [3], ML [3] (LL ≤ 45 and PI ≤ 20)	Adjacent to footings Below/adjacent to floor slabs and pavement
Granular	GW, GP, GM, GC SW, SP, SM, SC	Below/adjacent to footings, floor slabs, and pavement
Unsuitable	CL/CH [4], CH [4], MH [4], OL, OH [4], PT	non-structural locations

1. Engineered fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to Terracon for evaluation prior to use on this site.
2. Any organic materials, rock fragments larger than 3 inches, and other unsuitable materials should be removed prior to use as engineered fill.
3. These materials can be highly susceptible to frost heave and are unstable when wet, yet are commonly used for pavement support with the knowledge that additional maintenance and/or shorter pavement life are likely.
4. High plasticity. Not recommended beneath movement sensitive features such as foundations, floor slabs, or pavements.

Fill Compaction Requirements

Engineered fill should meet the following compaction requirements.

Item	Description
Maximum fill lift thickness	■ 9 inches or less in loose thickness when heavy, self-propelled compaction equipment is used ■ 6 inches or less in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used
Minimum compaction requirements [1, 2, 3]	■ 95% of the modified Proctor (ASTM Standard D-1557) maximum dry density below foundations and within 1 foot of finished pavement subgrade elevation; the compaction effort should extend laterally beyond the foundations at least 8 inches for every foot of fill placed below the foundation elevation ■ 92% below floor slabs, and more than 1 foot below finished pavement subgrade
Moisture content range [1]	■ within 2% below to 4% above the modified Proctor optimum moisture content at the time of placement and compaction ■ granular materials should be compacted within workable moisture levels

Item	Description
1.	We recommend that engineered fill be tested for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.
2.	If the granular material is a coarse sand, crushed limestone, or gravel, is of a uniform size, or has a low fines content, compaction comparison to relative density (ASTM D 4253 and D 4254) may be more appropriate. In this case, granular materials should be compacted to at least 60% and 65% of the maximum relative density for the 92% and 95% modified Proctor recommendations, respectively.
3.	Specifically, moisture levels should be maintained to achieve compaction without bulking during placement or pumping when proofrolled.

Utility Trench Backfill

For low permeability subgrades, utility trenches are a common source of water infiltration and migration. Utility trenches penetrating beneath the building should be effectively sealed to restrict water intrusion and flow through the trenches, which could migrate below the building. The trench should provide an effective trench plug that extends at least 5 feet from the face of the building exterior. The plug material should consist of cementitious flowable fill or low permeability clay. The trench plug material should be placed to surround the utility line. If used, the clay trench plug material should be placed and compacted to comply with the water content and compaction recommendations for structural fill stated previously in this report.

Grading and Drainage

During construction, grades should be developed to direct surface water flow away from or around the site. Exposed subgrades should be sloped to provide positive drainage so that saturation of subgrades is avoided. Surface water should not be permitted to accumulate on the site.

Final grades should slope away from the building to promote rapid surface drainage. Accumulation of water adjacent to the building could contribute to significant moisture increases in the subgrade soils and subsequent softening/settlement. Roof drains should discharge into a storm sewer or several feet away from the building.

Earthwork Construction Considerations

We recommend that a Terracon geotechnical engineer or qualified representative be retained during the construction phase of the project to observe earthwork and to perform necessary tests and observations during stripping of topsoil, subgrade preparation, placement and compaction of controlled compacted fills, backfilling of excavations, and just prior to construction of building floor slabs.

Upon completion of filling and grading, care should be taken to maintain the moisture content of the subgrade soils prior to construction of floor slabs. The site should also be graded to prevent

ponding of surface water on the prepared subgrades or in excavations. Any water that collects over or adjacent to construction areas should be promptly removed. If the subgrade should become frozen, desiccated, saturated, or disturbed, the affected material should be removed or these materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction and observed by Terracon.

Care should be taken to avoid disturbance of prepared subgrade soils. The near surface native and existing fill soils have elevated moisture contents, and are very easily disturbed, especially by construction traffic. Construction traffic should not operate directly on saturated or low strength soils. If the subgrade becomes saturated, desiccated, or disturbed, the affected materials should either be scarified and compacted, or be removed and replaced as previously discussed. Subgrades should be observed and tested by Terracon prior to construction.

Excavations for footing foundations (if utilized) is expected to extend below the upper fill materials and bear on the native silty sand or medium-stiff clay encountered between 7 and 8 feet below grade. Based on conditions encountered at the boring locations, excavations for footing foundations are likely to encounter the water table. If seepage is encountered, the contractor is responsible for employing appropriate dewatering methods to control seepage and facilitate construction. In our experience, dewatering of excavations one to two feet below the water table can typically be accomplished with sump pits and pumps. Groundwater levels should be maintained at least 2-feet below the base of excavation during construction. However, if large amounts of water infiltration is encountered, extensive dewatering efforts consisting of multiple well points may be required. Alternatively, a groundwater cut-off consisting of interlocking steel sheet piling embedded into the underlying clay could be utilized. The steel sheet piling could also function as a temporary earth retention system for the excavation, if desired.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, “Excavations” and its appendices, as well as other applicable codes, and in accordance with any applicable local, state, and federal safety regulations. The contractor should be aware that slope height, slope inclination, and excavation depth should in no instance exceed those specified by these safety regulations. The existing fill and native soils in the upper 20 feet of the soil profile are considered Type “C” soils under the OSHA regulations. Maximum slope inclinations for Type “C” soils under the OSHA regulations is 1.5H:1V. Flatter slopes than those dictated by these regulations may be required depending upon the soil conditions encountered and other external factors. These regulations are strictly enforced and if they are not followed, the owner, the contractor, and/or earthwork and utility subcontractor could be liable and subject to substantial penalties. Under no circumstances should the information provided in this report be interpreted to mean that Terracon is responsible for construction site safety or the contractor’s activities. Construction site safety is the sole responsibility of the contractor who shall also be solely responsible for the means, methods, and sequencing of the construction operations.

SHALLOW FOUNDATIONS

It is our opinion that relatively lightly loaded structures (column loading less than 100 kips) can be supported on spread foundations bearing on the native medium-stiff lean clay soils encountered between 7 and 9 feet below existing grade, or on engineered soil fill or lean concrete extending to suitable native bearing soils.

The footings should not be supported on the existing fill materials due to the lack of documentation available regarding the placement/compaction methods used for these soils and the variability observed in the field test data. The foundations will need to be extended through the undocumented fill and supported on the native medium-stiff lean clay. The footings could then be supported at this lower elevation, or the undercut could be backfilled to the design footing elevation with engineered soil fill or lean concrete.

For column loadings greater than 100 kips, alternate foundation support will need to be considered due to the greater zone of influence resulting from the larger footing sizes. Consideration could be given to improving sub-grade in place with rammed aggregate piers, as noted in the **Specialty Foundations** section. Alternatively, these foundations could also be supported on belled drilled shafts or auger-cast piles extending to the very stiff to hard lean clay encountered below approximately 20 feet, as discussed in the **Deep Foundations** section.

The digester tanks and bio-mass tanks should not be supported directly on the medium-stiff clay or engineered fill. We recommend that these structures be supported on a structural mat bearing on an improved subgrade consisting of aggregate piers, as noted in the **Specialty Foundations** section. Alternatively, these structures could also be supported on a series of belled drilled shafts or auger-cast piles extending to the very stiff to hard lean clay encountered below approximately 20 feet and structurally connected to the tanks mat foundation, as discussed in the **Deep Foundations** section.

Design Parameters

Item	Description
Maximum Net Allowable Bearing pressure [1, 2, 6]	**1,500 psf –** (foundations bearing directly on the medium-stiff native clay or sand or lean concrete extending to native soils.) **2,500 psf –** (foundation bearing on at least 3 feet of granular engineered fill extending down to the native sand or clay.)
Minimum Foundation Dimensions	Columns: 30 inches Continuous: 18 inches

Item	Description
Ultimate Coefficient of Sliding Friction [3]	0.35 (cohesive material) 0.45 (granular material)
Minimum Embedment below Finished Grade [4]	3.5 feet
Estimated Total Settlement from Structural Loads [2, 5]	Approximately 1 inch
Estimated Differential Settlement [5]	About 2/3 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. These bearing pressures can be increased by 1/3 for transient loads unless those loads have been factored to account for transient conditions.
2. Assumed final site grade is not raised more than 2 feet from existing conditions.
3. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions.
4. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure. Interior footings in heated structures can be supported at a higher elevation.
5. Foundation settlements will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of engineered fill, and the quality of the earthwork operations and footing construction, frequent control joints should be provided for walls.

Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils. A maximum total unit weight of 120 pcf should be used for the backfill. This unit weight should be reduced to 60 pcf for portions of the backfill or natural soils below the groundwater elevation.

Foundation Construction Considerations

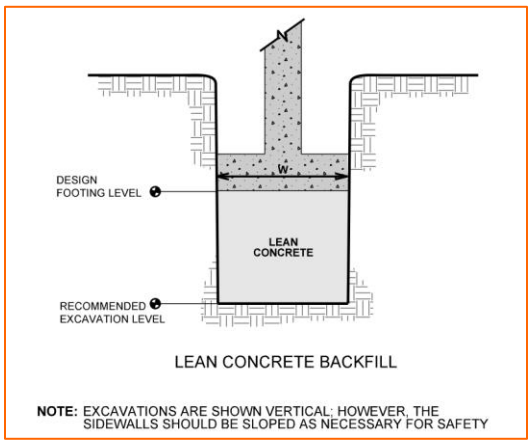
Foundations extended below the fill material will encounter the shallow perched water level. Thus, construction difficulties will result requiring dewatering. Also, the loose saturated sand below the fill material will be highly susceptible to disturbance. Thus, it is likely that this thin, water-bearing layer would need to be removed to extend new fill to the underlying medium clay surface. The medium clay is also highly susceptible to disturbance; thus vehicle traffic should not occur on the exposed subgrade.

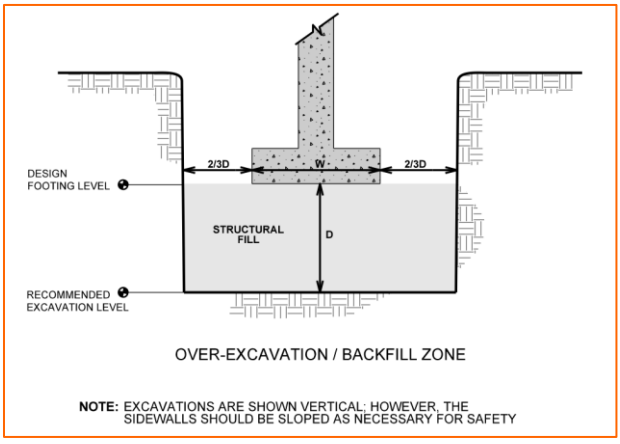
The soils at the base of each foundation excavation should be observed and tested by Terracon to evaluate whether they meet the requirements for suitable bearing soils as defined in this report. The excavations should be probed or otherwise sampled at regular intervals.

The base of each foundation excavation should be free of water and loose materials prior to placing concrete. Concrete should be placed as soon after excavating as possible to reduce

bearing soil disturbance. If the soils at the bearing level become excessively dry, disturbed, saturated, or frozen, the affected soil should be removed prior to placing concrete. Placement of a lean concrete mud-mat over the bearing soils should be considered if the excavations must remain open overnight or for an extended period of time.

Footings should bear directly on tested and approved native lean clay or sand soils or on new engineered granular fill extending a minimum of three feet below the proposed footing bearing elevation. If unsuitable soils are encountered at the design footing level, the footing excavations should be extended deeper to reach suitable bearing materials.
Where engineered fill will be placed to support the footings, the excavations should be widened at least 8 inches beyond each footing edge for every foot of new fill placed below the design footing base elevation. The overexcavated depth should then be backfilled up to the foundation base elevation with an approved fill material that is placed in lifts and compacted to at least 95% of the modified Proctor maximum dry density. We recommend that backfill materials consist of those materials identified in the **Earthwork** section. The recommended extents of the over-excavation and backfill procedure are illustrated in the following figures.





AGGREGATE PIERS

Heavily loaded columns and the large tank foundations could also be supported on typical shallow foundations (spread footings or structural mat) bearing over a system of aggregate piers. Aggregate piers are an intermediate design-build soil reinforcement system that is commonly used to support structures as an alternative to soil over-excavation. The system allows the use of conventional spread footings or large mat slabs bearing at typical frost depth, and typically provides settlement control to within 1-inch or less.

Aggregate piers are installed by densifying lifts of aggregate into a cavity that is created by either drilling or displacement methods. Densification takes place with a high-energy beveled tamper

or vibratory probe that both densifies the aggregate and forces the aggregate laterally into the sidewalls of the hole. This action increases the lateral stress in surrounding soil, thereby further stiffening the stabilized composite soil mass. The result of aggregate pier installation is a significant strengthening and stiffening of subsurface soils that then support the mat slabs and conventional shallow spread footings. We recommend that the individual aggregate pier elements extend through the existing fill and soft to medium-stiff lean clay soils encountered in the upper 20 feet of the soil profile and terminate in the underlying very stiff to hard native clay and silty clay. The use of the displacement or drilling method is at the discretion of a design-build aggregate pier contractor.

Aggregate pier designs are based on a two-layer settlement analysis. Settlements within the "upper zone" (zone of soil that is reinforced with aggregate pier elements) are computed using a weighted modulus method that accounts for the stiffness of the aggregate pier elements, the stiffness of the matrix soil, and the area coverage of aggregate pier elements below supported footings. Settlements within the "lower zone" (zone of soils beneath the upper zone which receives lower intensity footing stresses) are computed using conventional geotechnical settlement methods.

After reinforcement with the aggregate pier system, the building foundations may be designed as a conventional spread footing, sized for an allowable bearing pressure on the order of 4,000 psf. The above estimate should be considered preliminary and is based on our past experience with aggregate pier systems in similar soils. The allowable bearing pressure will vary depending on the size, installation methods and spacing of the individual piers. Thus, the actual allowable bearing pressure used in footing design should be developed by an experienced design-build aggregate pier contractor based on the actual pier geometry to be used for construction. We are able to provide a list of qualified aggregate pier design-build contractors at your request.

If the aggregate pier system is selected, quality assurance testing should be performed during installation, including documentation of the soil conditions encountered, the shaft lengths, amount of aggregate used, and tests on the completed aggregate pier elements. Terracon can provide these services if requested.

DEEP FOUNDATIONS

Belled Caisson Design Parameters

Based on the information obtained from the borings, a maximum net allowable end bearing pressure of 15,000 pounds per square foot (psf) can be used for belled caissons bearing in the hard silty clay soils in the depth range of a 25 to 30 feet below existing grade. Belled caissons should not extend below 35 feet due to the underlying granular soils that could be encountered.

The maximum net allowable soil bearing pressure is that pressure which may be transmitted to the foundation soils in excess of the minimum surrounding overburden pressure.

The design bearing capacity values may be increased by 1/3 for intermittent loading such as wind and seismic loads. Per the City of Chicago Building Code, caisson side friction is not allowed for design of belled caissons designed for end bearing in the hardpan.

To resist tension forces, caissons can be designed to include full length, tied reinforcement to the bottom of the bell. Uplift resistance can be determined using one of the following two methods:

1. By computing the buoyant unit weight of the combined caisson and soil cylinder equal to the bell diameter multiplied by the caisson length.

2. By computing the soil shear strength mobilized on a cylinder equal to the bell diameter to the height of the bell and adhesion between the soil and the concrete along the shaft above the top of the bell plus the buoyant weight of the caisson concrete.

For uplift design purposes, average ultimate values of 500 psf can be assumed for the shear resistance between depths of 5 to 20 feet, and 1,500 psf below a depth of 20 feet. Shear resistance above a depth of 5 feet should be ignored due to disturbance from frost and construction activities. The caisson uplift capacity, to resist transient loads such as wind or seismic loading, should be based on a factor of safety of at least 1.5. A minimum factor of safety of 2.0 should be used for permanent loading conditions.

Belled shafts may be spaced so that the minimum distance between bell edges are at least one foot. A minimum shaft diameter of 30 inches should be used. Foundation elements at a structure's perimeter and below any unheated areas, such as grade beams and pile caps, should extend at least 3½ feet below grade for frost protection. A minimum shaft diameter of at least 30 inches is recommended. The caisson bells should have a base angle no flatter than 60 degrees from the horizontal and the bell diameter should not exceed three times the shaft diameter.

Post-construction settlements of drilled shafts designed and constructed as described in this report are estimated to be approximately ½ inch. Differential settlement between individual shafts is expected to be ½ to ⅔ of the total settlement.

Drilled Shaft Construction Considerations

To limit the potential problems with drilled shaft installation, we recommend that an experienced drilled shaft technician with Terracon be on site to make decisions on the belling elevation. To limit problems, caissons should be completed and poured as quickly as possible with concrete waiting on site as the bell is completed.

We recommend temporary casing be used when the drilled shafts are installed through the existing fill materials encountered to depths of approximately 9 feet below grade. Temporary casing would need to extend a few feet into the underlying native lean clay to create a seal against soil caving and possible ground water seepage.

Soft clay was found at the site typically in the depth range of about 10 to 20 feet below grade. Our experience has shown that clay squeeze is a concern when water content exceeds 30 percent. Based on the results of our field and laboratory testing, squeeze is not anticipated to occur for shaft diameters less than 3.5 feet.

If significant sand seams or water-bearing silt seams are encountered at the bell elevation, the shaft may have to be extended deeper below this zone to facilitate belling. Uncased shaft excavations should not be allowed to remain open overnight. Bells should not extend below 35 feet in depth so that the possibility of water infiltration from the lower silt layers is reduced.

Drilled shaft cut-offs are expected to be within the temporary casing within fill soils at this site. As a result, after the bell is excavated and the bearing is approved by a representative of Terracon, we recommend that a permanent corrugated liner be installed in the shaft to a depth of about 2 feet below the casing. The corrugated liner should fit tightly into the clay and extend up to the cut-off elevation. The corrugated liners should have the same diameter as the design size of the shaft. Concrete may be poured by free-fall into clean and dry excavations (less than 2 inches of standing water) inside the corrugated liner. After the concrete has set for a day, the annular space between the corrugated liner and temporary casing should be filled with sand/cement grout and the casing should then be pulled. Free-fall concrete should have a slump in the range of 5 to 7 inches.

Alternatively, for caisson cut-offs near the ground surface within the clayey fill material and above the perched water table, the “pour and pull” procedure may be used. In this procedure, the concrete slump should be increased to 7 to 9 inches and the top of concrete must be carefully monitored to ensure the concrete surface does not rise as the casing is pulled.

We recommend that all belled drilled shaft construction be observed on a full-time basis by a Terracon representative to check that the soils encountered are consistent with the recommended design parameters. The drilled shaft contractor should also be required to submit proposed installation procedures, past projects of a similar nature, a resume of their superintendent, and a complete list of equipment that will be used on the job. It is recommended that these procedures and equipment list be submitted to the owner and design team so that they can be reviewed and approved at a pre-bid meeting held in advance of bidding and award of the contract.

Although not encountered in the borings, shallow obstructions may be encountered during construction. The contractor should be prepared to deal with buried concrete, debris, or other

types of obstructions while drilling for caissons. Depending on the size, depth, and thickness of obstruction, construction delays can occur and therefore, appropriate contingencies for costs should be planned. Pot-holing at each caisson location in advance of caisson construction is recommended to confirm that the locations are clear of shallow obstructions.

Augered and Cast-in-Place (ACIP) Pile Design Parameters

Auger-cast piles are installed by continuous flight augering into the overburden soil utilizing a hollow-stem auger with typical diameters varying from 12 to 22 inches. Larger diameters up to 48 inches are also available locally by some contractors. Upon reaching the required depth, grout is pumped through the center of the auger as the auger is turned and withdrawn, resulting in a continuous column of cement grout. Reinforcement of auger-cast piles is achieved by immersing a vertical reinforcement bar or cage into the center of each pile, while the grout is still fluid.

Auger-cast piles extended to bedrock at an approximate depth of 50 feet below grade can be designed to the structural capacity of the grout. A 12-inch diameter pile is likely to develop load carrying capacities on the order of 70 tons per pile. A 14-inch diameter pile can develop load carrying capacities on the order of 90 tons per pile. An 18-inch diameter pile can develop load carrying capacities on the order of 150 tons per pile. These design load values assume a minimum of 5,000 psi grout and a factor of safety on concrete strength of at least 4.0. Settlement of auger cast piles supported entirely on the rock is expected to be less than ½ inch. This settlement does not include the elastic compression of the cement grout.

Auger cast piles with lateral dimensions less than 24 inches should be used in pile groups of at least three piles if lateral restraint is not provided by other means like walls or grade beams. The minimum pile spacing should be 2.5 times of the pile diameter.

ACIP Construction Considerations

Installation of adjacent piles with a clear distance spacing of less than ten pile diameters should be delayed until grout in the initial pile has set. This is required to avoid possible grout intrusion between the piles, which could jeopardize pile integrity.

Proper installation of ACIPs is highly operator dependent, and require a greater than average dependence on quality workmanship and quality control monitoring. In addition, the successful completion of ACIPs largely depend on the equipment and installation procedures. The auger should be withdrawn in a controlled manner and a sufficient head of grout should always be maintained in the augers, to prevent necking of fluid grout due to hydrostatic pressures.

If practical drilling refusal is experienced above the planned termination depth, then a boulder or other obstruction may be present, and a replacement pile should be installed. If this occurs, the situation should be evaluated by the Geotechnical Engineer and the Structural Engineer during

the pile driving operations. Continued "hard" drilling to attempt to extend through an obstruction should not be performed, due to the possibility of excessive soil removal.

If the ACIP system is selected, quality assurance testing should be performed during installation, including documentation of the soil conditions encountered, the shaft lengths, amount of grout used, and strength tests on the grout. Only contractors using equipment with Automated Monitoring Equipment (AME) should be used to monitor the grout installation and provide a record of the as-built installation depth, torque, drill speed, grout pressure and volume. One ACIP should be load tested to check that the expected capacity or modulus is achieved. We recommend that at least 25 percent of the ACIP piles be checked for integrity with the Impulse-Response Method Pile Integrity Test. Terracon can provide these services if requested.

Deep Foundation Lateral Loading

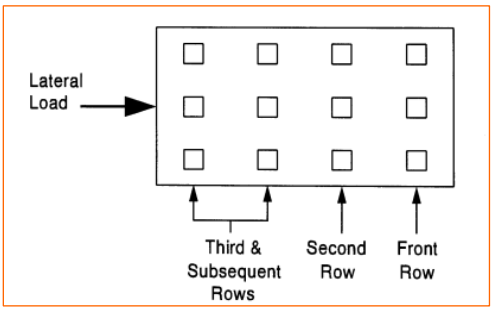
The following table lists input values for use in LPILE analyses of drilled shafts and ACIP piles. LPILE will estimate values of k_h and E_{50} based on strength; however, non-default values of k_h should be used where provided. Since deflection or a service limit criterion will most likely control lateral capacity design, no safety/resistance factor is included with the parameters.

Elevation (feet, CCD) [1]	L-Pile Soil Model	S_u (psf) [2]	ϕ [2]	γ (pcf) [2, 3]	ε_{50} [2]	K [2] (pci)
Above +9	Sand (Reese)	---	28°	115	---	5
+6 to +9	Sand (Reese)	---	30°	115	---	5
-4 to +6	Soft Clay	500	---	125	0.020	---
Below -4	Stiff Clay w/o Free Water	4,500	---	135	0.004	2,000

1. See **Subsurface Profile** in **Geotechnical Characterization** for more details on Stratigraphy.
2. Definition of Terms:
   S_u: Undrained shear strength
   ϕ: Internal friction angle,
   γ: Moist unit weight.
   ε_{50}: Non default E50 strain
3. Buoyant unit weight values should be used below water table. This can be calculated by subtracting 62 pcf from the moist unit weight values.

When deep foundations are used in groups, the lateral capacities of the shafts in the second, third, and subsequent rows of the group should be reduced as compared to the capacity of a single, independent founation. Guidance for applying p-multiplier factors to the p values in the p-y curves for each row of pile foundations within a pile group are as follows:

- Front row: P_m = 0.8;
- Second row: P_m = 0.4
- Third and subsequent row: P_m = 0.3.



For the case of a single row of shafts supporting a laterally loaded grade beam, group action for lateral resistance of shafts would need to be considered when spacing is less than three shaft diameters (measured center-to-center). However, spacing closer than 3D (where D is the diameter of the foundation element) is not recommended, due to potential for the installation of a new foundation element disturbing an adjacent installed foundation, likely resulting in axial capacity reduction.

FLOOR SLABS

Floor slabs may be grade supported provided that certain measures are taken, and assuming that the site grades will not be raised. Any organic, soft, or loose material should be removed from the proposed area. The newly exposed subgrade should then be proofrolled as detailed in the **Earthwork** section. Any areas exhibiting excessive rutting or deflection should be undercut and replaced with compacted engineered fill. Following proofrolling, we recommend that a minimum 6-inch thick granular leveling course be placed directly below the slab to provide uniform support.

If the site grades are to be raised substantially, then construction of the floor slabs should be delayed several weeks to allow consolidation of the underlying fill and soft clay soils under the weight of the newly placed fills. It may be advisable to implement a settlement monitoring program to determine the magnitude and time rate of consolidation of the existing fills. Construction of the floor slabs can then commence once it has been determined that at least 90 percent consolidation of the fill has occurred.

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and. positive drainage of the aggregate base out from beneath the floor slab. Additional floor slab recommendations are provided below

Floor Slab Design Parameters

Item	Description
Floor Slab Support [1]	Minimum 6 inches of free-draining (less than 3% passing the U.S. No. 200 sieve) crushed aggregate compacted to at least 95% of ASTM D 698
Estimated Modulus of Subgrade Reaction [2]	115 pounds per square inch per inch (psi/in) for point loads

1. Floor slabs should be structurally independent of building footings or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.
2. The recommended modulus value is based on a 12-inch square plate. The modulus value used in design should be adjusted based on the actual size of the floor slab according to the Naval Facilities Engineering Design Manual 7.2, page 7.2-155, Table 4.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Settlement of floor slabs supported on existing fill materials cannot be accurately predicted, but could be larger than normal and result in some cracking. The floor slab can be stiffened by adding steel reinforcement, grade beams and/or post-tensioned elements.

Floor Slab Construction Considerations

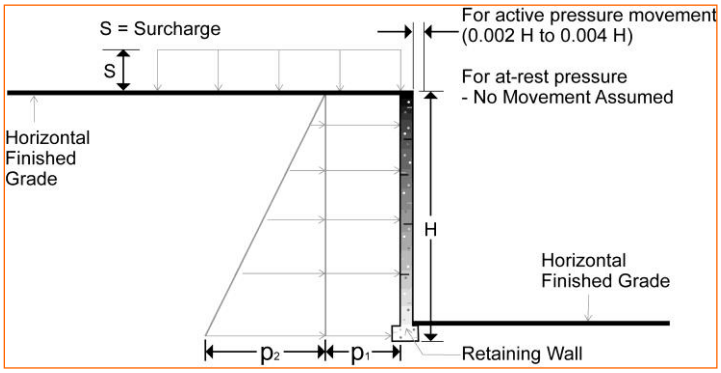
On most project sites, the site grading is generally accomplished early in the construction phase. However, as construction proceeds, the subgrade may be disturbed by utility excavations, construction traffic, desiccation, rainfall, etc. As a result, corrective action may be required prior to placement of the granular leveling course and concrete.

The condition of the floor slab subgrades should be reviewed and tested immediately prior to placement of the granular leveling course and construction of the slabs. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing the affected material and replacing it with engineered soil fill.

LATERAL EARTH PRESSURES

Design Parameters

Structures with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to values indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The "at-rest" condition assumes no wall movement and is commonly used for loading dock walls or other walls restrained at the top. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls (unless stated).



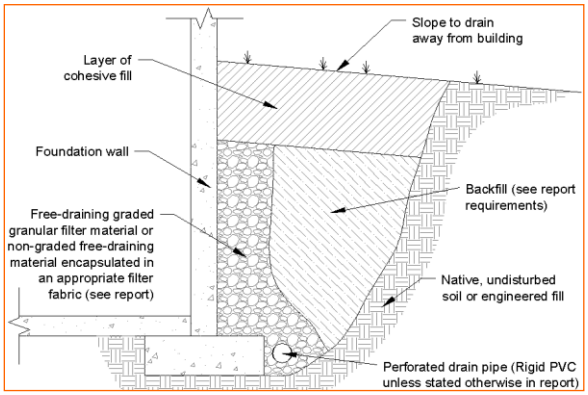
Lateral Earth Pressure Design Parameters				
Earth Pressure Condition [1]	**Coefficient for Backfill Type** [2]	**Surcharge Pressure** [3, 4, 5] **p_1 (psf)**	**Effective Fluid Pressures (psf)** [2, 4, 5]	
			Unsaturated [6]	**Submerged** [6]
Active (Ka)	Granular - 0.31	(0.31)S	(40)H	(80)H
At-Rest (Ko)	Granular - 0.47	0.47)S	(55)H	(90)H
Passive (Kp)	Granular - 3.25 Fine Grained - 2.46	--- ---	(390)H (295)H	(250)H (205)H

1. For active earth pressure, wall must rotate about base, with top lateral movements 0.002 H to 0.004 H, where H is wall height. For passive earth pressure, wall must move horizontally to mobilize resistance.
2. Uniform, horizontal backfill, compacted to at least 92 percent of the ASTM D 1557 maximum dry density, rendering a maximum total unit weight of 120 pcf.
3. Uniform surcharge, where S is surcharge pressure.
4. Loading from heavy compaction equipment is not included.
5. No safety factor is included in these values.
6. In order to achieve “Unsaturated” conditions, follow guidelines in **Subsurface Drainage for Below Grade Walls** below. “Submerged” conditions are recommended when drainage behind walls is not incorporated into the design.

Backfill placed against structures should consist of granular soils or low plasticity cohesive soils. For the granular values to be valid, the granular backfill must extend out and up from the base of the wall at an angle of at least 45 and 60 degrees from vertical for the active and passive cases, respectively.

Subsurface Drainage for Below Grade Walls

A perforated rigid plastic drain line installed behind the base of walls and extends below adjacent grade is recommended to prevent hydrostatic loading on the walls. The invert of a drain line around a below-grade building area or exterior retaining wall should be placed near foundation bearing level. The drain line should be sloped to provide positive gravity drainage to daylight or to a sump pit and pump. The drain line should be surrounded by clean, free-draining granular material having less than 5 percent passing the No. 200 sieve. The free-draining aggregate should be encapsulated in a filter fabric. The granular fill should extend to within 2 feet of final grade, where it should be capped with compacted cohesive fill to reduce infiltration of surface water into the drain system. For interior locations, the granular fill should extend to the floor slab subgrade elevation.



As an alternative to free-draining granular fill, a pre-fabricated drainage structure may be used. A pre-fabricated drainage structure is a plastic drainage core or mesh which is covered with filter fabric to prevent soil intrusion, and is fastened to the wall prior to placing backfill.

PAVEMENTS

General Pavement Comments

There is often a time lapse between the end of grading operations and the commencement of paving. Subgrades prepared early in the construction process can become disturbed by construction traffic. Non-uniform subgrades often result in poor pavement performance and local failures relatively soon after pavements are constructed. Depending on the paving equipment used by the contractor, measures may be required to improve subgrade strength to greater depths for support of heavily loaded trucks. Improvements should be made as recommended in **Earthwork**.

Before paving, and where recommended by Terracon, pavement subgrades should be proofrolled in the presence of a Terracon representative. Proofrolling of the subgrade should help locate soft,

yielding, or otherwise unsuitable soil at or just below the exposed subgrade level. Unsuitable areas observed at this time should be improved by scarification and compaction or be removed and replaced with engineered fill.

Pavement Design Parameters

A subgrade CBR of 3 should be used for the AC pavement designs, and a modulus of subgrade reaction of 115 pci should be used for the PCC pavement designs. The values were empirically derived based upon our experience with the describe soil type subgrade soils and our understanding of the quality of the subgrade as prescribed by the **Site Preparation** conditions as outlined in **Earthwork**.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.
Based on the possibility of shallow and/or perched groundwater, we recommend installing a pavement subdrain system to control groundwater, improve stability, and improve long term pavement performance.

We recommend at least 6 inches of free-draining granular material should be placed beneath the pavements. The use of a free draining granular base will also reduce the potential for frost action. We recommend pavement subgrades be crowned at least 2 percent, to promote the flow of water towards the subdrains, and to reduce the potential for ponding of water on the subgrade. The design recommendations for the subdrains are provided in the following table:

Subdrain Design Recommendations	
Item	**Value**
Free Draining Granular Base Thickness below Pavement	Minimum 6 inches of free-draining (such as IDOT CA-7) crushed aggregate compacted to at least 95% of ASTM D 698
Minimum Drain Pipe Diameter	4 inches
Drain Trench Width	16 inches or greater to provide minimum 6-inch annulus of drainage aggregate around drain pipe.
Invert Depth below Subgrade Elevation	3½ feet
Maximum Drain Pipe Spacing	50 feet
Subdrain Trench Backfill Material	No. 57 aggregate or ¾-inch aggregate

The subdrains should be hydraulically connected to the free-draining granular base layer. Subdrains should be sloped to provide positive gravity drainage to reliable discharge points such as a storm water detention basin or sewer line. Periodic maintenance of subdrains is required for long-term proper performance.

The pavement surfacing and adjacent sidewalks should be sloped to provide rapid drainage of surface water. Water should not be allowed to pond on or adjacent to these grade supported slabs, since this could saturate the subgrade and contribute to premature pavement or slab deterioration.

The pavement surfacing and adjacent sidewalks should be sloped to provide rapid drainage of surface water. Water should not be allowed to pond on or adjacent to slabs, since it could saturate the subgrade and contribute to premature pavement or slab deterioration.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic maintenance should be anticipated. Therefore, preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Maintenance consists of both localized maintenance (e.g. crack and joint sealing and patching) and global maintenance (e.g. surface sealing). Preventive maintenance is usually the priority when implementing a pavement maintenance program. Additional engineering observation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to paved areas should slope down from the edges at a minimum 2%
- Subgrade and pavement surfaces should have a minimum 2% slope to promote proper surface drainage
- Install below pavement drainage systems surrounding areas anticipated for frequent wetting
- Install joint sealant and seal cracks immediately
- Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils
- Place compacted, low permeability backfill against the exterior side of curb and gutter; and
- Place curb, gutter and/or sidewalk directly on clay subgrade soils rather than on unbound granular base course materials

SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7-10.

Description	Value
2012 International Building Code Site Classification (IBC) [1]	D [2]
Site Latitude	41.744
Site Longitude	-87.640
S_{DS} Spectral Acceleration for a Short Period [3]	0.148g
S_{D1} Spectral Acceleration for a 1-Second Period [3]	0.102g

1. Seismic site classification in general accordance with the *20XX International Building Code*, which refers to ASCE 7-10.
2. The 2012 International Building Code (IBC) uses a site profile extending to a depth of 100 feet for seismic site classification. Borings at this site were extended to a maximum depth of 58 feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.
3. These values were obtained using online seismic design maps and tools provided by the USGS (http://earthquake.usgs.gov/hazards/designmaps/).

GENERAL COMMENTS

Our services are conducted with the understanding of the project as described in the proposal, and will incorporate collaboration with the design team as we complete our services to verify assumptions. Revision of our understanding to reflect actual conditions important to our services will be based on these verifications and will be reflected in the final report. The design team should collaborate with Terracon to confirm these assumptions and to prepare the final design plans and specifications. This facilitates the incorporation of our opinions related to implementation of our geotechnical recommendations. Any information conveyed prior to the final report is for informational purposes only and should not be considered or used for decision-making purposes.

Our analysis and opinions are based upon our understanding of the geotechnical conditions in the area, the data obtained from our site exploration and from our understanding of the project. Variations will occur between exploration point locations, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical

Engineer, where noted in the final report, to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Support of floor slabs and pavements on or above existing fill materials is discussed in this report. However, even with the recommended construction procedures, there is an inherent risk for the owner that compressible fill or unsuitable material within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but can be reduced by following the recommendations contained in this report. To take advantage of the cost benefit of not removing the entire amount of undocumented fill, the owner must be willing to accept the risk associated with building over the undocumented fills following the recommended reworking of the material.

Our scope of services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third party beneficiaries intended. Any third party access to services or correspondence is solely for information purposes only. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Boring Layout and Elevations: A Terracon field engineer provided the boring layout. Coordinates were obtained from a hand-held GPS device with an accuracy of 20 feet (+/-). The existing ground surface elevations of the boring locations were estimated from a site topographic survey provided to Terracon. Elevations reference the Chicago City Datum (CCD).

Subsurface Exploration Procedures: We advance the borings with track-mounted rotary drill rig using continuous flight hollow-stem augers. The deep rock core borings utilized wash rotary drilling techniques. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge is pushed hydraulically into the soil to obtain a relatively undisturbed sample. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon is driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observe and record groundwater levels during drilling and sampling. For safety purposes, all borings are backfilled with a mixture of auger cuttings and bentonite chips after their completion. The rock core borings were backfilled with bentonite grout.

Upon encountering bedrock in select borings, a rock core (using NX rock core barrel) was obtained. Water was used as a drilling fluid for rock coring and the spent water was discharged on site.

The sampling depths, penetration distances, and other sampling information are recorded on the field boring logs. The samples are placed in appropriate containers and taken to our soil laboratory for testing and classification by a geotechnical engineer. Our exploration team prepares field boring logs as part of the drilling operations. These field logs include visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs are prepared from the field logs. The final boring logs represent the geotechnical engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviews the field data and assigns various laboratory tests to better understand the engineering properties of the various soil and rock strata as necessary for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods are applied because of local practice or professional judgment.

Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D2166/D2166M Standard Test Method for Unconfined Compressive Strength of Cohesive Soil
- ASTM D7012 Standard Test Method for Uniaxial Compressive Strength of Rock; Method C
- ASTM D2435/D2435M Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading

The laboratory testing program often includes examination of soil samples by an engineer. Based on the material's texture and plasticity, we describe and classify the soil samples in accordance with the Unified Soil Classification System.

Rock classification is conducted using locally accepted practices for engineering purposes; petrographic analysis may reveal other rock types. Rock core samples typically provide an improved specimen for this classification. Boring log rock classification is determined using the Description of Rock Properties.

SITE LOCATION AND EXPLORATION PLANS

SITE LOCATION

Green Era Biotechnology Plant ■ Chicago, Illinois
October 19, 2018 ■ Terracon Project No. MR175403

Terracon GeoReport

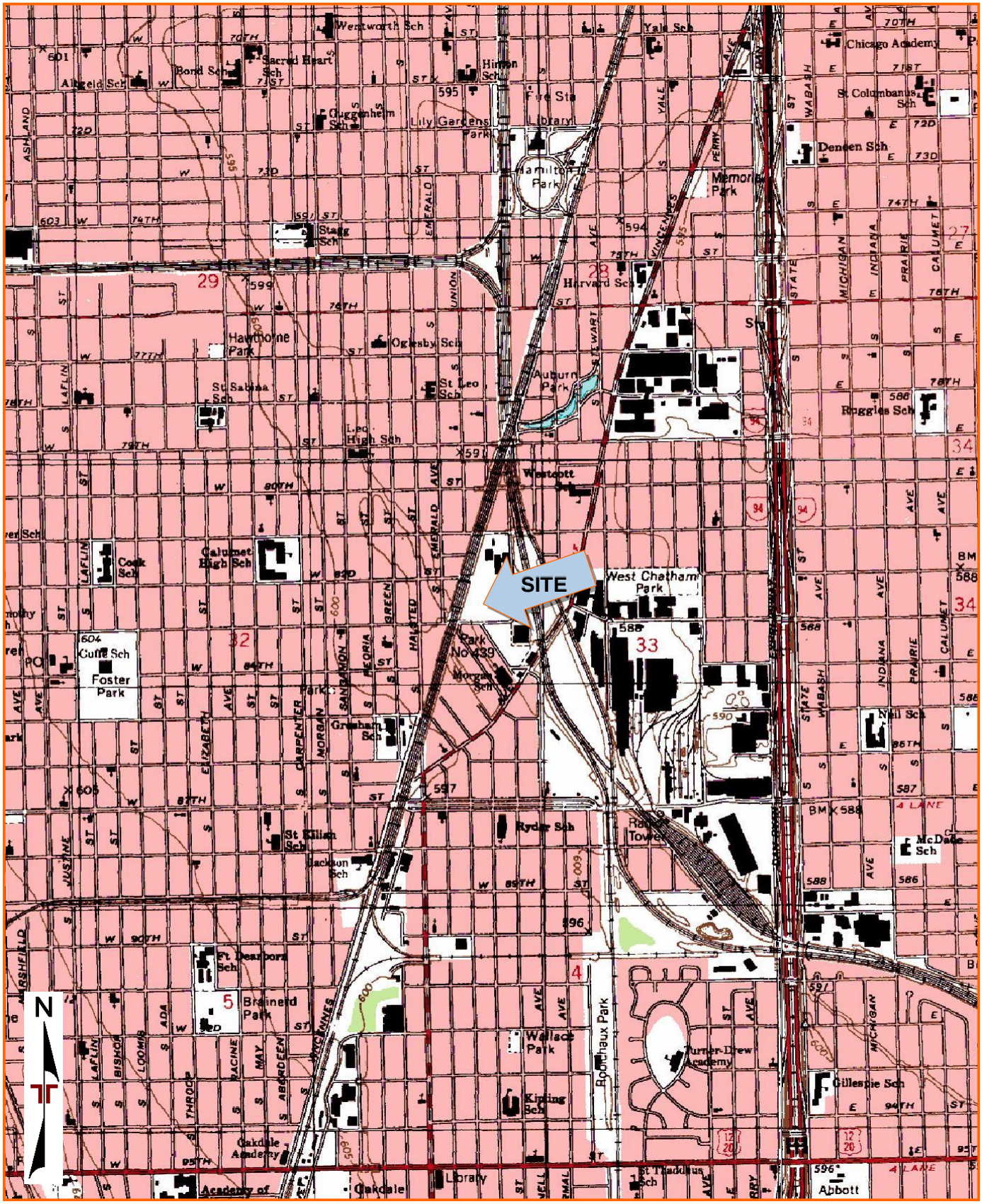


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY QUADRANGLES INCLUDE: ENGLEWOOD, IL (1/1/1997), JACKSON PARK, IL (1/1/1998), BLUE ISLAND, IL (1/1/1997) and LAKE CALUMET, IL (1/1/1997).

EXPLORATION PLAN

B-1 B-2 B-3 B-4 (MW-4) B-5 B-6 B-7 B-8 B-9 B-10 B-11 B-12 B-13 B-14 B-15 B-16 B-17 B-18 B-19 B-20

N

Scale: 1 inch = 30 ft.

LEGEND:

- PROPERTY LINE
- HWL — HIGH WATER LEVEL
- CCD — CHICAGO CITY DATUM
- FFE — FINISHED FLOOR ELEVATION
- 15.00 — PROPOSED CONTOUR
- FLARED END SECTION (FES)
- 4'Ø CATCH BASIN (CB)

NO.	DATE	ISSUE
1	1/19/18	SCHEMATIC DESIGN

GREEN ERA EDUCATIONAL NFP
GREEN ERA SUSTAINABILITY, LLC

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED ARCHITECT UNDER THE LAWS OF THE STATE OF ILLINOIS

DATE: _____ REGISTRATION NO.: _____

DRAWN BY: MJC
CHECKED BY: CAM
APPROVED: CAM
SCALE: 1"=30'

Job No. 15-194-001

SITE GRADING PLAN
C3.0

EXPLORATION RESULTS

BORING LOG NO. B-1

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7449° Longitude: -87.64°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
			URBAN FILL, consisting of varying amounts of sand, gravel, clay, brick, wood, and organics		▽		16	4-9-10 N=19	1			21	
							13	5-11-8 N=19	2			13	
				5			14	2-3-3 N=6	3			46	
7.0	8+/-		**SILTY SAND (SM)**, trace gravel and organics, dark gray, loose, saturated				15	1-2-2 N=4	4			31	
9.0	6+/-		**LEAN CLAY (CL)**, trace sand and gravel, gray, soft to medium stiff	10			8	2-1-2 N=3	5	0.50 (HP)		23	
				15			18	1-1-2 N=3	6	0.25 (HP)		26	34-16-18
18.0	-3+/-		**LEAN CLAY (CL)**, trace sand and gravel, gray, very stiff to hard				19		7	2.00 (HP)	5.06	17	27-15-12
				20			16	5-7-8 N=15	8	4.50 (HP)		13	
							17	4-5-6 N=11	9	4.50 (HP)		13	
				25									
							17	4-7-8 N=15	10	4.00 (HP)		13	
				30									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger to 10 feet, then rotary wash to 52', then rock core to 58'.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

▽ *1.5' while drilling*

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-28-2017 | Boring Completed: 11-28-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-1

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7449° Longitude: -87.64°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
	LEAN CLAY (CL), trace sand and gravel, gray, very stiff to hard *(continued)*								
		35	18	4-5-7 N=12	11	3.50 (HP)		13	
37.0	-22+/-								
	SILTY CLAY WITH GRAVEL (CL/ML), trace sand, gray, hard								
		40	18	7-11-18 N=29	12	4.50 (HP)		12	
40.0	-25+/-								
	SILTY CLAY (CL/ML), trace sand and gravel, gray, hard								
		45	18	17-37-60 N=97	13	3.50 (HP)		10	
		50	9	38-50/3"	14	4.50+ (HP)		9	
50.0	-35+/-								
	DOLOMITE, light gray, slightly fractured, moderate spacing, unweathered, medium strong								
	Recovery = 94% RQD = 67% Unit Weight = 159 pcf Unconfined Compressive Strength = 4935 psi	55	68		RUN 1			2	
58.0	-43+/-								
	Boring Terminated at 58 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger to 10 feet, then rotary wash to 52', then rock core to 58'.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

1.5' while drilling

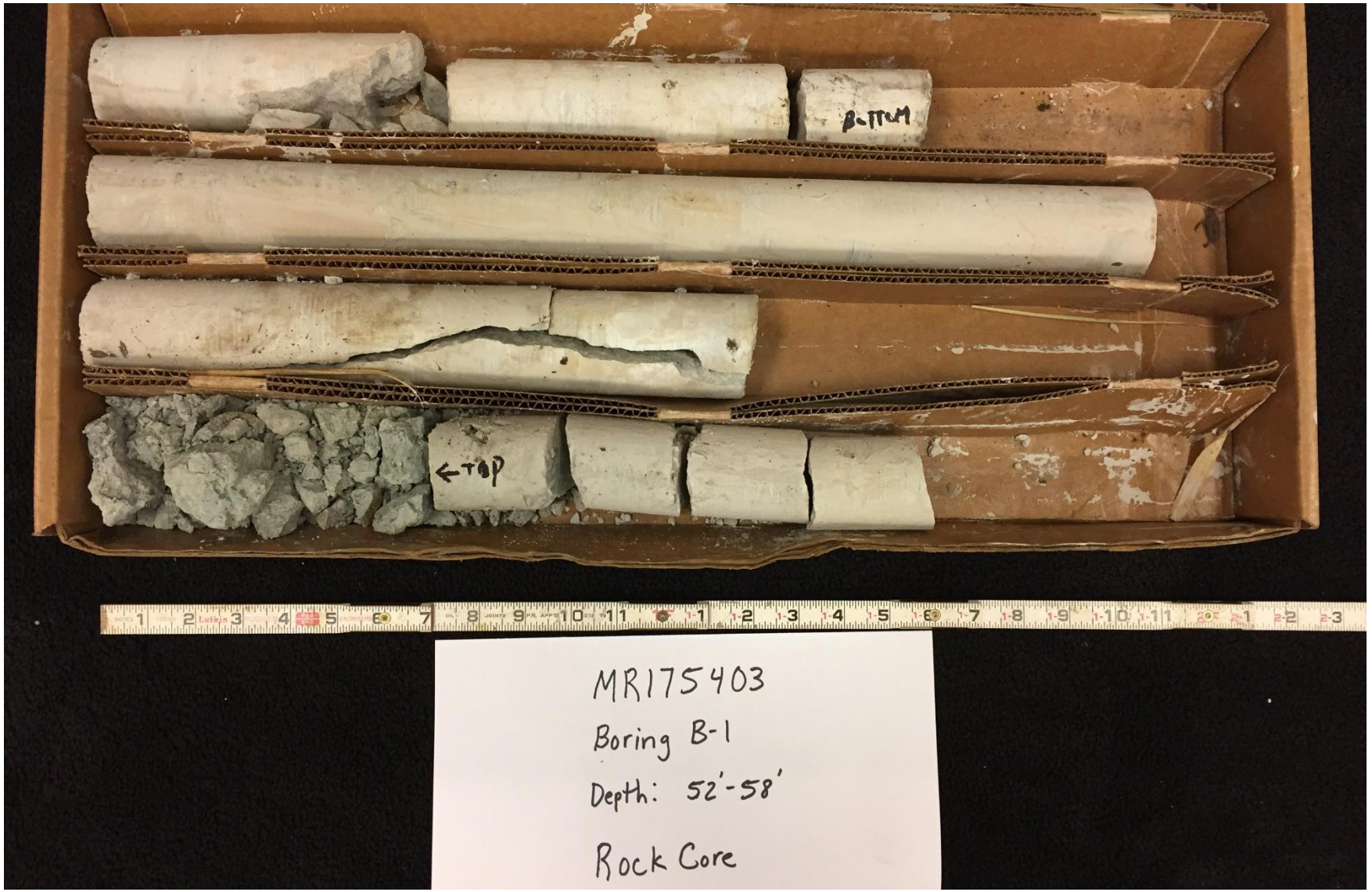
Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-28-2017 | Boring Completed: 11-28-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

Rock Core Photograph – Boring B-1 – Run #1
Green Era Biotechnology Plant ■ Chicago, Illinois
October 22, 2018 ■ Terracon Project No. MR175403R1



Terracon
Consulting Engineers & Scientists

UNIAXIAL COMPRESSIVE STRENGTH
ASTM D 7012
Method C

Laboratory Services Group 750 Corporate Woods Parkway Vernon Hills, Illinois 60061 Ph. (224)352-7000 fax (224)352-7024

Project No.:	MR175403	Tested By:	BCM	Date:	12/8/2017
Project Name:	GREEN ERA BIOTECHNOLOGY PLANT	Calculated By:	BCM	Date:	12/8/2017
Boring No.	B-1	Checked By:	WPQ	Date:	12/8/2017
Depth:	57.5'	Sample ID No.:	S-1		
Rock Description:	GRAY ROCK CORE				

Rock Sample Moisture Condition: [x] As Received [ ] In-Situ [ ] Saturated [ ] Oven Dry

TOLERANCE CHECK

End Flatness: Max. Amplitude	1) 0.0055	2) 0.0056	3) 0.0052	in.;	<0.0010	Yes			
Squarness: >0.01 in. gap at 2 in	No	If Yes, 0.01 in. at		in.					
Sides: Max. Amplitude	1) 0.033	2) 0.038	3) 0.041	in.	< 0.01 in.?	Yes			

Angle of Core Axis to Bedding: 90 deg Stress or Strain Rate: 0.03 % / min.

Length (in):	1) 4.0020	2) 4.0150	3) 4.0580	Avg.	4.0250	in.	
Diameter (in):	1) 1.988	2) 1.982	3) 1.982	Avg.	1.984	in.	Area $(in)^2$ 3.09

Uniaxial Compressive Strength: **4935** psi Weight: 520.06 grams

L/D: **2.0** Weight: 1.146 lbs.

Load: **15240** lbs. **Unit Weight:** **159.1** pcf

YOUNG'S MODULUS

Et (50% Co)	-	x 10^5 psi
Es (50% Co)	-	

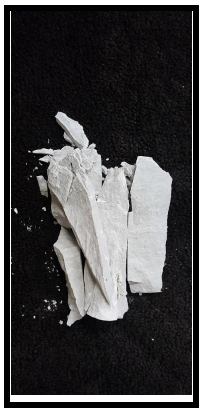
POISSON'S RATIO

Vt (50% Co)	-
Vs (50% Co)	-

REMARKS:

Before

After



BORING LOG NO. B-2

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7449° Longitude: -87.6397°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
						12	5-15-24 N=39	1			5	
						16	10-10-10 N=20	2			9	
						16	4-5-4 N=9	3			40	
			5									
				▽		15	3-2-3 N=5	4			30	
						16	2-3-2 N=5	5	0.50 (HP)		25	36-17-19
			10									
						15	2-2-2 N=4	6	0.50 (HP)		25	36-15-21
			15									
						18	0-0-2 N=2	7	0.25 (HP)		26	34-16-18
			20									
						15	4-6-7 N=13	8	2.50 (HP)		15	
			25									
						18	6-11-13 N=24	9	4.50 (HP)		12	
			30									

URBAN FILL, consisting of varying amounts of sand, gravel, clay, brick, wood, and organics

7.0 — 8+/-

SILTY SAND (SM), trace gravel and organics, dark gray, loose, saturated

8.5 — 6.5+/-

LEAN CLAY (CL), trace sand and gravel, gray, soft to medium stiff

21.0 — -6+/-

LEAN CLAY (CL), trace sand and gravel, gray, very stiff to hard

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger to 10 feet, then rotary wash to boring termination.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

▽ *7' while sampling*

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-27-2017 | Boring Completed: 11-27-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-2

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7449° Longitude: -87.6397°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
LEAN CLAY (CL), trace sand and gravel, gray, very stiff to hard *(continued)*									
32.0	-17+/-								
SILTY CLAY (CL/ML), trace sand and gravel, gray, hard		35	15	7-8-10 N=18	10	4.50 (HP)		15	
			16	7-11-14 N=25	11	4.50 (HP)		14	
42.0	-27+/-	40							
SILT WITH GRAVEL (ML), trace clay, gray, very dense, moist			18	28-46-62 N=108	12			12	
		45							
50.0	-35+/-		12	52-81-50/1" N=81+51/1"	13			12	
50.5 Rock fragments. Assumed top of rock.	-35.5+/-	50	1	50/1"	14			18	
Boring Terminated at 50.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger to 10 feet, then rotary wash to boring termination.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

▽ 7' while sampling

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-27-2017 | Boring Completed: 11-27-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-3

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7448° Longitude: -87.6403°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
						13	5-8-11 N=19	1			11	
				▽		8	6-50/3" N=50/3"	2	2.25 (HP)		15	
						14	4-5-7 N=12	3			42	
			5									
						16	2-2-1 N=3	4			28	
						15	2-3-2 N=5	5	1.50 (HP)		23	
			10									
						17	1-1-1 N=2	6	0.50 (HP)		28	36-16-20
			15									
						18	0-1-2 N=3	7	0.25 (HP)		24	
			20									
						16	6-7-10 N=17	8	3.00 (HP)		14	
			25									
						17	5-9-11 N=20	9	3.00 (HP)		15	
			30									

URBAN FILL, consisting of varying amounts of sand, gravel, clay, brick, wood, and organics

6.5 — 8.5+/-

SILTY SAND (SM), trace gravel and organics, dark gray, loose, wet

8.5 — 6.5+/-

LEAN CLAY (CL), trace sand and gravel, gray, stiff

10.0 — 5+/-

LEAN CLAY (CL), trace sand and gravel, gray, soft to medium stiff

21.0 — -6+/-

LEAN CLAY (CL), trace sand and gravel, gray, very stiff to hard

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger to 10 feet, then rotary wash to boring termination.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

▽ *2' while drilling*

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-27-2017 | Boring Completed: 11-27-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-3

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7448° Longitude: -87.6403°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
	LEAN CLAY (CL), trace sand and gravel, gray, very stiff to hard *(continued)*								
			18	7-8-12 N=20	10	3.00 (HP)		16	
36.0	-21+/-	35							
	SILTY CLAY WITH GRAVEL (CL/ML), trace sand, gray, hard								
			18	7-8-9 N=17	11	4.00 (HP)		16	
42.0	-27+/-	40							
	SILT WITH GRAVEL (ML), trace clay, gray, very dense, moist								
			18	22-45-57 N=102	12			14	
		45							
			18	38-45-56 N=101	13			10	
50.0	-35+/-	50							
	Boring Terminated at 50 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger to 10 feet, then rotary wash to boring termination.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

▽ *2' while drilling*

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-27-2017 | Boring Completed: 11-27-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-4

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7447° Longitude: -87.64°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
			12	9-11-11 N=22	1			35	
			13	8-13-10 N=23	2	4.50+ (HP)		10	
		5	10	4-4-5 N=9	3	4.00 (HP)		16	
7.0	8+/-		18	2-2-4 N=6	4			30	
9.0	6+/-		18	2-1-3 N=4	5	0.50 (HP)		24	
18.0	-3+/-	10	18	1-2-1 N=3	6	0.50 (HP)		24	
25.0	-10+/-	15	18	2-3-5 N=8	7	2.00 (HP)		16	
		20	18	3-4-7 N=11	8	4.00 (HP)		13	
		25							

URBAN FILL, consisting of varying amounts of sand, gravel, clay, brick, wood, and organics

SILTY SAND (SM), trace gravel and organics, dark gray, loose, wet

LEAN CLAY (CL), trace sand and gravel, gray, medium stiff

LEAN CLAY (CL), trace sand and gravel, gray, very stiff to hard

Boring Terminated at 25 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

1.5' while drilling

2' upon completion

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-28-2017 | Boring Completed: 11-28-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-5

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7447° Longitude: -87.6397°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
						12	7-11-10 N=21	1			6	
				▽		16	19-27-14 N=41	2			10	
				▽								
						16	4-6-5 N=11	3			15	
			5									
						12	2-3-5 N=8	4			25	
						16	1-2-3 N=5	5	0.50 (HP)		22	
			10									
						17	1-1-2 N=3	6	0.50 (HP)		24	
			15									
						15	3-4-4 N=8	7	2.00 (HP)		15	
			20									
						16	5-4-8 N=12	8	4.50 (HP)		13	
			25									

URBAN FILL, consisting of varying amounts of sand, gravel, clay, brick, wood, and organics

Sample 3: Petroleum odor

7.0 8+/-

SILTY SAND (SM), trace gravel and organics, dark gray, loose, wet

9.0 6+/-

LEAN CLAY (CL), trace sand and gravel, gray, medium stiff

18.0 -3+/-

LEAN CLAY (CL), trace sand and gravel, gray, very stiff to hard

25.0 -10+/-

Boring Terminated at 25 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

▽ *1.5' while drilling*

▽ *3' upon completion*

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-28-2017 | Boring Completed: 11-28-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-6

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7447° Longitude: -87.6394°

Approximate Surface Elev: 13.5 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
						14	4-7-8 N=15	1			7	
				▽		16	6-9-5 N=14	2			13	
							3-5-4 N=9	3				
			5			17	2-2-1 N=3	4			28	
				▽								
						17	1-2-2 N=4	5	0.50 (HP)		24	
			10									
						17	1-1-1 N=2	6	0.25 (HP)		24	
			15									
						16	2-2-2 N=4	7	0.25 (HP)		25	
			20									
						18	4-6-8 N=14	8	4.00 (HP)		13	
			25									

URBAN FILL, consisting of varying amounts of sand, gravel, clay, brick, wood, and organics

7.0 6.5+/-

SILTY SAND (SM), trace gravel and organics, dark gray, loose, wet

9.0 4.5+/-

LEAN CLAY (CL), trace sand and gravel, gray, soft to medium stiff

22.0 -8.5+/-

LEAN CLAY (CL), trace sand and gravel, gray, hard

25.0 -11.5+/-

Boring Terminated at 25 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

▽ *2.5' while drilling*

▽ *8' upon completion*

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-29-2017 Boring Completed: 11-29-2017

Drill Rig: D-120 track Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-7

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7445° Longitude: -87.6404°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DESCRIPTION
0.0	15+/-	**URBAN FILL**, consisting of varying amounts of sand, gravel, clay, brick, wood, and organics
6.0	9+/-	**SILTY SAND (POSSIBLE FILL) (SM)**, with organics, dark gray to black, loose, wet
8.0	7+/-	**LEAN CLAY (CL)**, trace sand and gravel, gray, medium stiff
21.0	-6+/-	**LEAN CLAY (CL)**, trace sand and gravel, gray, hard
25.0	-10+/-	***Boring Terminated at 25 Feet***

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
			12	5-5-5 N=10	1			12	
			13	6-11-8 N=19	2	2.50 (HP)		16	
	▽								
5			10	2-3-3 N=6	3			23	
	▽		14	2-2-2 N=4	4			98	
			16	1-1-1 N=2	5	0.50 (HP)		24	
10									
			14	2-2-1 N=3	6	0.50 (HP)		14	
15									
			17	0-2-4 N=6	7	0.50 (HP)		26	
20									
			18	4-5-7 N=12	8	4.00 (HP)		14	
25									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

▽ *3.5' while drilling*

▽ *7' upon completion*

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-27-2017 | Boring Completed: 11-27-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-8

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7445° Longitude: -87.6398°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
				▽		3	4-12-10 N=22	1			23	
						15	5-11-12 N=23	2			11	
						6	6-5-5 N=10	3			26	
			5			16	2-1-1 N=2	4			26	
				▽								
						18	2-2-2 N=4	5	0.50 (HP)		25	
			10									
						18	1-1-2 N=3	6	0.50 (HP)		25	
			15									
						18	2-2-2 N=4	7	0.50 (HP)		24	
			20									
						18	4-5-7 N=12	8	4.50 (HP)		13	
			25									

URBAN FILL, consisting of varying amounts of sand, gravel, clay, brick, wood, and organics

7.0 8+/-

SILTY SAND (SM), trace gravel and organics, dark gray, loose, wet

8.5 6.5+/-

LEAN CLAY (CL), trace sand and gravel, gray, medium stiff

22.0 -7+/-

LEAN CLAY (CL), trace sand and gravel, gray, hard

25.0 -10+/-

Boring Terminated at 25 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

▽ *2' while drilling*

▽ *8' upon completion*

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-29-2017 | Boring Completed: 11-29-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-9

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7445° Longitude: -87.6402°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
					10	4-9-8 N=17	1			20	
			▽		12	5-9-10 N=19	2			9	
					14	3-3-3 N=6	3			19	
		5	▽								
					14	3-4-4 N=8	4	2.00 (HP)		19	
					15	2-1-1 N=2	5	0.50 (HP)		26	
		10									
					14	2-2-2 N=4	6	0.75 (HP)		25	
		15									
					13	0-2-3 N=5	7	0.50 (HP)		17	
		20									
					15	5-8-7 N=15	8	4.50 (HP)		14	
		25									

URBAN FILL, consisting of varying amounts of sand, gravel, clay, brick, wood, and organics

7.0 8+/-

LEAN CLAY (CL), trace sand and gravel, gray, very stiff

8.5 6.5+/-

LEAN CLAY (CL), trace sand and gravel, gray, medium stiff

21.0 -6+/-

LEAN CLAY (CL), trace sand and gravel, gray, hard

25.0 -10+/-

Boring Terminated at 25 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

▽ *2' while drilling*

▽ *6' upon completion*

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-27-2017 | Boring Completed: 11-27-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-10

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7444° Longitude: -87.6394°

Approximate Surface Elev: 13 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
	URBAN FILL, consisting of varying amounts of sand, gravel, clay, brick, wood, and organics				12	4-9-8 N=17	1			17	
			▽		13	9-6-7 N=13	2			25	
4.0	9+/-										
	SILTY SAND (POSSIBLE FILL) (SM), trace gravel and organics, dark gray to dark brown, loose, wet	5			12	4-4-3 N=7	3			34	
			▽		17	2-2-1 N=3	4	0.50 (HP)		42	
9.0	4+/-										
	LEAN CLAY (CL), trace sand and gravel, gray, soft to medium stiff	10			18	1-2-2 N=4	5	0.50 (HP)		25	
		15			18	1-2-1 N=3	6	0.50 (HP)		24	
		20			17	2-2-2 N=4	7	0.25 (HP)		24	
22.0	-9+/-										
	LEAN CLAY (CL), trace sand and gravel, gray, hard	25			18	4-7-6 N=13	8	4.00 (HP)		13	
25.0	-12+/-										
	Boring Terminated at 25 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

▽ *2.5' while drilling*

▽ *7' upon completion*

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-29-2017 | Boring Completed: 11-29-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-11

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7436° Longitude: -87.6411°

Approximate Surface Elev: 16.5 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DESCRIPTION
0.0	16.5+/-	**URBAN FILL**, consisting of varying amounts of sand, gravel, clay, brick, wood, and organics
7.0	9.5+/-	**SILTY SAND (SM)**, trace gravel, gray, loose, wet
9.0	7.5+/-	**LEAN CLAY (CL)**, trace sand and gravel, gray, medium stiff
15.0	1.5+/-	***Boring Terminated at 15 Feet***

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
			13	4-6-10 N=16	1			12	
	▽		16	6-13-9 N=22	2			5	
	▽		12	18-7-4 N=11	3			13	
5			14	3-4-8 N=12	4			34	
			18	1-2-2 N=4	5	0.50 (HP)		22	
10									
			18	1-1-2 N=3	6	1.00 (HP)		22	
15									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

▽ *2.5' while drilling*

▽ *4' upon completion*

Terracon
650 W Lake St Ste 420
Chicago, IL

Boring Started: 11-29-2017 | Boring Completed: 11-29-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

WELL LOG NO. MW-4

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION: See Exhibit A-2

Latitude: 41.7447° Longitude: -87.64°

Approximate Surface Elev: 15 (Ft.) +/-

DEPTH ELEVATION (Ft.)

GRAPHIC LOG	INSTALLATION DETAILS	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	SAMPLE NUMBER	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
See boring log B-4 for soil stratigraphy.	5' well stick-up; Bentonite chips (0 to 3 feet) around 1.0" SCH 40 PVC Solid Pipe (to 5 foot depth); #40 Red Flint (80-120mm) washed sand (3 to 15 feet); Slotted screen interval (5 to 15 feet), 1.0" SCH 40 PVC Slotted Pipe (0.010 inch slot)	5; 10; 15	▽								
Boring Terminated at 15 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:
Elevations reference the Chicago City Datum (CCD).

WATER LEVEL OBSERVATIONS

▽ *5.5' on 12/8/2017*

Terracon
650 W Lake St Ste 420
Chicago, IL

Well Started: 11-28-2017 | Well Completed: 11-28-2017

Drill Rig: D-120 track | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-12

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.744° Longitude: -87.6412°

Approximate Surface Elev: 17 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DESCRIPTION
0.3	16.5+/-	**GRAVEL SURFACE**, 3 inches
		FILL - SILTY CLAY, trace gravel, sand, and wood, gray and brown
		Sample 2: pounded rock, low recovery
6.0	11+/-	**SILTY SAND (SM)**, trace clay and gravel, dark gray, moist, loose
8.0	9+/-	**LEAN CLAY (CL)**, trace sand and gravel, gray, medium stiff
18.0	-1+/-	**SILTY SAND (SM)**, trace clay and gravel, gray, moist, loose
23.0	-6+/-	**SILTY LEAN CLAY (CL)**, trace sand and gravel, gray, hard

DEPTH (Ft.)	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
	16	9-15-20 N=35	1	3.00 (HP)		7	
	1	50/1"	2			3	
5	16	3-2-1 N=3	3			33	
10	17	3-1-1 N=2	4	0.50 (HP)		26	
	18	2-1-1 N=2	5	0.75 (HP)		21	
15	17	2-1-1 N=2	6	0.75 (HP)		24	
20	18	3-3-3 N=6	7			17	
25	18	5-7-8 N=15	8	7.50 (HP)		13	
30	18	6-7-9 N=16	9	5.75 (HP)		13	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

9' while drilling

20' upon completion

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-02-2018 | Boring Completed: 10-02-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-12

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.744° Longitude: -87.6412°

Approximate Surface Elev: 17 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
	SILTY LEAN CLAY (CL), trace sand and gravel, gray, hard *(continued)*										
		35			18	5-8-10 N=18	10	9.00 (HP)		13	
		40			18	8-11-14 N=25	11	9.00 (HP)		13	
		45			18	35-43-52 N=95	12	9.00 (HP)		9	
48.0	-31+/-										
49.0	**APPARENT BEDROCK** -32+/-				2	50/2"	13			5	
	Boring Terminated at 49 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

9' while drilling

20' upon completion

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-02-2018 | Boring Completed: 10-02-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-13

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7439° Longitude: -87.6409°

Approximate Surface Elev: 16.5 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
0.3	16+/-											
GRAVEL SURFACE, 3 inches												
FILL - SILTY SAND, trace clay and gravel, dark brown to gray, moist					X	16	12-12-15 N=27	1			8	
					X	17	6-6-7 N=13	2			10	
6.0	10.5+/-		5									
POSSIBLE FILL - CLAYEY SAND (SC), trace gravel and organics, gray, moist, loose					X	18	2-2-2 N=4	3			32	
8.5	8+/-											
LEAN CLAY (CL), trace sand and gravel, gray, medium stiff to stiff					X	18	2-1-1 N=2	4	1.50 (HP)		22	
			10									
Sample 5: pushed rock, disturbed					X	14	2-2-2 N=4	5	dist.		22	
					■	22		6	1.00 (HP)	1.06	23	106
			15		X	18	2-2-2 N=4	7	1.00 (HP)		21	
18.0	-1.5+/-											
SILTY SAND (SM), trace clay and gravel, gray, moist, loose					X	18	2-2-4 N=6	8	1.25 (HP)		21	
22.0	-5.5+/-		20									
SILTY LEAN CLAY (CL), trace sand and gravel, gray, hard					X	18	8-10-11 N=21	9	7.75 (HP)		12	
			25									
					X	16	7-10-14 N=24	10	5.50 (HP)		14	
			30									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to 10 feet, then rotary wash to bedrock. Bedrock cored with NX diamond core barrel.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered prior to addition of drilling fluid

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-02-2018 | Boring Completed: 10-02-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-13

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7439° Longitude: -87.6409°

Approximate Surface Elev: 16.5 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	WATER CONTENT (%)
	SILTY LEAN CLAY (CL), trace sand and gravel, gray, hard *(continued)*					
		18	7-15-16 N=31	11	9.50 (HP)	10
		16	20-14-15 N=29	12	7.50 (HP)	12
41.0	-24.5+/-					
	SILT (ML), trace gravel, gray, moist, very dense					
		18	35-40-50 N=90	13		8
48.0	-31.5+/-					
	DOLOMITE, slightly fractured, thin bedding, slightly weathered, strong rock	2	50/2"	14		11
	Unconfined Compression Test at 51' Unit weight = 167 pcf Uniaxial Compressive Strength = 12,324 psi	116	Rec. = 97% RQD = 60%	RUN 1		
58.5	-42+/-					
	Boring Terminated at 58.5 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to 10 feet, then rotary wash to bedrock. Bedrock cored with NX diamond core barrel.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered prior to addition of drilling fluid

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-02-2018 | Boring Completed: 10-02-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

Rock Core Photograph – Boring B-13 – Run #1
Green Era Biotechnology Plant ■ Chicago, Illinois
October 22, 2018 ■ Terracon Project No. MR175403R1

Terracon

Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying Stress and Temperatures
ASTM D 7012
Method C

Laboratory Services Group *192 Exchange Boulevard* *Glendale Heights, Illinois 60139* *Phone: (630) 717-4263*

Project No.:	MR175403	Tested By:	BCM	Date:	10/18/18
Project Name:	Green Era Biotechnology Plant	Calculated By:	BCM	Date:	10/18/18
Boring No.	B-13 Sample: Core	Checked By:	WPQ	Date:	10/18/18
Depth (ft):	50.0'-51.0'				
Description:	Light Gray Rock Core				

Rock Sample Moisture Condition at Test: [X] As Received [ ] See Remarks [ ] Saturated [ ] Oven Dry

TOLERANCE CHECK

Side Straightness		Maxumum Gap ≤ 0.020 in						Tolerance Met	PASS
End Flatness: Max.	Diameter 1a	0.0014	in	Diameter 1b	0.0016	in	≤ 0.002 in	Tolerance Met	PASS
End Flatness: Max.	Diameter 2a	0.0019	in	Diameter 2b	0.0018	in	≤ 0.002 in	Tolerance Met	PASS
Perpendicularity Slope	Diameter 1a	0.0027		Diameter 1b	0.0029		≤ 0.0043	Tolerance Met	PASS
Perpendicularity Slope	Diameter 2a	0.0031		Diameter 2b	0.0038		≤ 0.0043	Tolerance Met	PASS

Length (mm): 1) 3.995 2) 3.994 3) 3.999 Avg. 3.996 in

Diameter (mm): 1) 1.947 2) 1.954 3) 1.949 Avg. 1.950 in

Uniaxial Compressive Strength: **12,324** psi Mass 522.22 grams

Load: **36,800** lbs Mass 1.151 lb

L/D: **2.0** **Unit Weight:** **166.7** pcf

YOUNG'S MODULUS	
E_t (50% Co)	-

POISSON'S RATIO	
u_t (50% Co)	-

REMARKS: Some Suface Cracking

Before

After

BORING LOG NO. B-14

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7441° Longitude: -87.641°

Approximate Surface Elev: 17 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DESCRIPTION
0.3	16.5+/-	**WOOD CHIPS**, 3 inches
		FILL - SILTY CLAY, trace gravel, sand, and wood, gray and brown
		Sample 2: pounded rock, low recovery
6.0	11+/-	**POSSIBLE FILL - SILTY SAND (SM)**, trace clay and gravel, dark gray, moist, loose
8.0	9+/-	**LEAN CLAY (CL)**, trace sand and gravel, gray, medium stiff
21.0	-4+/-	**SILTY LEAN CLAY (CL)**, trace sand and gravel, gray, hard

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
			16	10-26-14 N=40	1	5.00 (HP)		16	
5			15	1-1-1 N=2	2	3.50 (HP)		15	
	▽		15	2-2-2 N=4	3			28	
10			16	3-2-2 N=4	4	0.75 (HP)		23	
			14	3-3-2 N=5	5	0.75 (HP)		23	
15	▽		16	3-2-2 N=4	6	0.50 (HP)		24	
20			18	3-5-5 N=10	7			22	
25			18	7-7-9 N=16	8	6.75 (HP)		13	
30			18	6-8-11 N=19	9	7.50 (HP)		13	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

▽ *6' while drilling*

▽ *15' upon completion*

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-02-2018 | Boring Completed: 10-02-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-14

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7441° Longitude: -87.641°

Approximate Surface Elev: 17 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	WATER CONTENT (%)
SILTY LEAN CLAY (CL), trace sand and gravel, gray, hard *(continued)*							
		35	18	7-9-13 N=22	10	7.50 (HP)	10
		40	18	7-8-12 N=20	11	9.00 (HP)	12
		45	18	16-40-48 N=88	12	9.50 (HP)	10
48.5	-31.5+/-						
49.0 **APPARENT BEDROCK**	-32+/-			50/1"	13		6
Boring Terminated at 49 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

6' while drilling

15' upon completion

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-02-2018 | Boring Completed: 10-02-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-15

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7444° Longitude: -87.6411°

Approximate Surface Elev: 17 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DESCRIPTION
0.3	16.5+/-	**GRAVEL SURFACE**, 3 inches
		FILL - SANDY CLAY, trace gravel, sand, brick, and wood, dark gray and brown, moist
6.0	11+/-	**SILTY SAND (SM)**, trace organics, clay, and gravel, dark gray, wet, loose
10.0	7+/-	**LEAN CLAY (CL)**, trace sand and gravel, gray, medium stiff
17.5	-0.5+/-	**LEAN CLAY (CL)**, trace sand and gravel, gray, very stiff
23.0	-6+/-	**SILTY LEAN CLAY (CL)**, trace sand and gravel, gray, hard

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
			16	14-13-11 N=24	1			15	
5			2	21-28-19 N=47	2			16	
			17	3-3-3 N=6	3			33	
			10	1-1-1 N=2	4			24	
10									
	▽		18	1-1-1 N=2	5	0.75 (HP)		24	
			18	1-2-1 N=3	6	0.75 (HP)		24	
15									
			21		7	0.75 (HP)	1.85	21	111
20									
			18	7-9-13 N=22	8	6.75 (HP)		12	
25									
			18	9-7-12 N=19	9	5.50 (HP)		13	
30									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock. Bedrock cored with NX diamond core barrel.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

▽ *11' while drilling*

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-05-2018 | Boring Completed: 10-05-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-15

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7444° Longitude: -87.6411°

Approximate Surface Elev: 17 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	WATER CONTENT (%)
	SILTY LEAN CLAY (CL), trace sand and gravel, gray, hard *(continued)*						
		35	18	8-9-11 N=20	10	6.50 (HP)	13
		40	18	6-6-9 N=15	11	4.50 (HP)	14
42.0	-25+/-						
	SILT (ML), trace clay and gravel, gray, moist, very dense	45	18	20-35-49 N=84	12		12
48.5	-31.5+/-		1	50/1"	13		21
	DOLOMITE, slightly fractured, thin bedding, unweathered, very strong Unconfined Compression Test at 51' Unit weight = 172 pcf Uniaxial Compressive Strength = 16,417 psi	50	120	Rec. = 100% RQD = 90%	RUN 1		
		55					
58.5	-41.5+/-						
	Boring Terminated at 58.5 Feet						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock. Bedrock cored with NX diamond core barrel.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

▽ *11' while drilling*

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-05-2018 | Boring Completed: 10-05-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

Rock Core Photograph – Boring B-15 – Run #1
Green Era Biotechnology Plant ■ Chicago, Illinois
October 22, 2018 ■ Terracon Project No. MR175403R1

Terracon

Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying Stress and Temperatures
ASTM D 7012
Method C

Laboratory Services Group *192 Exchange Boulevard* *Glendale Heights, Illinois 60139* *Phone: (630) 717-4263*

Project No.:	MR175403	Tested By:	BCM	Date:	10/18/18
Project Name:	Green Era Biotechnology Plant	Calculated By:	BCM	Date:	10/18/18
Boring No.	B-15 Sample: Core	Checked By:	WPQ	Date:	10/18/18
Depth (ft):	50.0'-51.0'				
Description:	Light Gray Rock Core				

Rock Sample Moisture Condition at Test: [X] As Received [ ] See Remarks [ ] Saturated [ ] Oven Dry

TOLERANCE CHECK

Side Straightness		Maxumum Gap ≤ 0.020 in						Tolerance Met	PASS
End Flatness: Max.	Diameter 1a	0.0019	in	Diameter 1b	0.0017	in	≤ 0.002 in	Tolerance Met	PASS
End Flatness: Max.	Diameter 2a	0.0016	in	Diameter 2b	0.0015	in	≤ 0.002 in	Tolerance Met	PASS
Perpendicularity Slope	Diameter 1a	0.0033		Diameter 1b	0.0031		≤ 0.0043	Tolerance Met	PASS
Perpendicularity Slope	Diameter 2a	0.0037		Diameter 2b	0.0040		≤ 0.0043	Tolerance Met	PASS

Length (mm): 1) 3.995 2) 3.994 3) 3.999 Avg. 3.996 in

Diameter (mm): 1) 1.947 2) 1.954 3) 1.949 Avg. 1.950 in

Uniaxial Compressive Strength: **16,417** psi Mass 538.78 grams

Load: **49,020** lbs Mass 1.188 lb

L/D: **2.0** **Unit Weight:** **172.0** pcf

YOUNG'S MODULUS	
E_t (50% Co)	-

POISSON'S RATIO	
u_t (50% Co)	-

REMARKS:

Before

After

BORING LOG NO. B-16

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7443° Longitude: -87.6408°

Approximate Surface Elev: 17 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DESCRIPTION
0.3	16.5+/-	**GRAVEL SURFACE**, 3 inches
		FILL - SILTY SAND, some gravel, clay, brick, and wood, gray and dark brown
		Sample 2: predominately clay
8.0	9+/-	**SILTY SAND (SM)**, trace gravel, gray, moist, loose
10.5	6.5+/-	**LEAN CLAY (CL)**, trace sand and gravel, gray, medium stiff to stiff
21.0	-4+/-	**SILTY LEAN CLAY (CL)**, trace sand and gravel, gray, hard

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
			15	5-8-4 N=12	1			32	
5			18	6-7-8 N=15	2	3.50 (HP)		18	
			9	5-5-3 N=8	3			24	
			15	2-1-2 N=3	4			27	
10	▽		18	2-1-1 N=2	5	0.75 (HP)		23	
			18	1-2-3 N=5	6	0.50 (HP)		23	
15									
20	▽		18	4-4-4 N=8	7	1.75 (HP)		20	
			0	21-10-10 N=20	8				
25									
			15	13-10-12 N=22	9	5.50 (HP)		13	
30									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

▽ *11' while drilling*

▽ *20' upon completion*

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-03-2018 | Boring Completed: 10-03-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-16

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7443° Longitude: -87.6408°

Approximate Surface Elev: 17 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
		SILTY LEAN CLAY (CL), trace sand and gravel, gray, hard *(continued)*										
			35			18	9-11-16 N=27	10	5.00 (HP)		13	
38.0	-21+/-											
		SILTY SAND (SM), trace gravel, gray, moist, medium dense										
			40			18	6-8-10 N=18	11			17	
42.0	-25+/-											
		SILTY CLAY (CL/ML), trace gravel, gray, moist, hard										
			45			18	21-40-45 N=85	12	6.00 (HP)		11	
48.5	-31.5+/-											
49.0	-32+/-	**APPARENT BEDROCK**				1	50/2"	13			10	
		Boring Terminated at 49 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

11' while drilling

20' upon completion

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-03-2018 | Boring Completed: 10-03-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-17

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7447° Longitude: -87.641°

Approximate Surface Elev: 16.5 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
0.3	16+/-											
WOOD CHIPS, 3 inches												
FILL - SILTY SAND, trace clay, gravel, organics, and brick, dark brown to black, moist					X	8	7-16-18 N=34	1			20	
Sample 2: pounded rock, no recovery.			5		X	0	18-13-6 N=19	2				
					X	16	8-6-4 N=10	3			33	
8.0	8.5+/-			▽								
LEAN CLAY WITH SAND (CL), trace gravel and organics, dark gray, moist, medium stiff					X	18	3-1-1 N=2	4	0.50 (HP)		29	
10.5	6+/-		10	▽								
LEAN CLAY (CL), trace sand and gravel, gray, medium stiff					X	18	2-1-2 N=3	5	0.50 (HP)		18	
					X	14	4-2-2 N=4	6	0.75 (HP)		22	
18.0	-1.5+/-		15									
SILTY LEAN CLAY (CL), trace sand and gravel, gray, very stiff to hard					X	18	2-4-7 N=11	7	2.50 (HP)		15	
Sample 8: pounded rock, no recovery.			20		X	0	13-13-14 N=27	8				
			25		X	18	7-7-11 N=18	9	3.50 (HP)		15	
			30									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

▽ *8' while drilling*

▽ *11' upon completion*

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-02-2018 | Boring Completed: 10-02-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-17

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7447° Longitude: -87.641°

Approximate Surface Elev: 16.5 (Ft.) +/-

DEPTH	ELEVATION (Ft.)		DEPTH (Ft.)	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	WATER CONTENT (%)
		SILTY LEAN CLAY (CL), trace sand and gravel, gray, very stiff to hard *(continued)*							
			35		18	6-7-10 N=17	10	4.00 (HP)	15
37.0	-20.5+/-	**SILT (ML)**, trace clay and gravel, gray, wet, dense							
			40		6	7-18-20 N=38	11		17
41.0	-24.5+/-	**SILTY CLAY (CL/ML)**, trace gravel, gray, moist, hard							
			45		18	33-35-49 N=84	12	6.00 (HP)	12
48.5	-32+/-								
49.0	-32.5+/-	**APPARENT BEDROCK**			1	50/5"	13		14
		Boring Terminated at 49 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

8' while drilling

11' upon completion

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-02-2018 | Boring Completed: 10-02-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-18

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7446° Longitude: -87.6407°

Approximate Surface Elev: 16.5 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description
0.3	16+/-	**GRAVEL SURFACE**, 3 inches
		FILL - SILTY SAND, some gravel, clay, brick, and wood, gray and dark brown
		Sample 2: predominately clay
8.0	8.5+/-	**LEAN CLAY (CL)**, trace sand and gravel, gray, medium stiff
18.0	-1.5+/-	**LEAN CLAY (CL)**, trace sand and gravel, gray, very stiff
22.0	-5.5+/-	**SILTY LEAN CLAY (CL)**, trace sand and gravel, gray, hard

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
			12	6-10-8 N=18	1			12	
			18	4-4-6 N=10	2	6.00 (HP)		16	
5			10	4-3-2 N=5	3			23	
	▽		18	3-2-1 N=3	4	0.75 (HP)		29	
10									
	▽		18	1-1-1 N=2	5	0.50 (HP)		24	
			18	1-1-2 N=3	6	0.50 (HP)		24	
15									
			18	2-2-4 N=6	7	2.50 (HP)		14	
20									
			18	6-8-7 N=15	8	6.50 (HP)		13	
25									
			18	8-9-11 N=20	9	4.00 (HP)		14	
30									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

▽ *11.5' while drilling*

▽ *8' upon completion*

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-03-2018 | Boring Completed: 10-03-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-18

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7446° Longitude: -87.6407°

Approximate Surface Elev: 16.5 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DESCRIPTION
		SILTY LEAN CLAY (CL), trace sand and gravel, gray, hard *(continued)*
38.0	-21.5+/-	
		GRAVELLY SILT (ML), trace clay, gray, wet, medium dense
41.0	-24.5+/-	
		SILT (ML), trace sand and gravel, gray, moist, very dense
48.5	-32+/-	
49.0	-32.5+/-	**APPARENT BEDROCK**
		Boring Terminated at 49 Feet

DEPTH (Ft.)	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
35		17	6-8-11 N=19	10	4.00 (HP)		14	
40		10	7-11-6 N=17	11			8	
45		17	36-35-42 N=77	12			11	
		3	50/3"	13			10	

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

11.5' while drilling

8' upon completion

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-03-2018 | Boring Completed: 10-03-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-19

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7449° Longitude: -87.6408°

Approximate Surface Elev: 16 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
0.3	15.5+/-											
TOPSOIL, 4 inches												
FILL - SILTY SAND, trace clay and gravel, dark brown to gray, moist					X	3	6-8-9 N=17	1			11	
					X	10	5-3-3 N=6	2	2.00 (HP)		18	
Sample 2: predominately clay.			5									
				▽	X		3-5-3 N=8	3			31	
Sample 3: pushed rock, limited recovery.												
8.0	8+/-											
LEAN CLAY (CL), trace sand and gravel, gray, soft to medium stiff					X	13	1-1-1 N=2	4	0.25 (HP)		36	
			10									
					X	15	1-2-2 N=4	5	0.50 (HP)		25	
					X	18	1-1-2 N=3	6	0.50 (HP)		23	
			15									
18.0	-2+/-											
LEAN CLAY (CL), trace sand and gravel, gray, very stiff					■			7	2.25 (HP)	2.03	19	107
			20									
22.0	-6+/-											
SILTY LEAN CLAY (CL), trace sand and gravel, gray, hard												
					X	18	4-7-10 N=17	8	5.00 (HP)		14	
			25									
					X	18	5-7-10 N=17	9	6.00 (HP)		13	
			30									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock. Bedrock cored with NX diamond core barrel.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

▽ *7' while drilling*

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-08-2018 | Boring Completed: 10-08-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-19

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7449° Longitude: -87.6408°

Approximate Surface Elev: 16 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	WATER CONTENT (%)
SILTY LEAN CLAY (CL), trace sand and gravel, gray, hard *(continued)*							
		35	18	6-9-10 N=19	10	5.00 (HP)	14
		40	18	5-10-12 N=22	11	3.75 (HP)	15
41.0	-25+/-						
SILT (ML), trace clay and gravel, gray, moist, dense to very dense		45	18	6-13-28 N=41	12		9
48.5	-32.5+/-		7	36-50/1"	13		9
DOLOMITE, slightly fractured, thin bedding, unweathered, strong rock Unconfined Compression Test at 51' Unit weight = 172 pcf Uniaxial Compressive Strength = 13,155 psi		50 55	120	Rec. = 81% RQD = 100%	RUN 1		
59.0	-43+/-						
Boring Terminated at 59 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock. Bedrock cored with NX diamond core barrel.

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

▽ 7' while drilling

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-08-2018 | Boring Completed: 10-08-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

Rock Core Photograph – Boring B-19 – Run #1
Green Era Biotechnology Plant ■ Chicago, Illinois
October 22, 2018 ■ Terracon Project No. MR175403R1

Terracon

Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying Stress and Temperatures
ASTM D 7012
Method C

Laboratory Services Group *192 Exchange Boulevard* *Glendale Heights, Illinois 60139* *Phone: (630) 717-4263*

Project No.:	MR175403	Tested By:	BCM	Date:	10/18/18
Project Name:	Green Era Biotechnology Plant	Calculated By:	BCM	Date:	10/18/18
Boring No.	B-19 Sample: Core	Checked By:	WPQ	Date:	10/18/18
Depth (ft):	50.0'-51.0'				
Description:	Light Gray Rock Core				

Rock Sample Moisture Condition at Test: [X] As Received [ ] See Remarks [ ] Saturated [ ] Oven Dry

TOLERANCE CHECK

Side Straightness		Maxumum Gap ≤ 0.020 in						Tolerance Met	PASS
End Flatness: Max.	Diameter 1a	0.0020	in	Diameter 1b	0.0017	in	≤ 0.002 in	Tolerance Met	PASS
End Flatness: Max.	Diameter 2a	0.0016	in	Diameter 2b	0.0014	in	≤ 0.002 in	Tolerance Met	PASS
Perpendicularity Slope	Diameter 1a	0.0042		Diameter 1b	0.0039		≤ 0.0043	Tolerance Met	PASS
Perpendicularity Slope	Diameter 2a	0.0037		Diameter 2b	0.0035		≤ 0.0043	Tolerance Met	PASS

Length (mm):	1)	3.995	2)	3.994	3)	3.999	Avg.	3.996 in
Diameter (mm):	1)	1.947	2)	1.954	3)	1.949	Avg.	1.950 in

Uniaxial Compressive Strength: **13,155** psi Mass 537.85 grams

Load: **39,280** lbs Mass 1.186 lb

L/D: **2.0** **Unit Weight:** **171.7** pcf

YOUNG'S MODULUS	
E_t (50% Co)	-

POISSON'S RATIO	
u_t (50% Co)	-

REMARKS:

Before

After

BORING LOG NO. B-20

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7449° Longitude: -87.6411°

Approximate Surface Elev: 16 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	STRATIGRAPHIC DESCRIPTION
0.3	15.5+/-	**GRAVEL SURFACE**, 3 inches
		FILL - SILTY CLAY, trace brick and gravel, dark gray and brown
3.0	13+/-	
		POSSIBE FILL - SILTY SAND (SM), trace gravel, dark brown to gray, moist, medium dense
6.0	10+/-	
		SILTY SAND (SM), trace clay and gravel, dark brown to gray, wet, loose
10.0	6+/-	
		LEAN CLAY (CL), trace sand and gravel, gray, medium stiff
22.0	-6+/-	
		SILTY LEAN CLAY (CL), trace sand and gravel, gray, very stiff to hard

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
		X	14	5-6-6 N=12	1	2.00 (HP)		16	
		X	15	4-6-4 N=10	2			18	
5									
	▽	X	10	3-2-2 N=4	3			29	
		X	5	1-1-1 N=2	4			21	
10									
		X	18	1-2-3 N=5	5	0.75 (HP)		24	
		X	18	2-2-2 N=4	6	0.75 (HP)		24	
15									
	▽								
		X	18	2-2-2 N=4	7	0.75 (HP)		22	
20									
		X	18	5-7-9 N=16	8	6.00 (HP)		13	
25									
		X	18	5-7-8 N=15	9	4.50 (HP)		15	
30									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

▽ *7' while drilling*

▽ *17' upon completion*

Terracon
650 W Lake St, Ste 420
Chicago, IL

Boring Started: 10-03-2018 | Boring Completed: 10-03-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

BORING LOG NO. B-20

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, Illinois

SITE: 650 W. 83rd St.
Chicago, Illinois

LOCATION See Exploration Plan

Latitude: 41.7449° Longitude: -87.6411°

Approximate Surface Elev: 16 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	LABORATORY HP (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)
	SILTY LEAN CLAY (CL), trace sand and gravel, gray, very stiff to hard *(continued)*										
		35		X	18	4-6-8 N=14	10	3.50 (HP)		16	
		40		X	18	4-5-8 N=13	11	4.00 (HP)		15	
42.0	-26+/-										
	SILT (ML), trace clay and gravel, gray, moist, very dense	45		X	18	23-40-47 N=87	12			10	
48.0	-32+/-			X	6	57-50/2"	13			5	
48.5	**APPARENT BEDROCK** -32.5+/-										
	Boring Terminated at 48.5 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" hollow stem auger to bedrock

Abandonment Method:
Boring backfilled with Auger Cuttings and/or Bentonite

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations estimated from a site topographic survey.

Notes:

WATER LEVEL OBSERVATIONS

7' while drilling

17' upon completion

Terracon
650 W Lake St, Ste 420
Chicago, IL

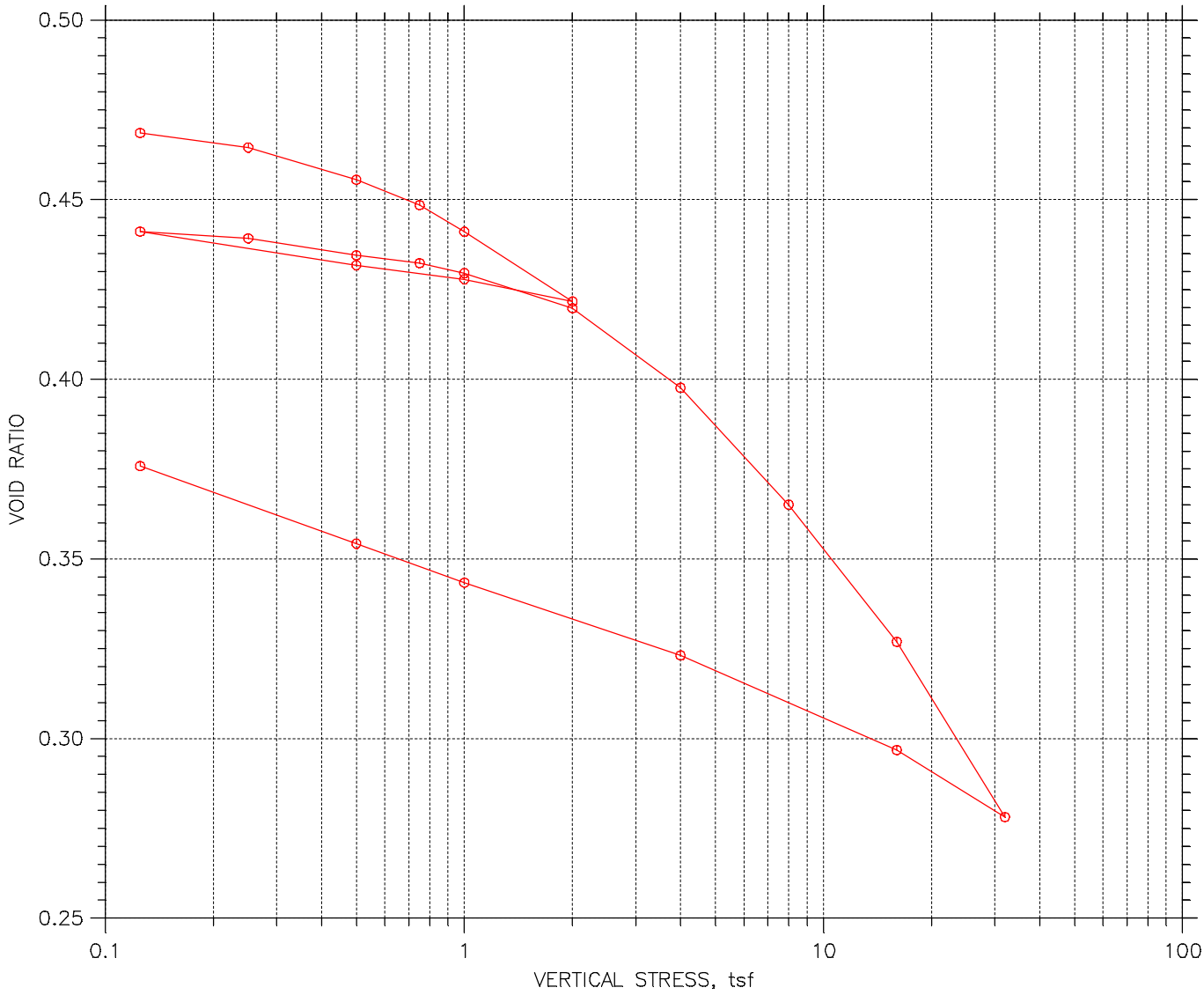
Boring Started: 10-03-2018 | Boring Completed: 10-03-2018

Drill Rig: D-120 | Driller: GEOCON/Robert

Project No.: MR175403

CONSOLIDATION TEST RESULTS

ONE DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS
USING INCREMENTAL LOADING
ASTM D2435

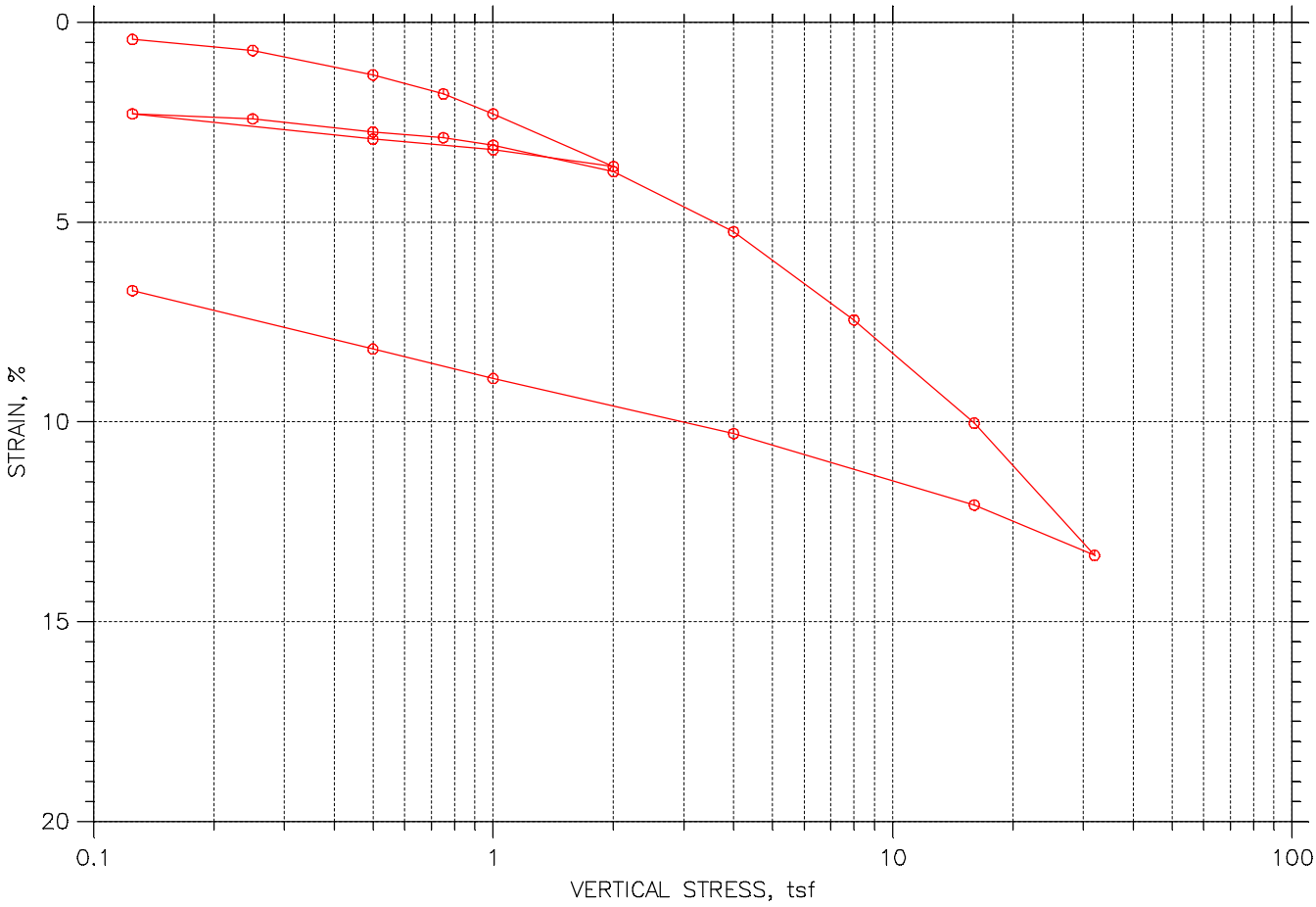


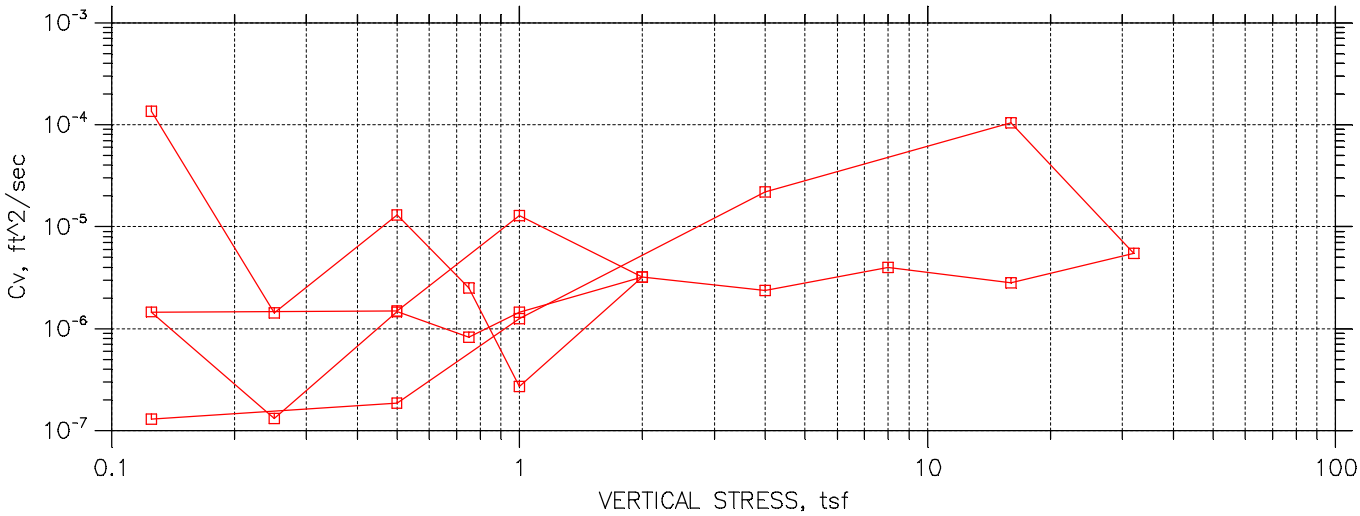
				Before Test	After Test
Overburden Pressure: 1.2 tsf			Water Content, %	15.32	13.76
Preconsolidation Pressure: 2.1 tsf			Dry Unit Weight, pcf	115.1	123.4
Compression Index: 0.11			Saturation, %	87.73	99.62
Diameter: 2.503 in		Height: 0.7524 in	Void Ratio	0.47	0.38
LL: 27	PL: 15	PI: 12	GS: 2.72		

Terracon
Consulting Engineers & Scientists

Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

ONE DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS
USING INCREMENTAL LOADING
ASTM D2435





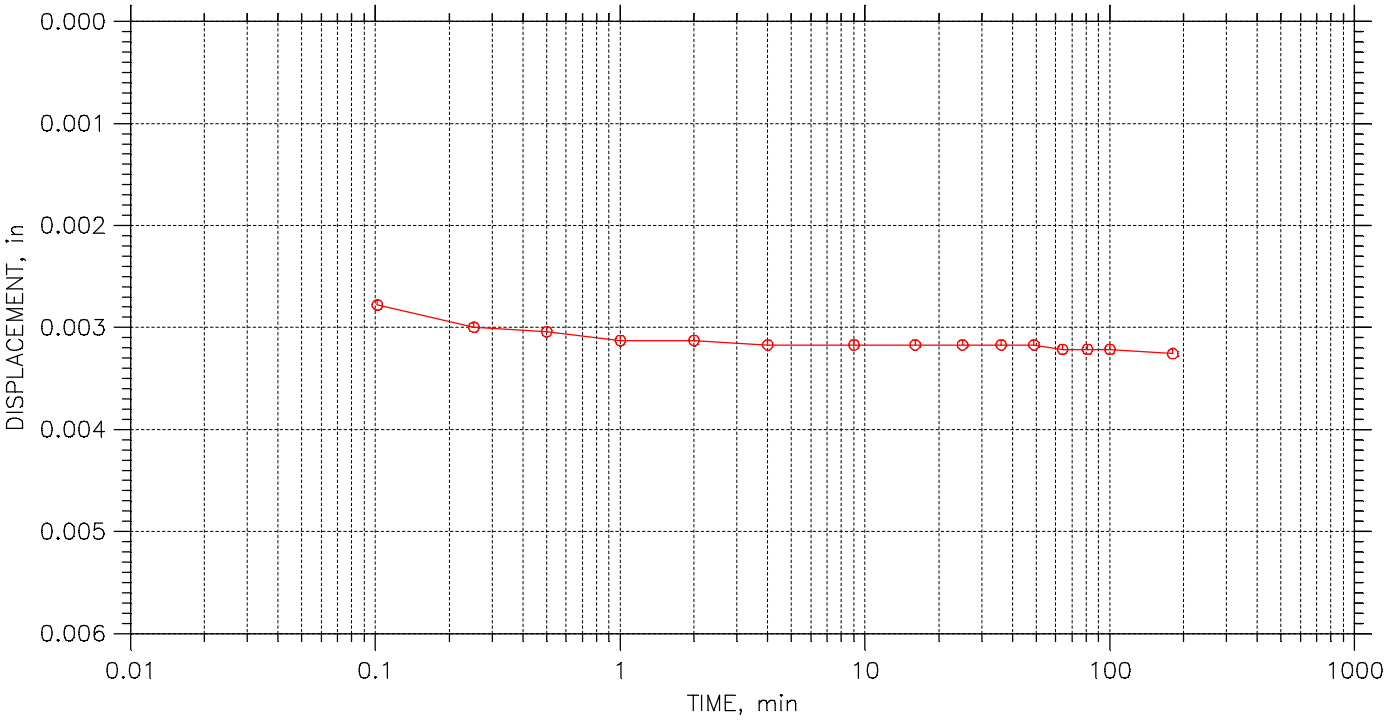
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

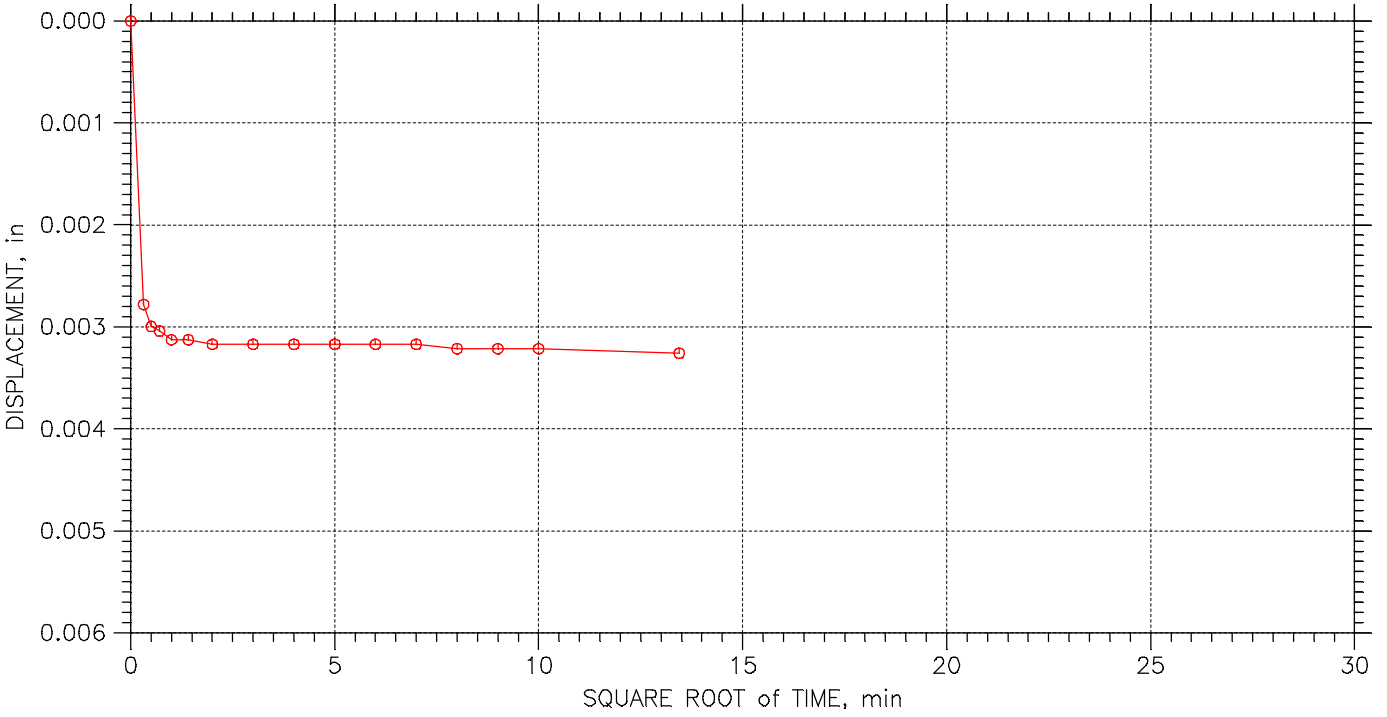
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 1 of 23

Stress: 0.125 tsf





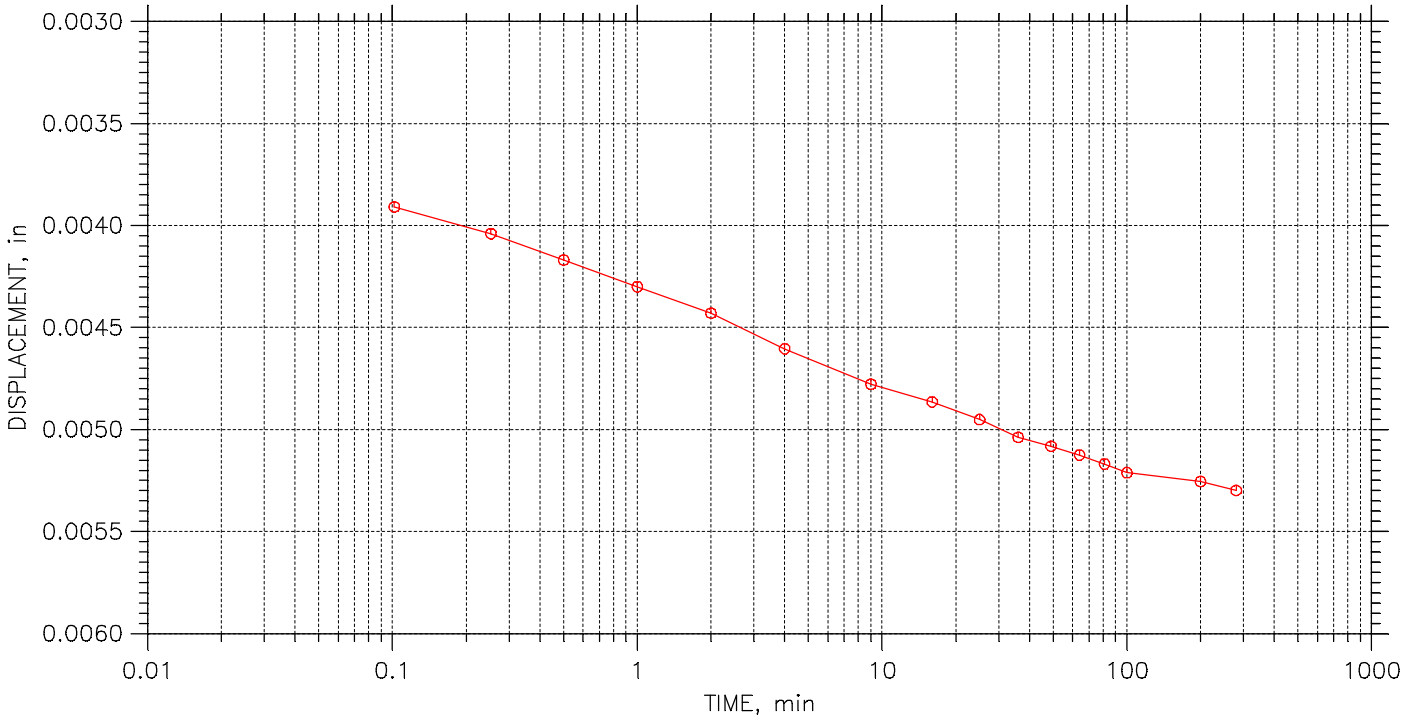
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

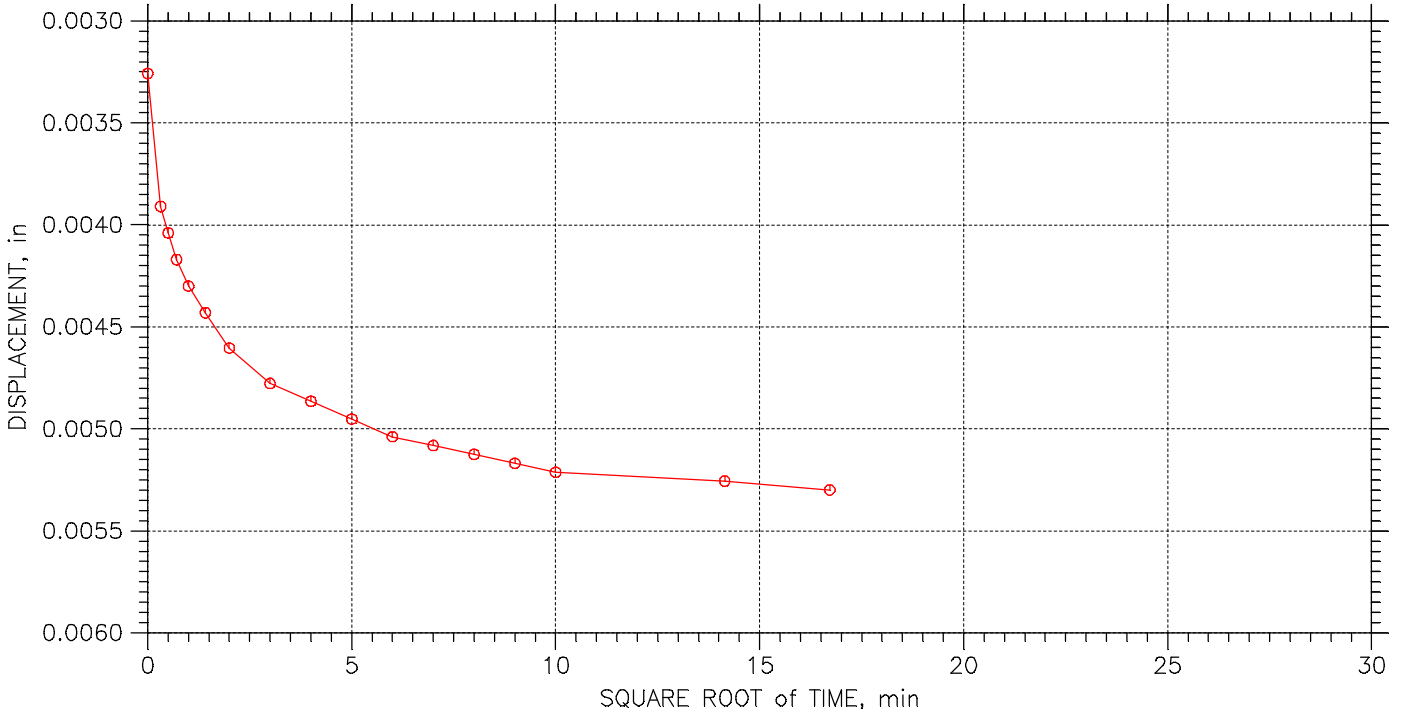
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 2 of 23

Stress: 0.25 tsf





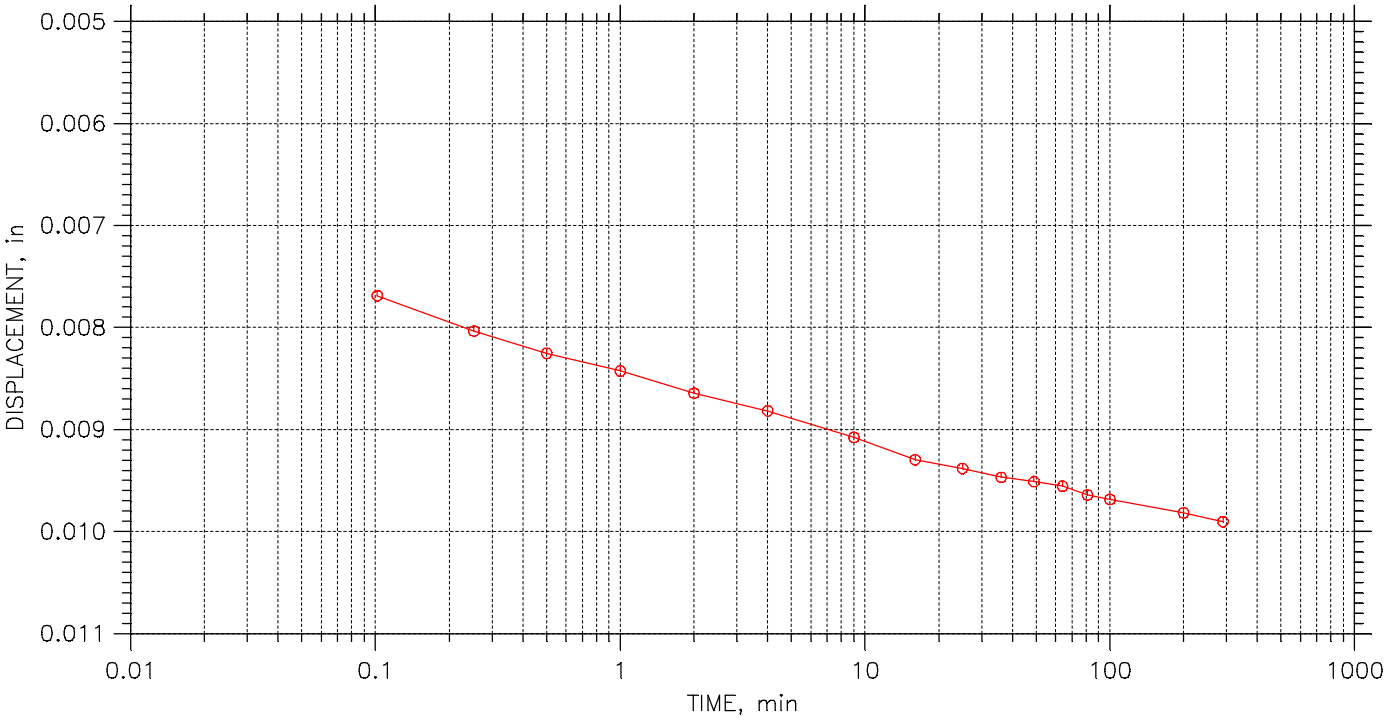
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

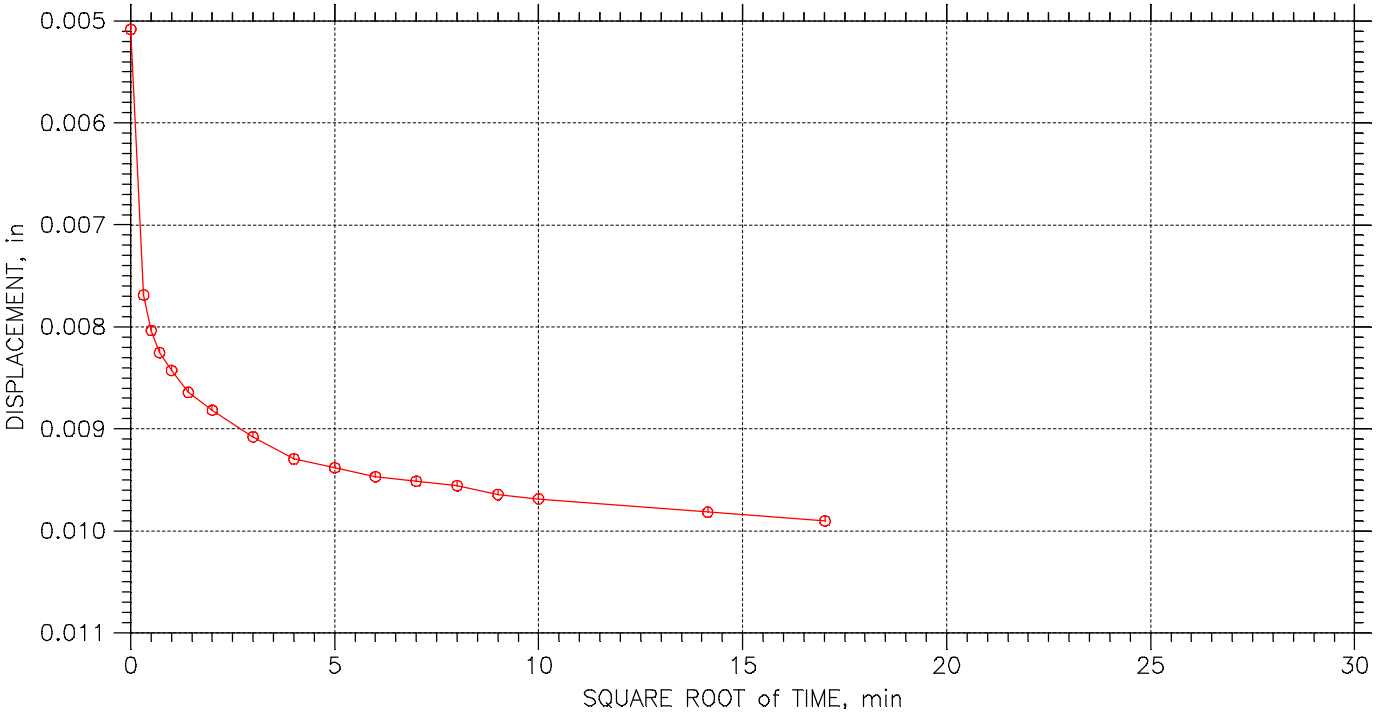
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 3 of 23

Stress: 0.5 tsf





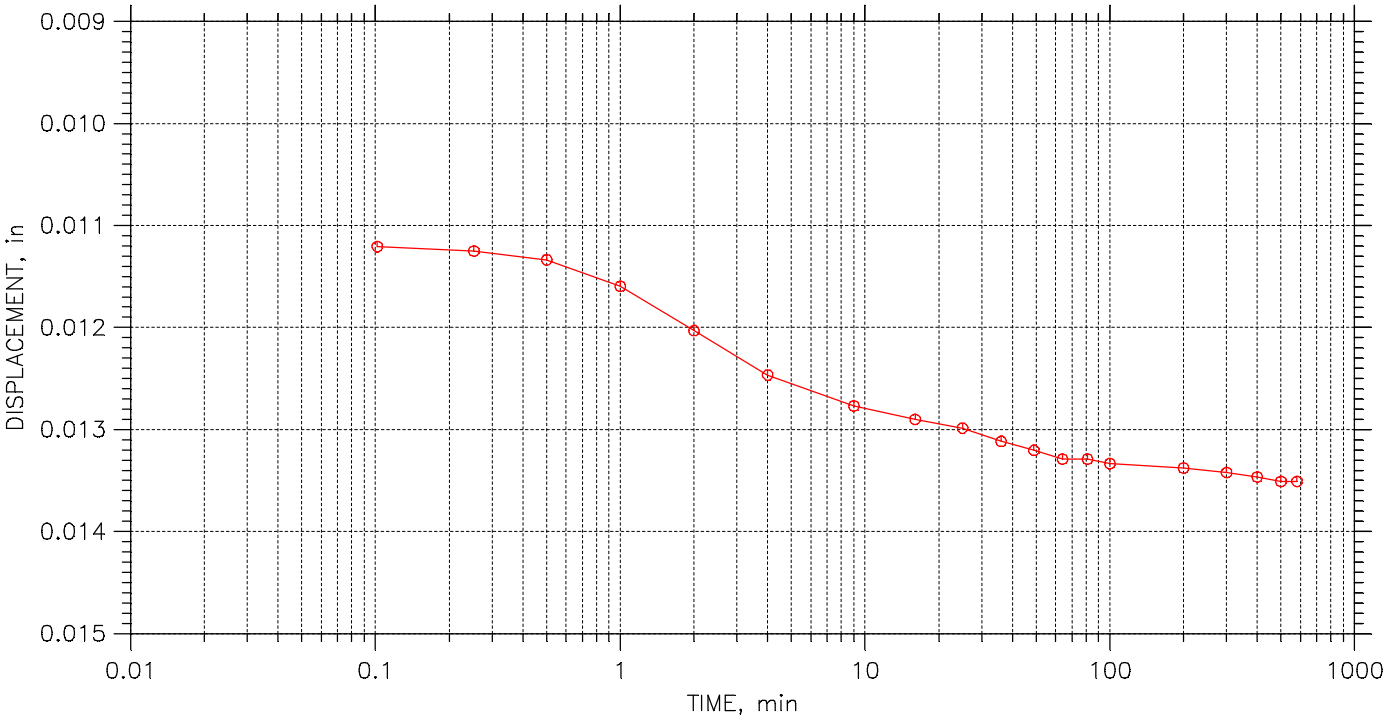
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

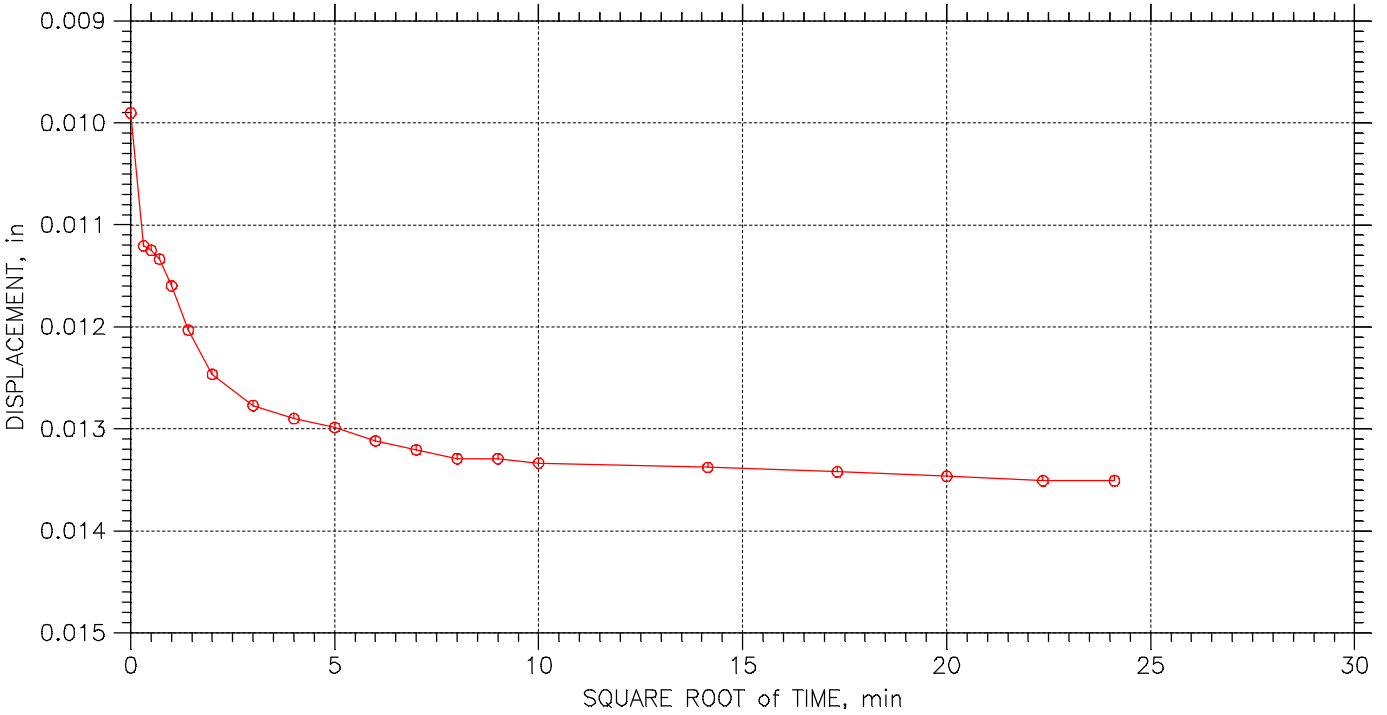
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 4 of 23

Stress: 0.75 tsf





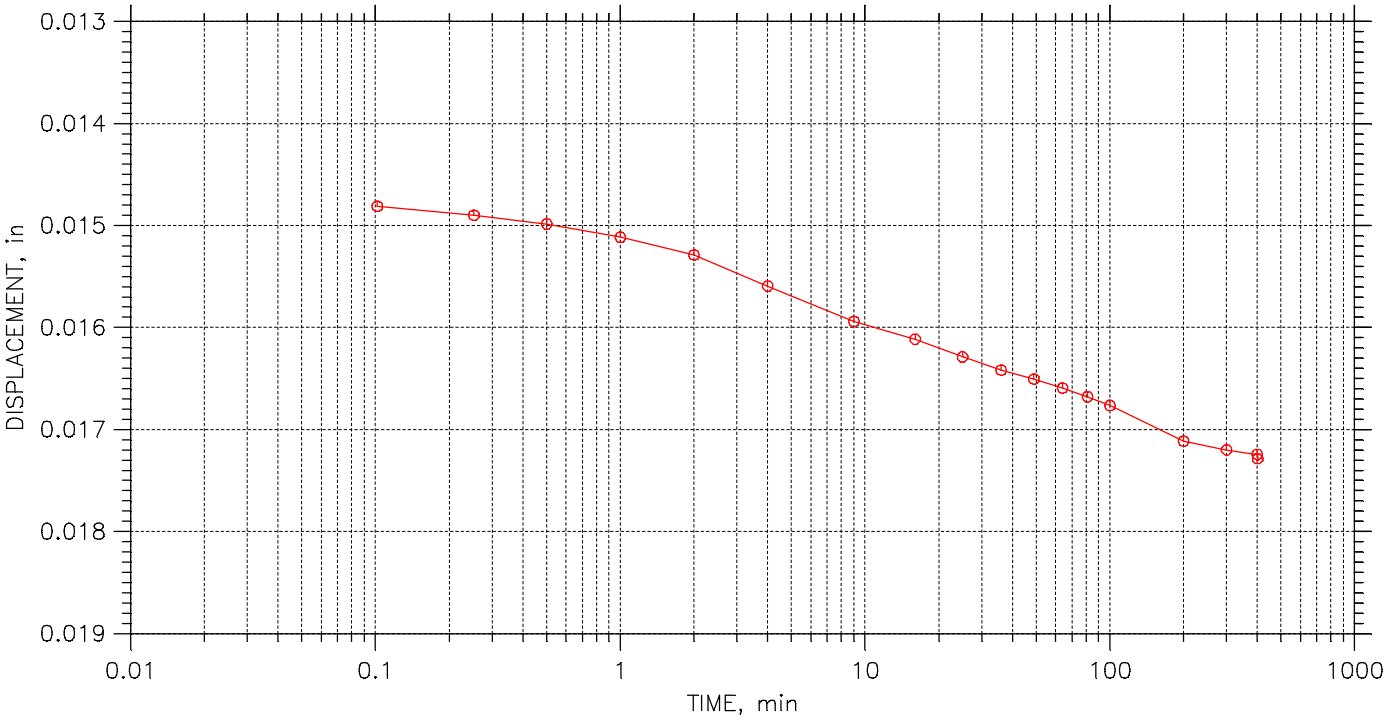
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

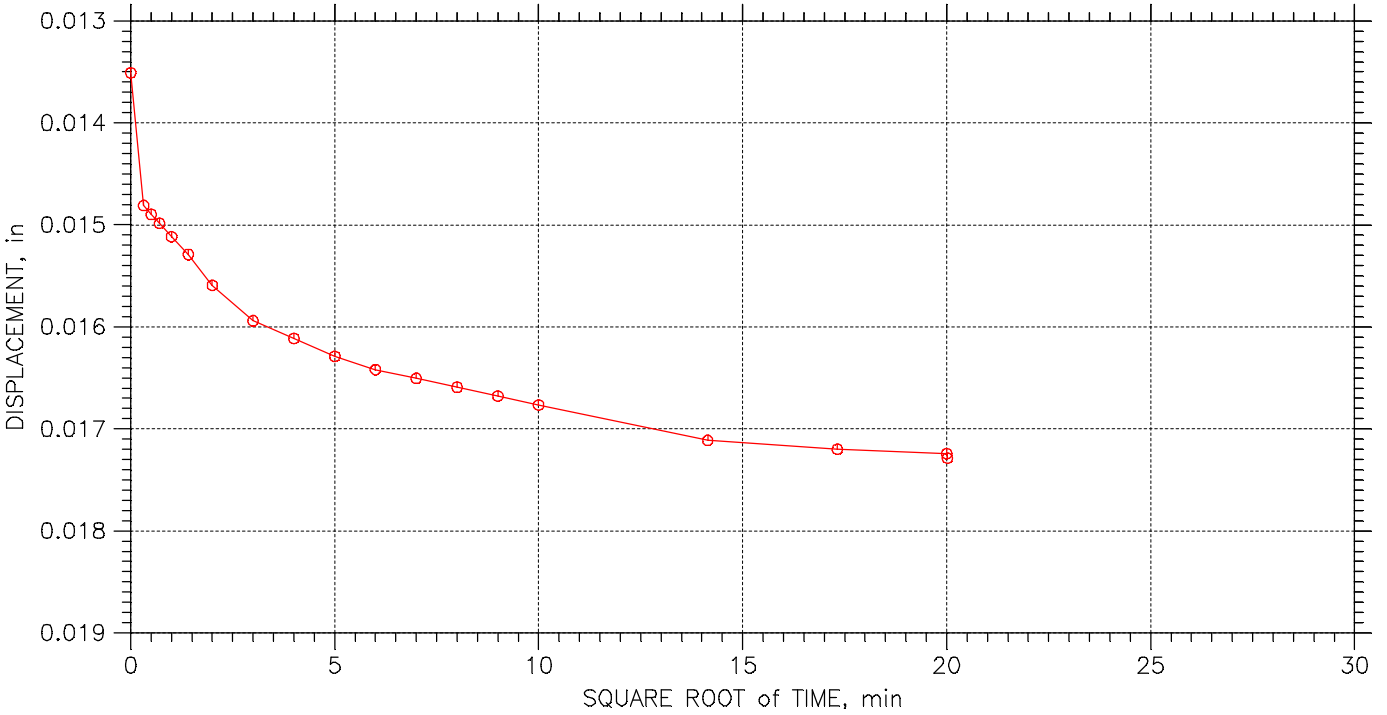
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 5 of 23

Stress: 1. tsf





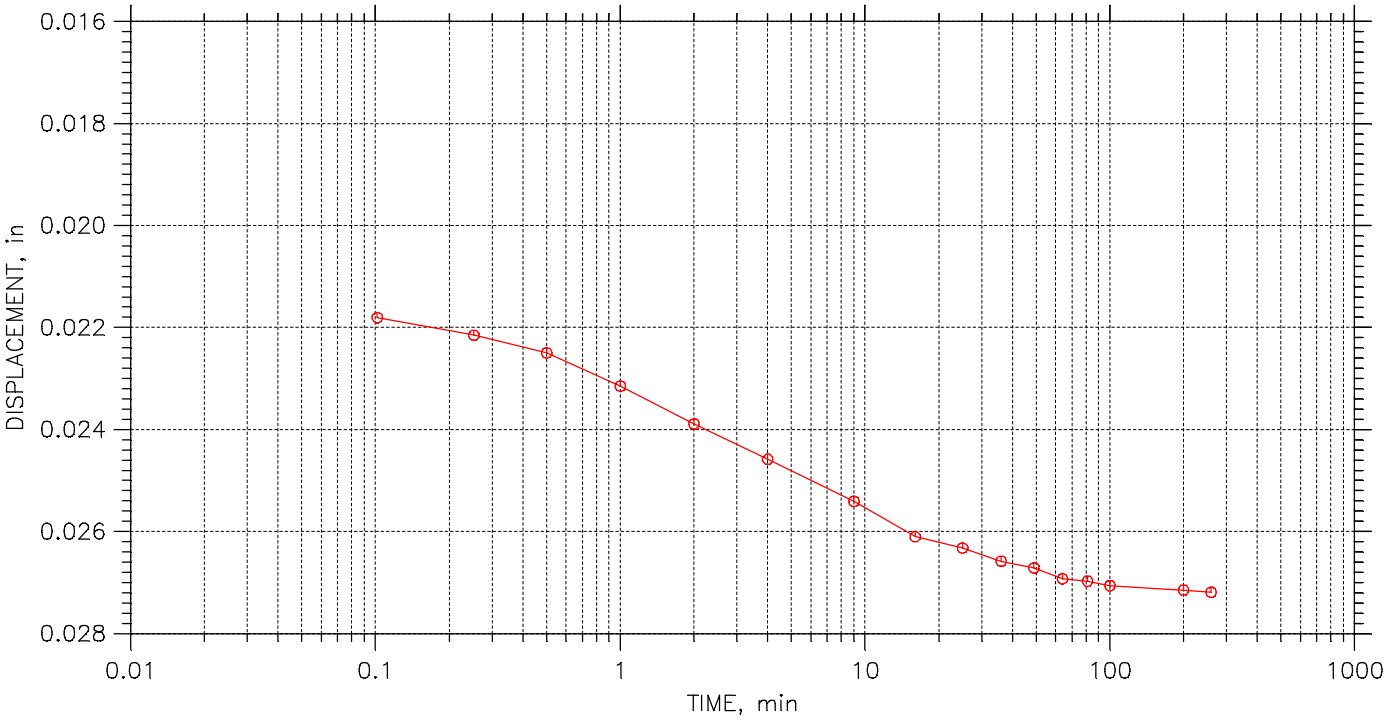
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

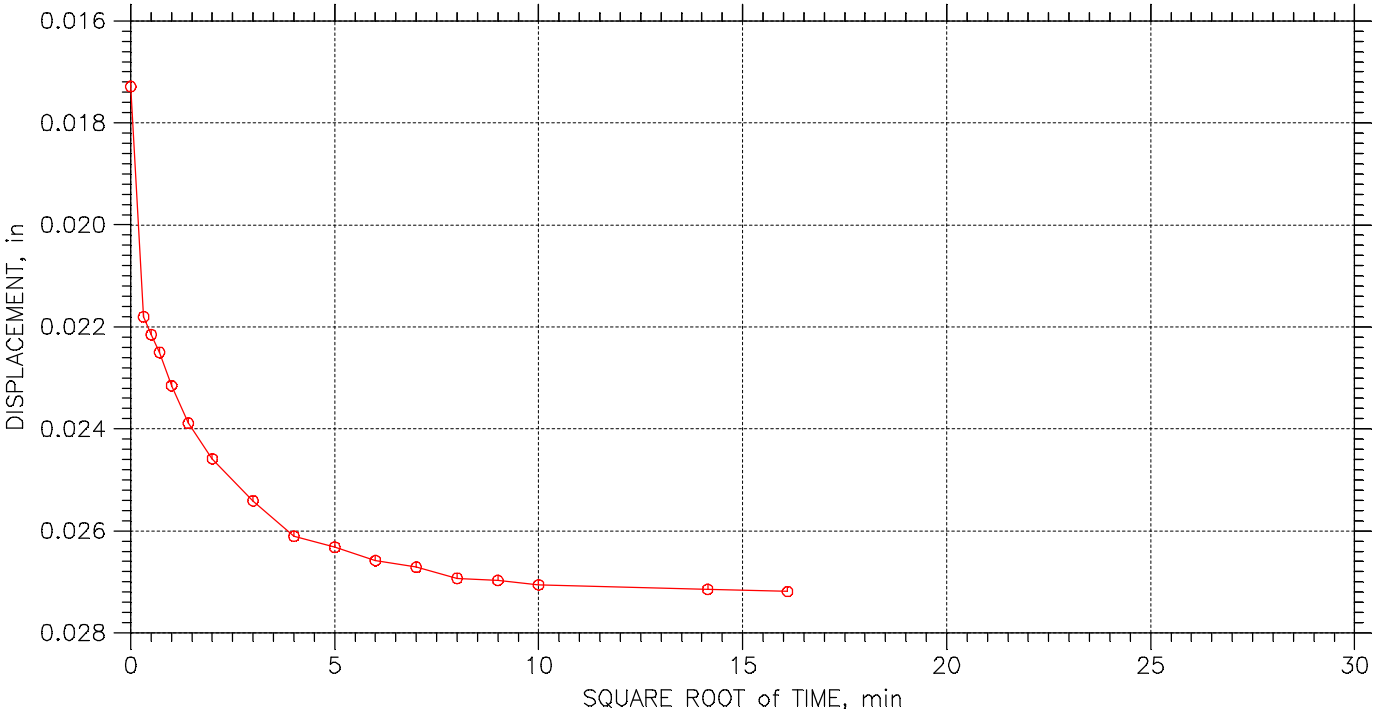
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 6 of 23

Stress: 2. tsf





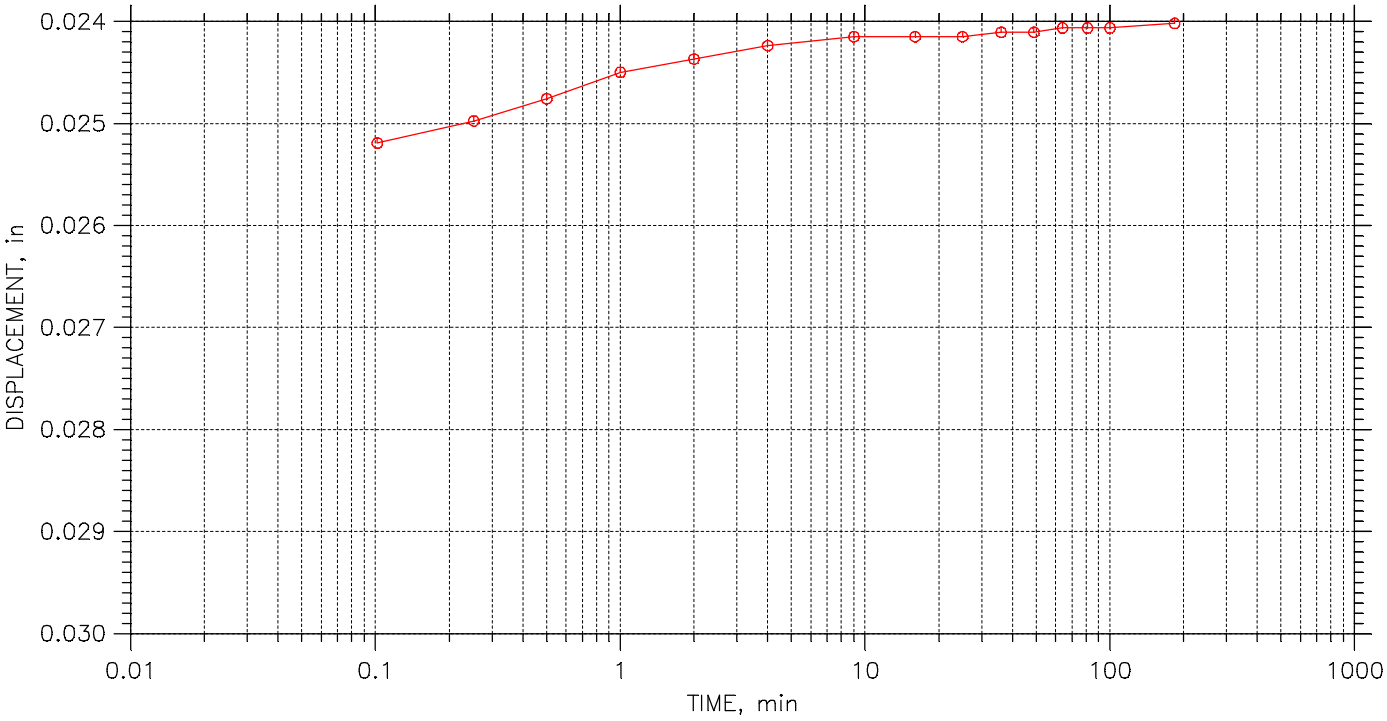
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

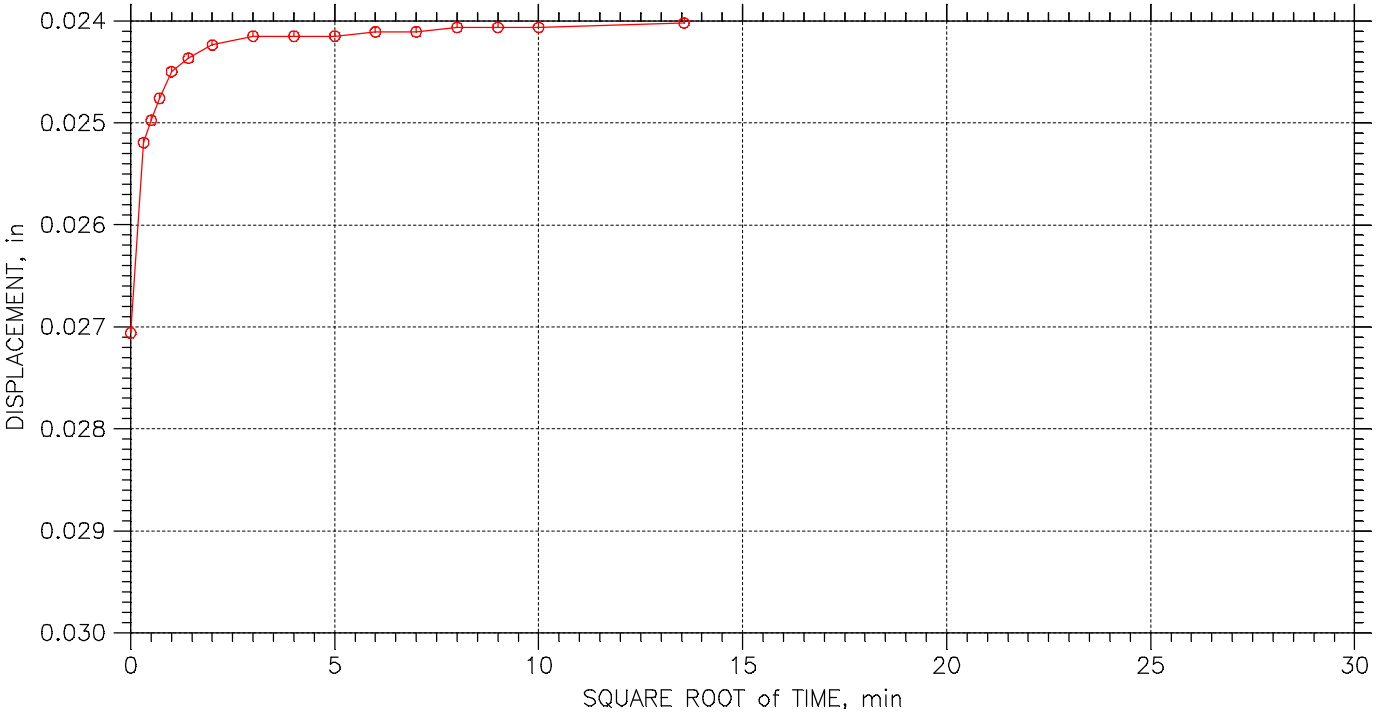
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 7 of 23

Stress: 1. tsf





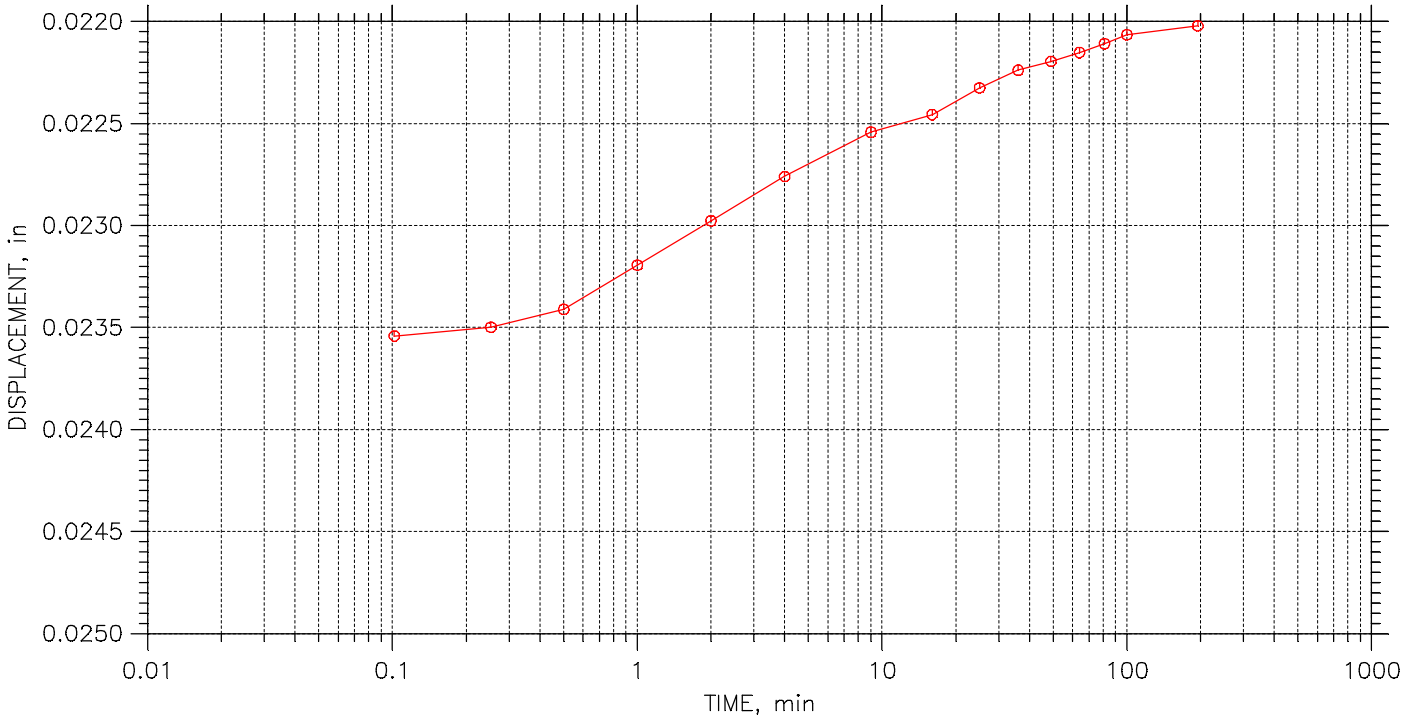
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

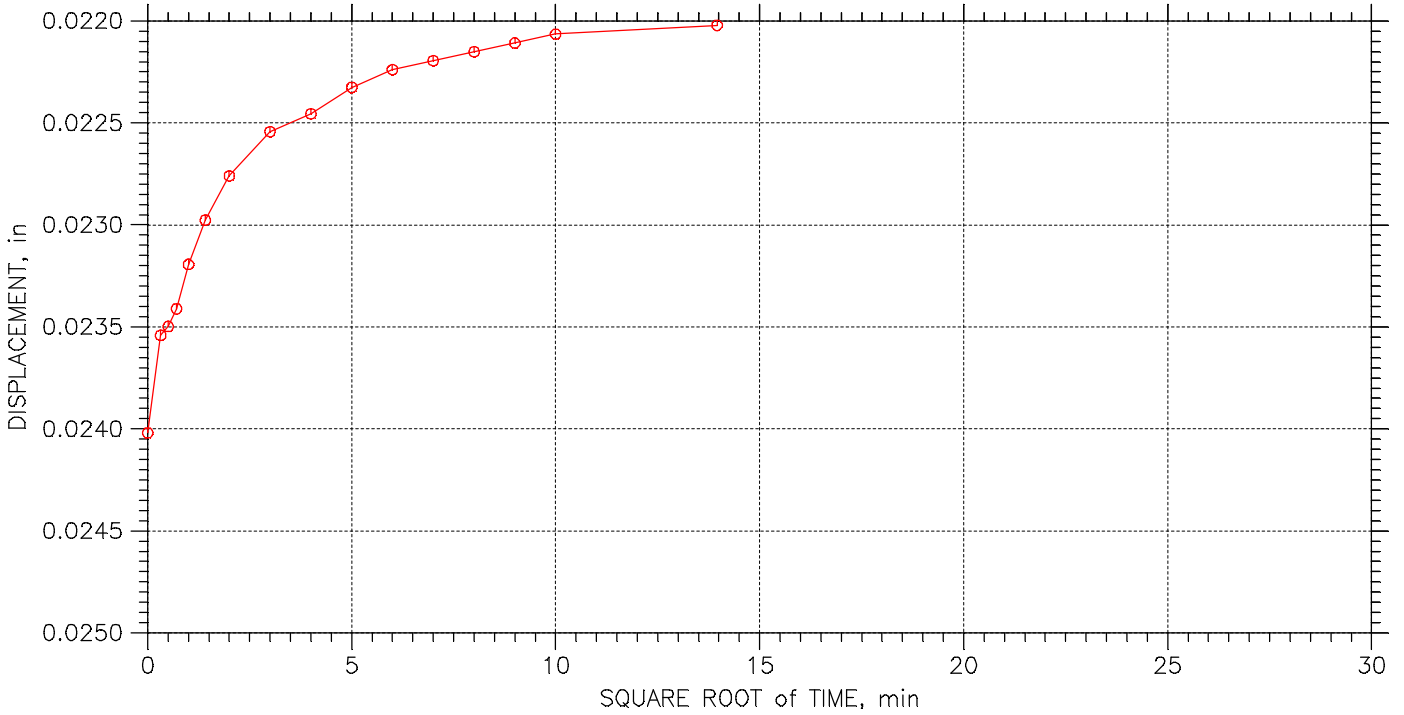
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 8 of 23

Stress: 0.5 tsf





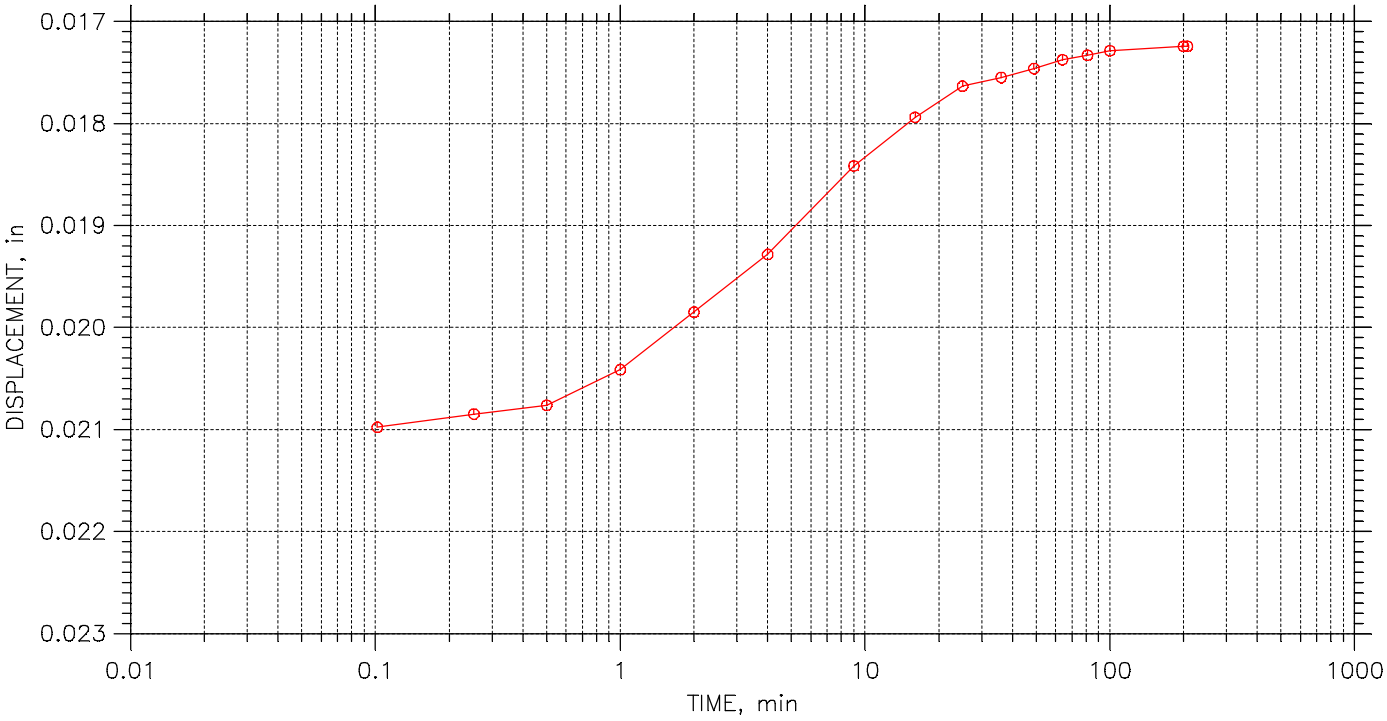
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

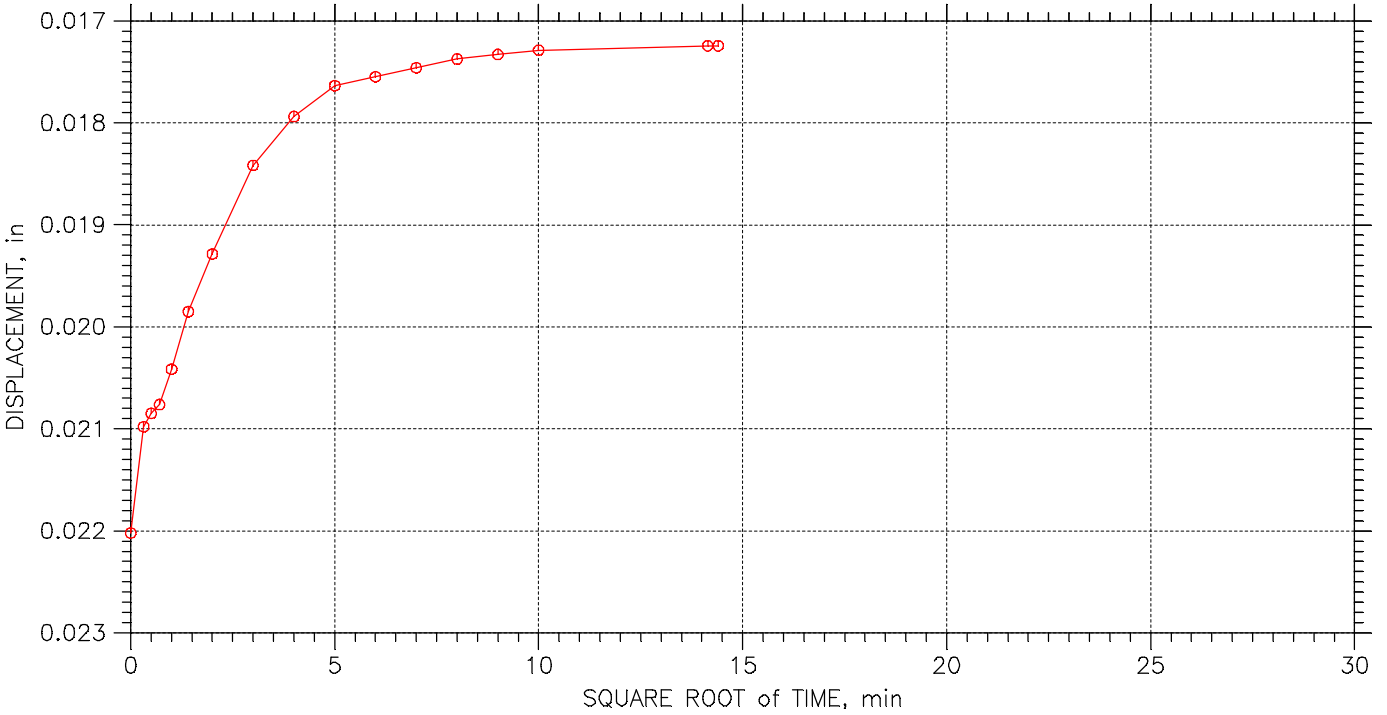
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 9 of 23

Stress: 0.125 tsf





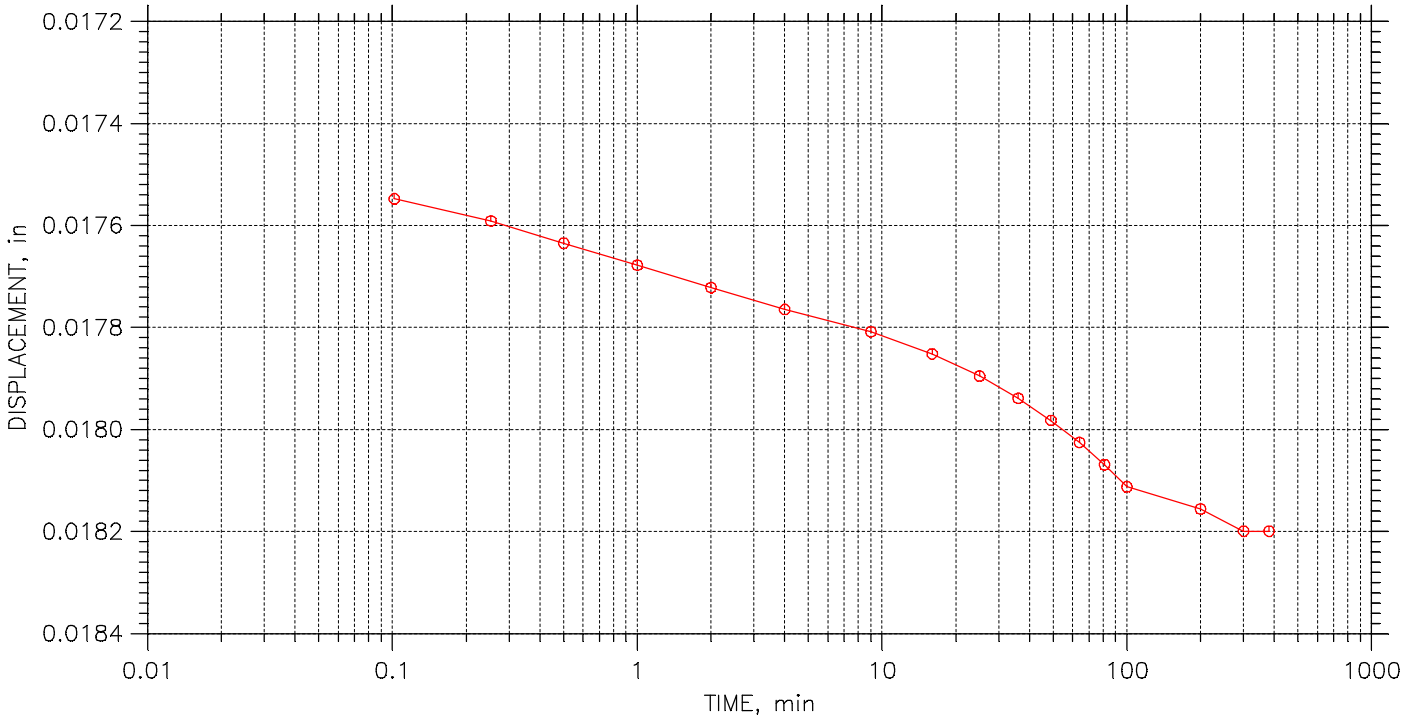
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

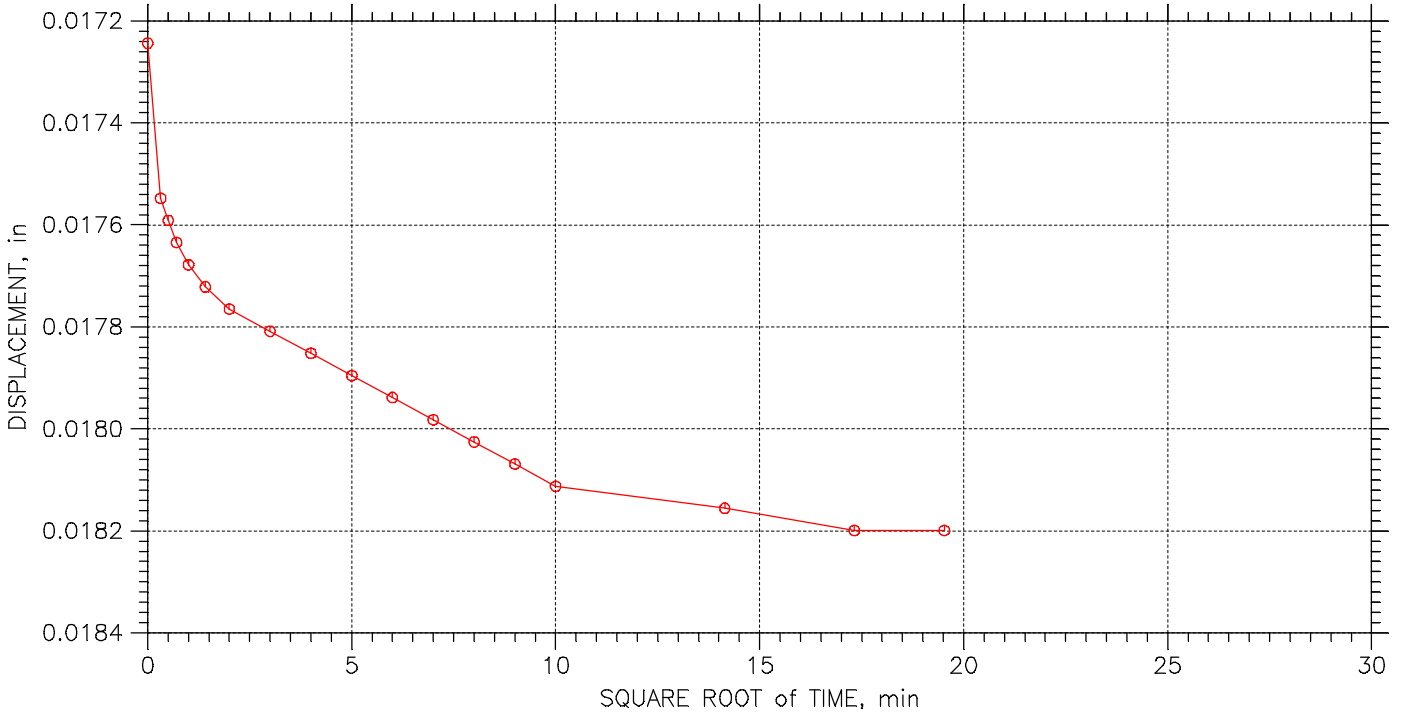
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 10 of 23

Stress: 0.25 tsf





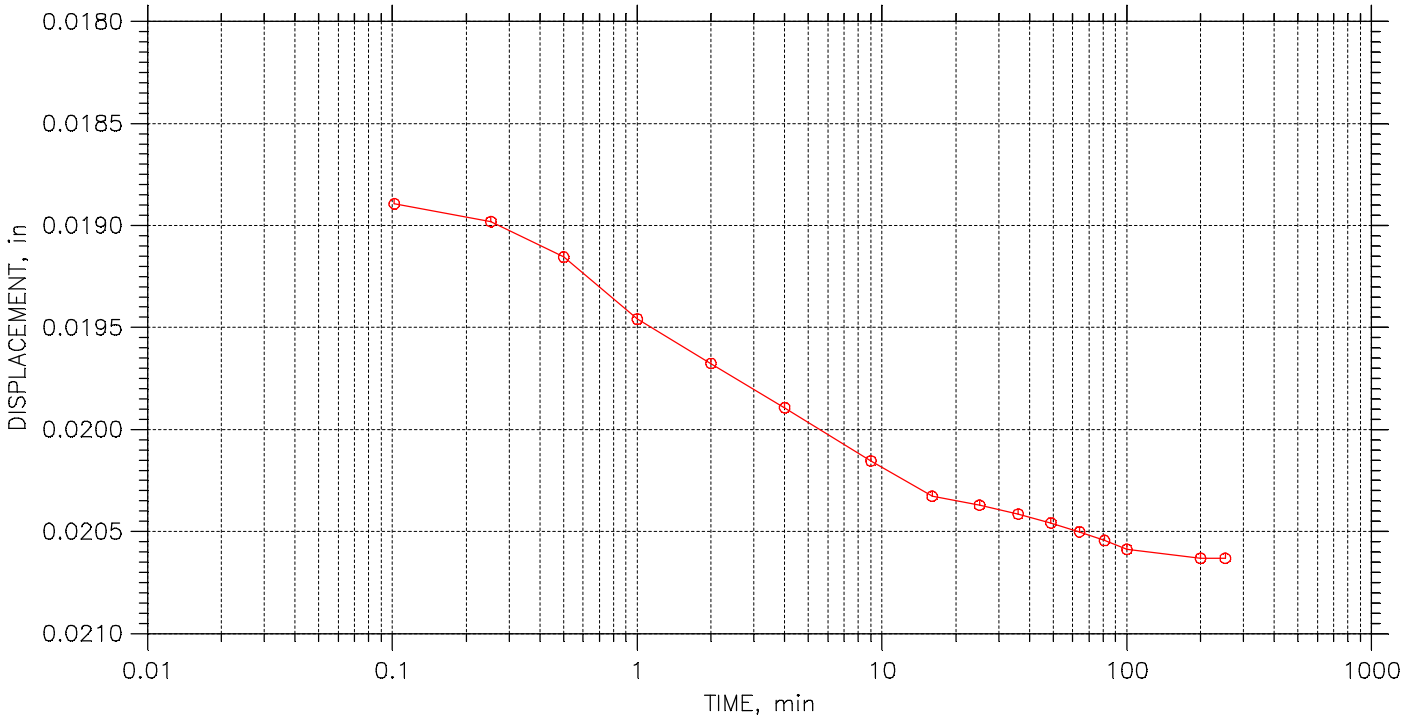
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

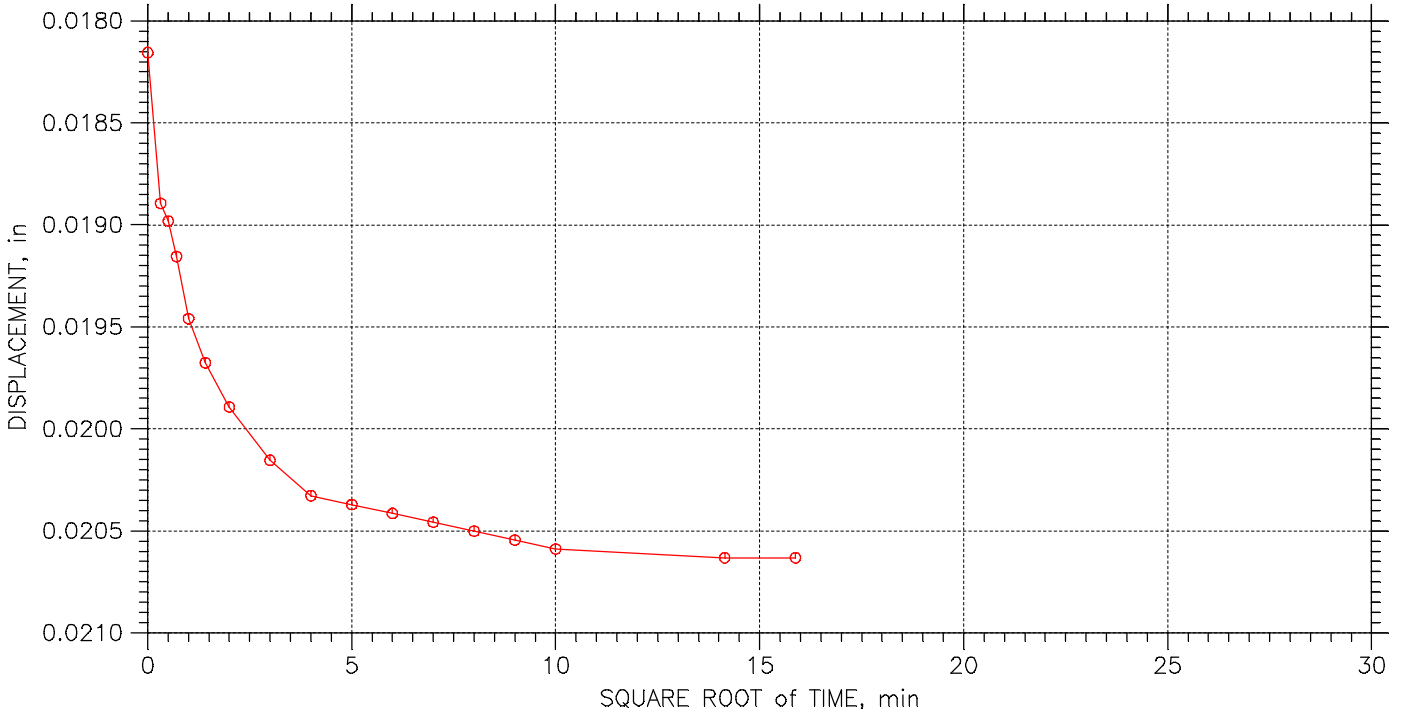
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 11 of 23

Stress: 0.5 tsf





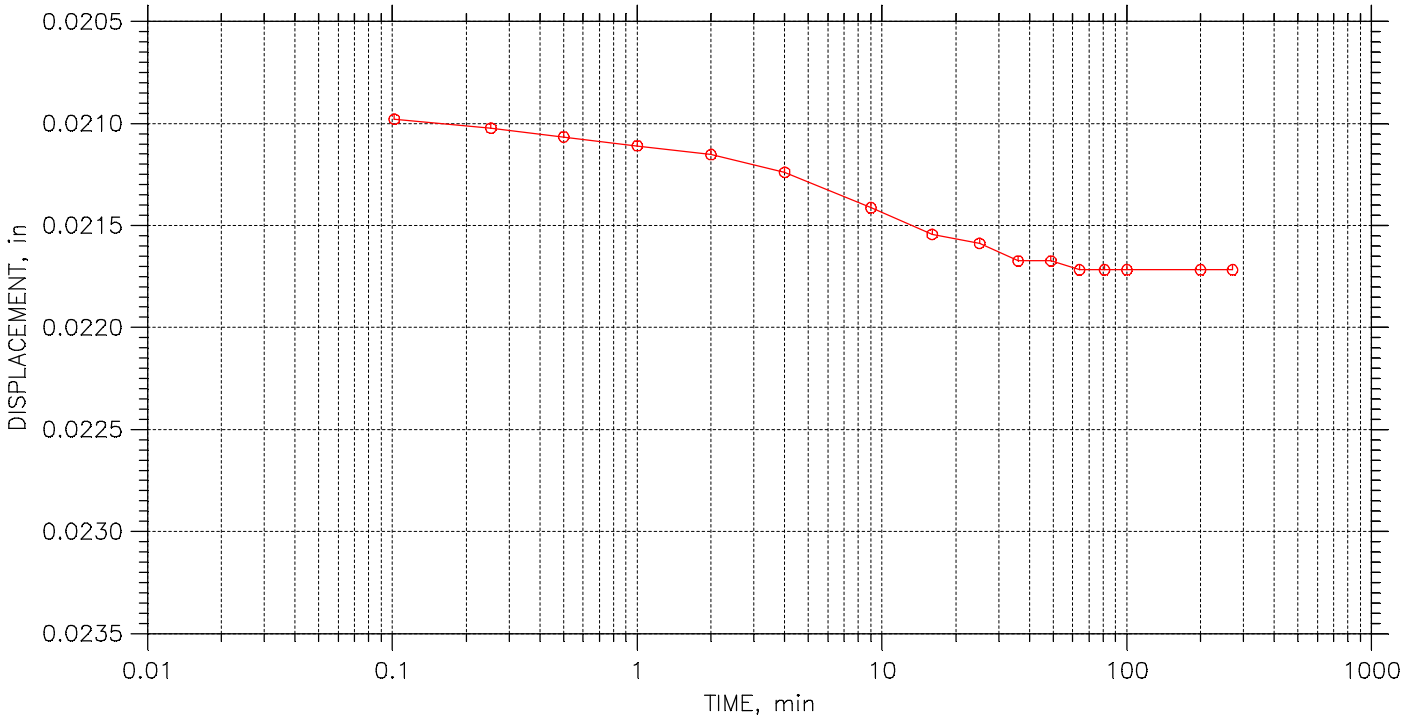
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

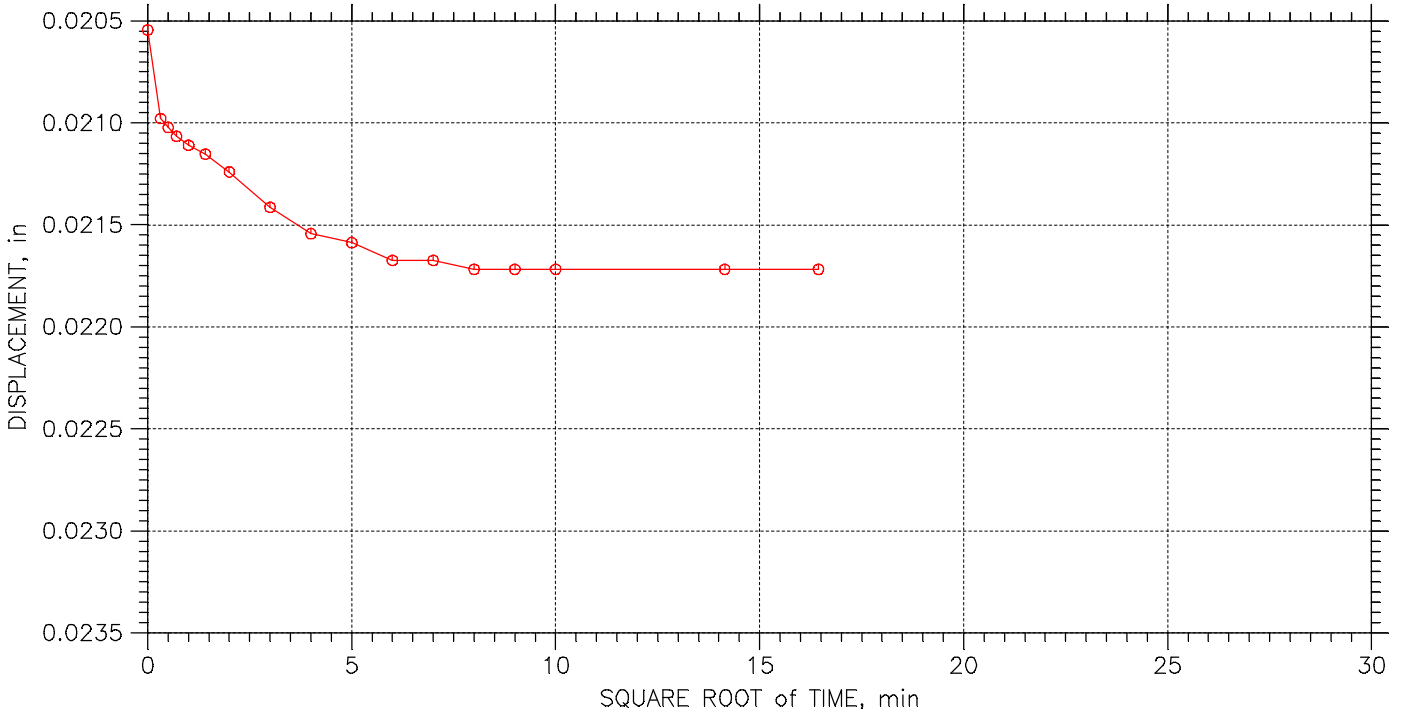
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 12 of 23

Stress: 0.75 tsf





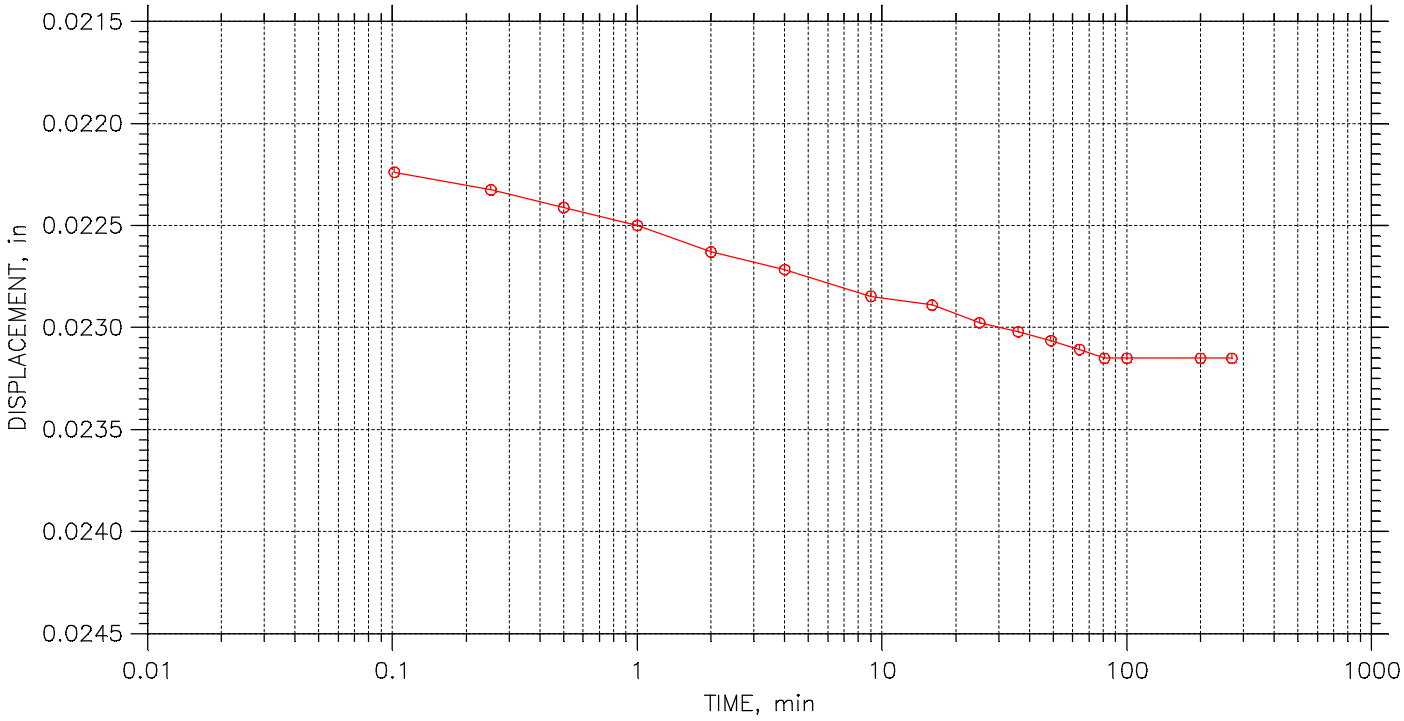
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

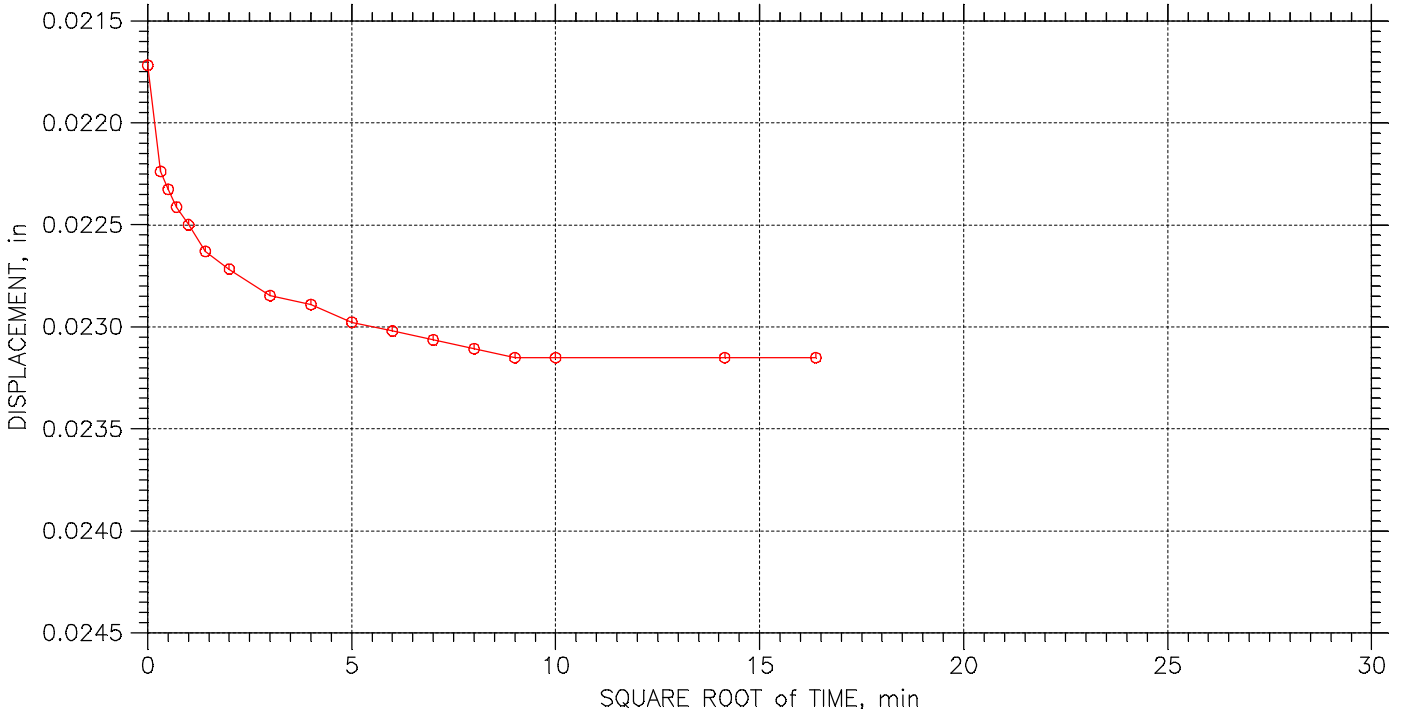
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 13 of 23

Stress: 1. tsf





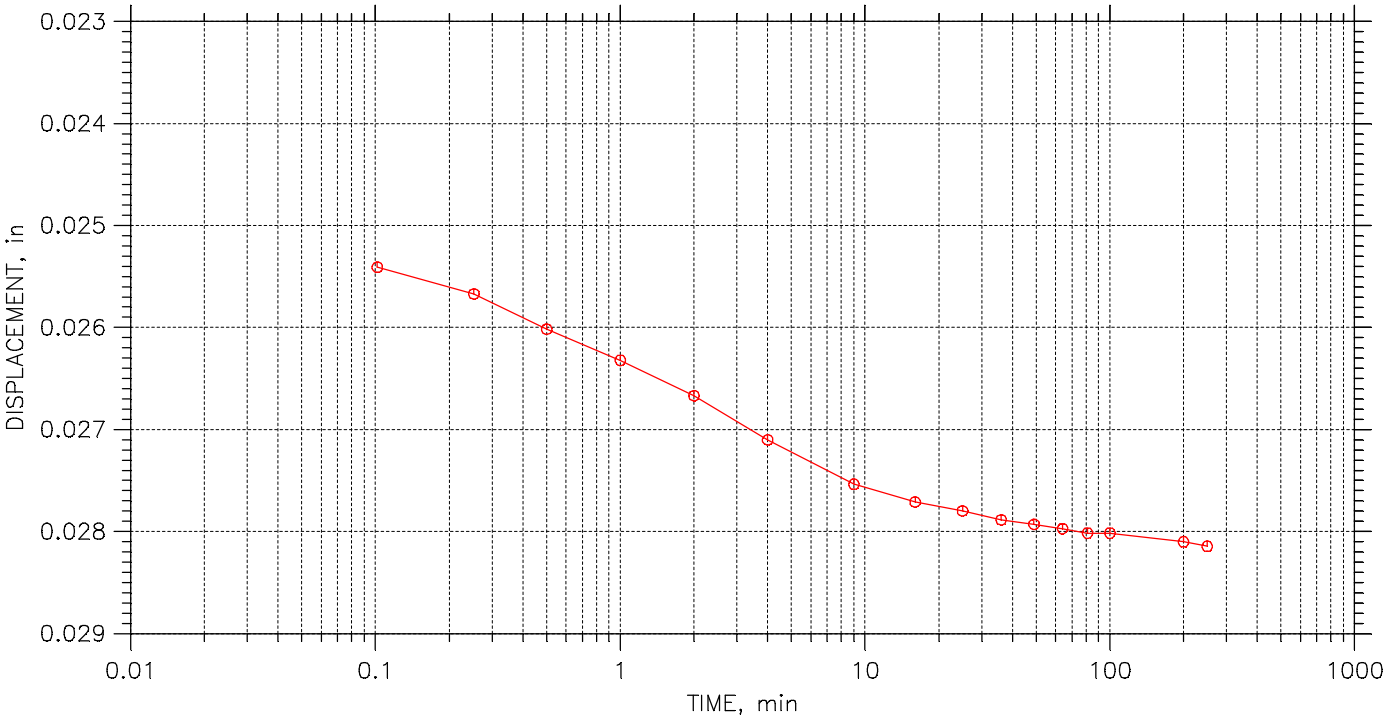
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

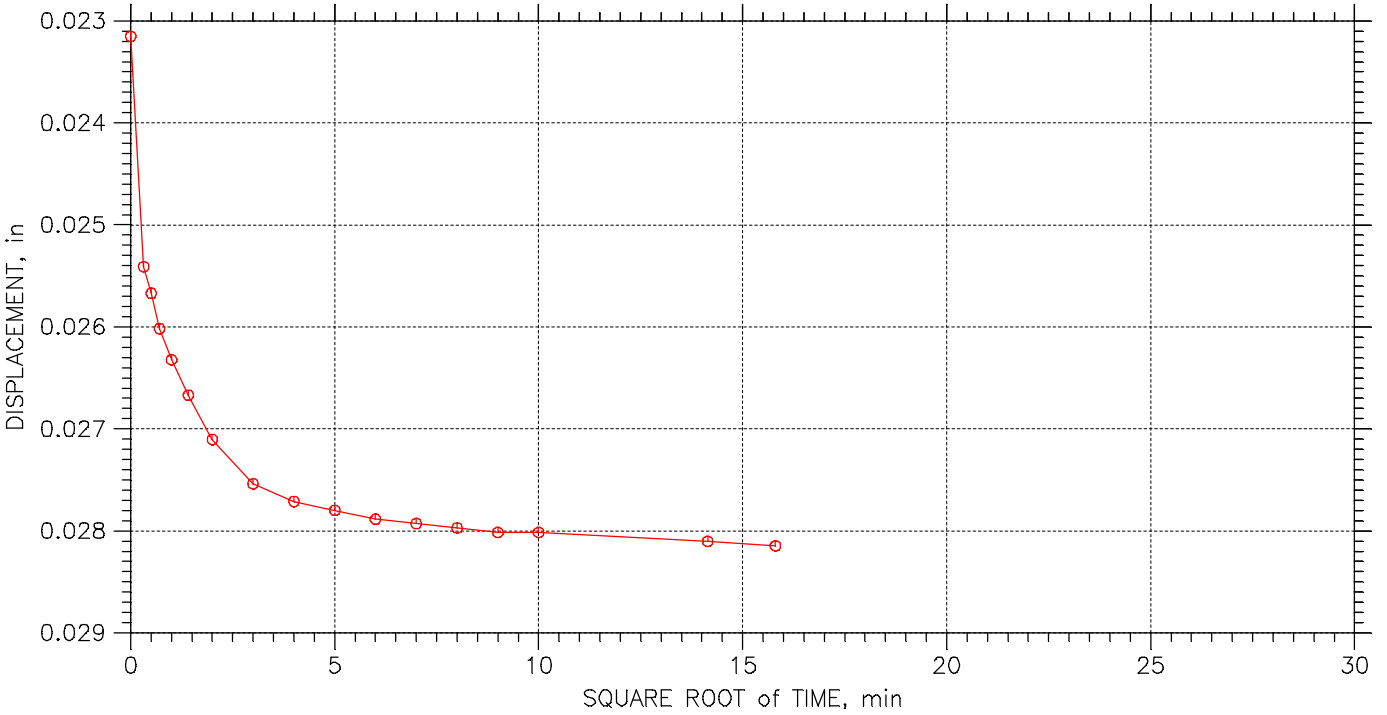
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 14 of 23

Stress: 2. tsf





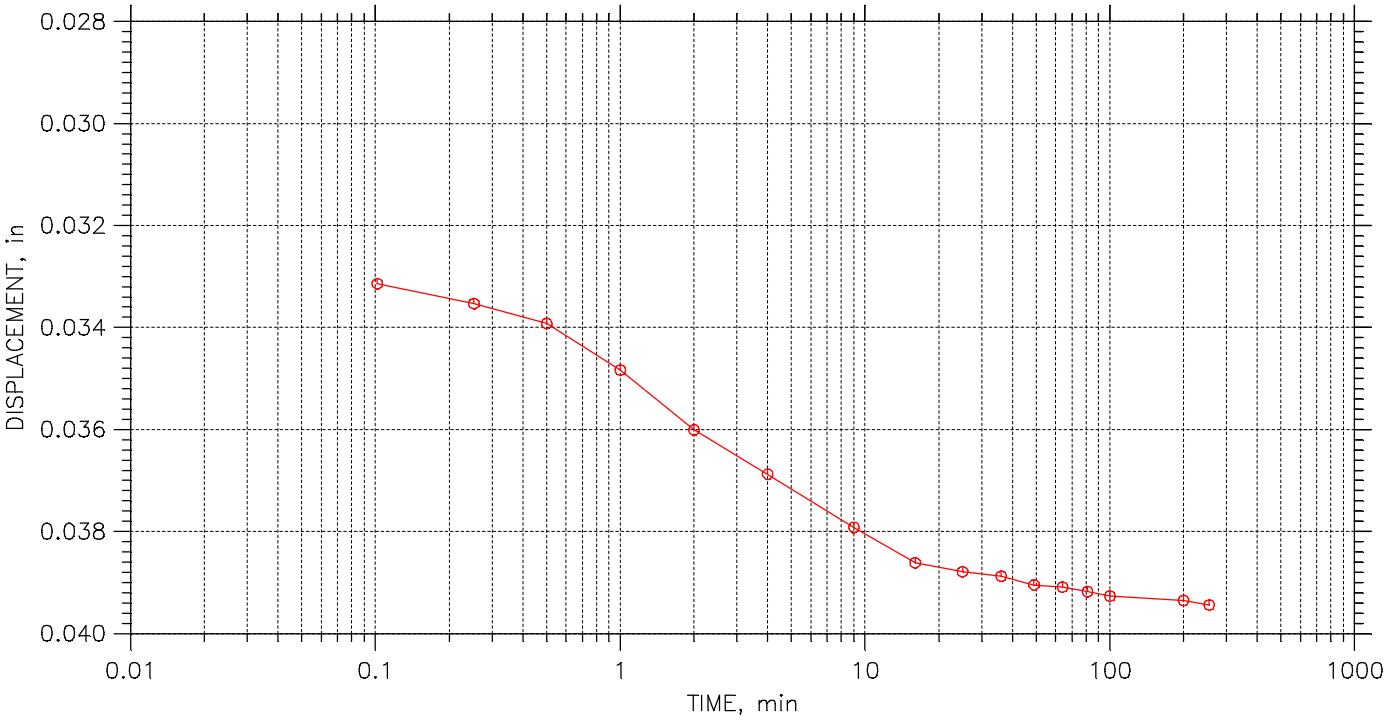
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

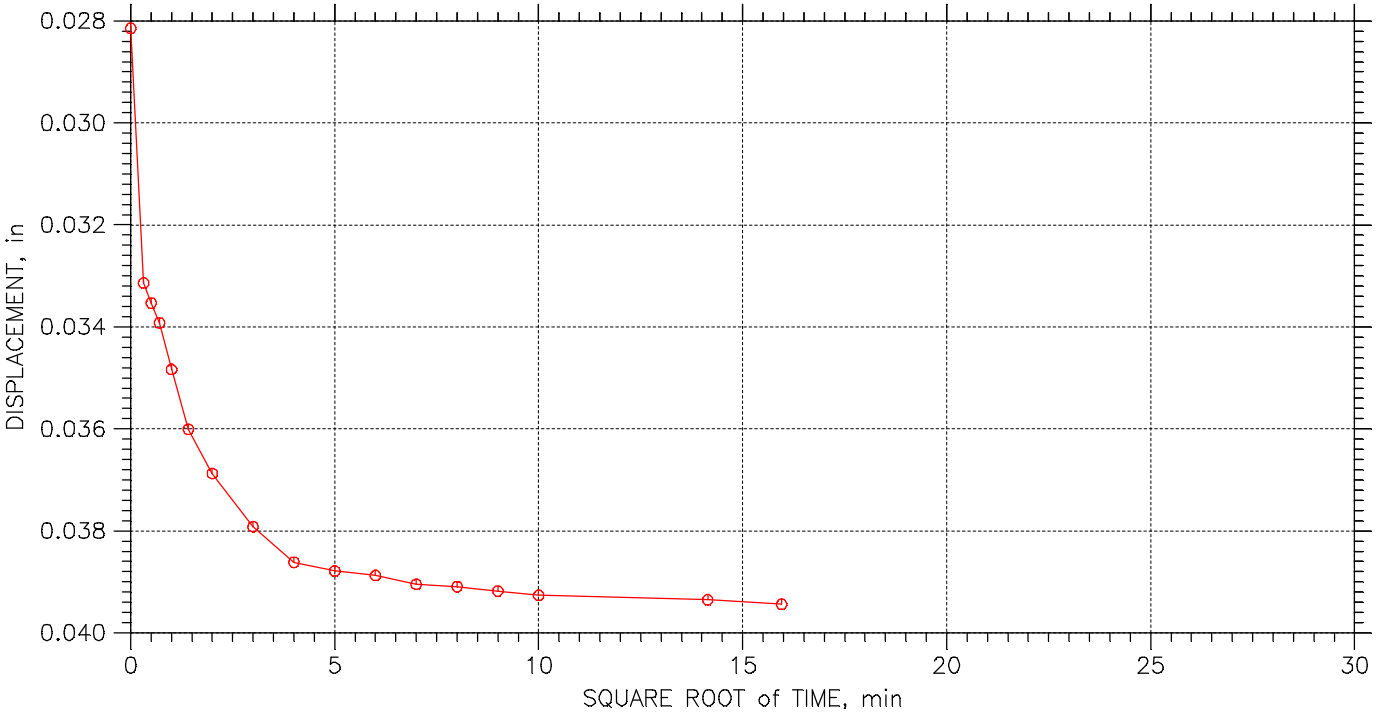
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 15 of 23

Stress: 4. tsf





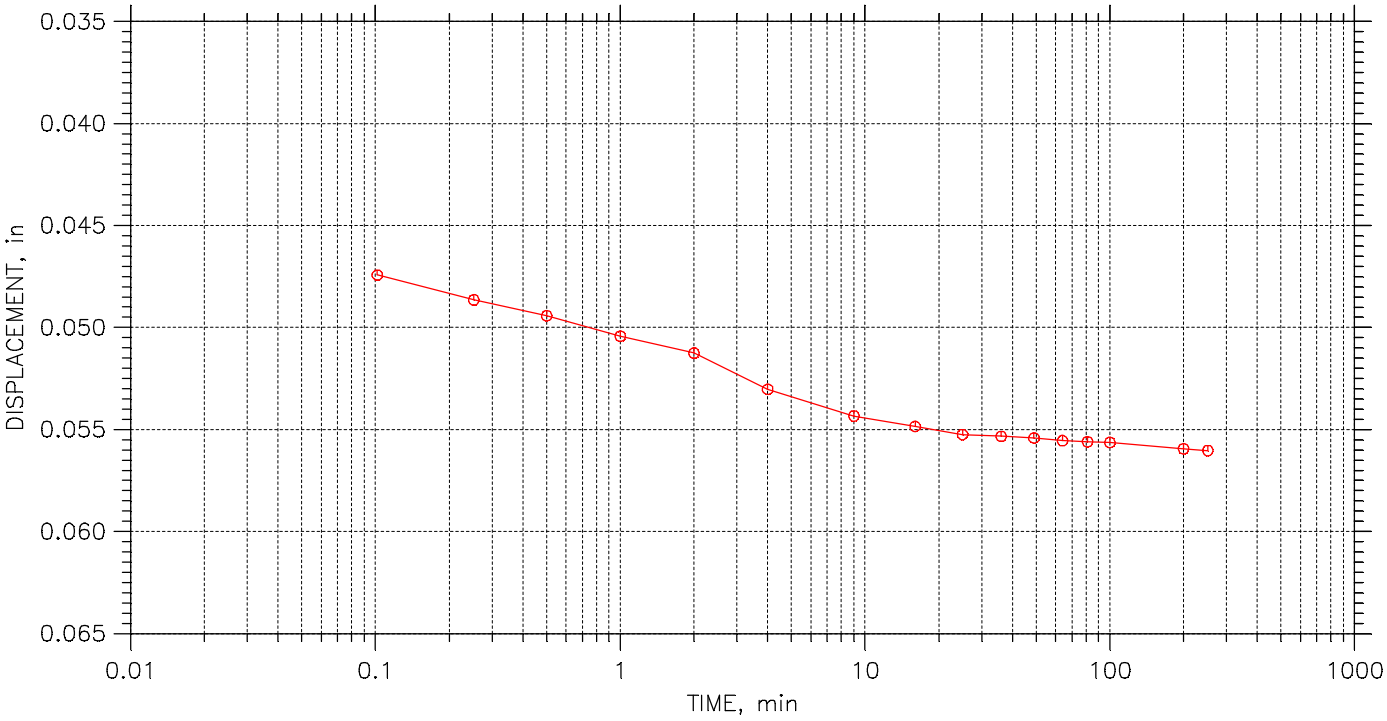
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

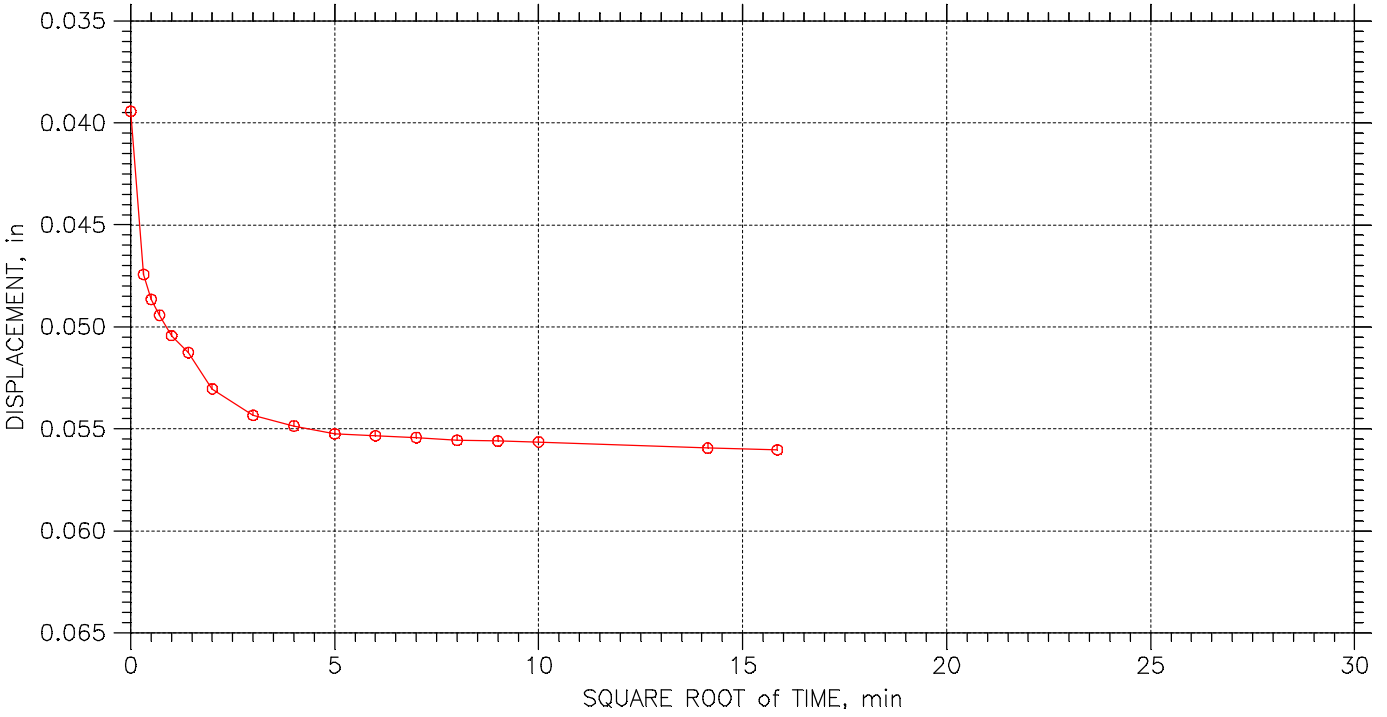
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 16 of 23

Stress: 8. tsf





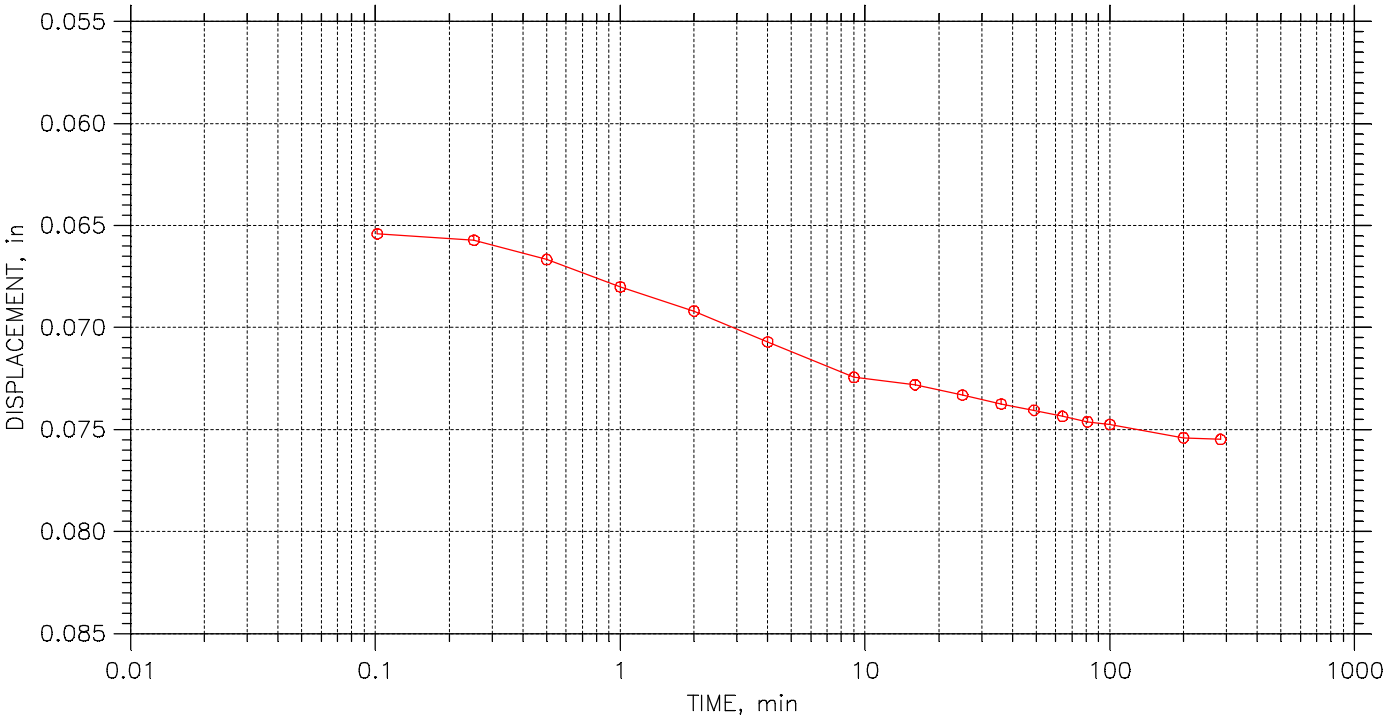
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

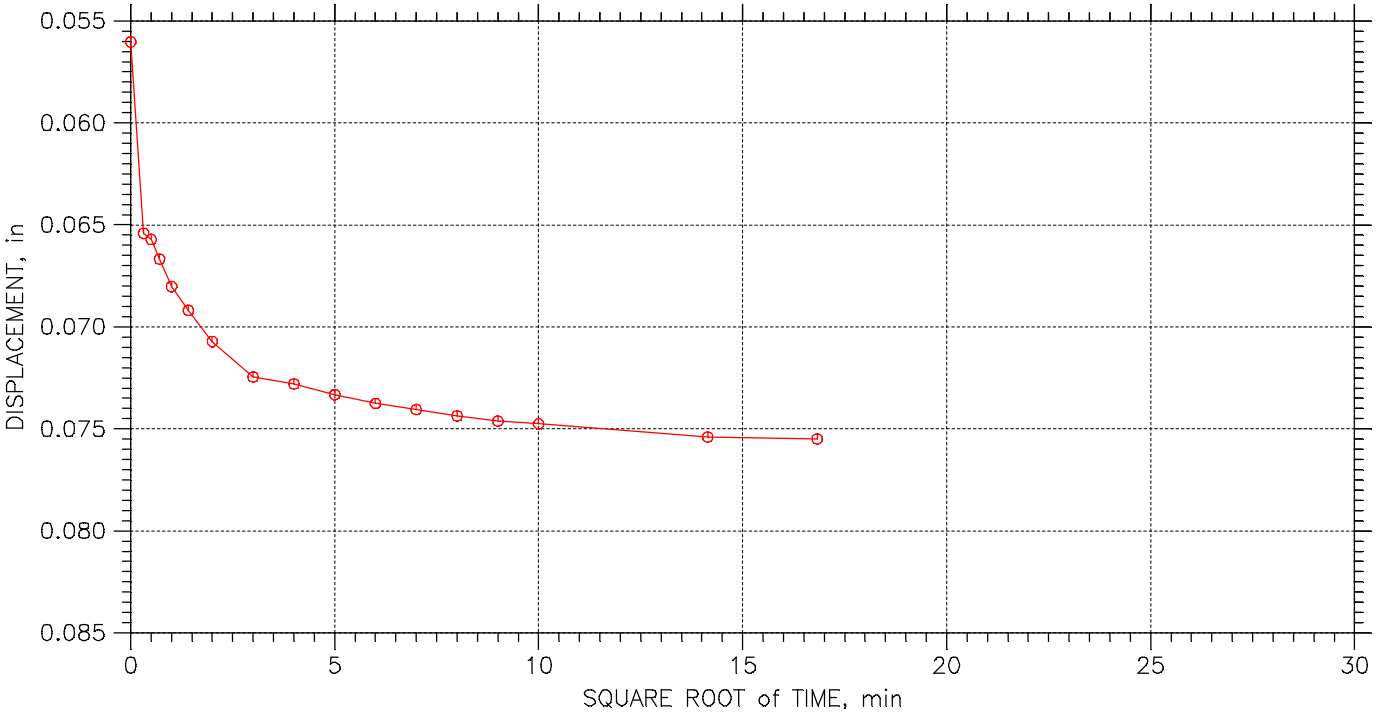
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 17 of 23

Stress: 16. tsf





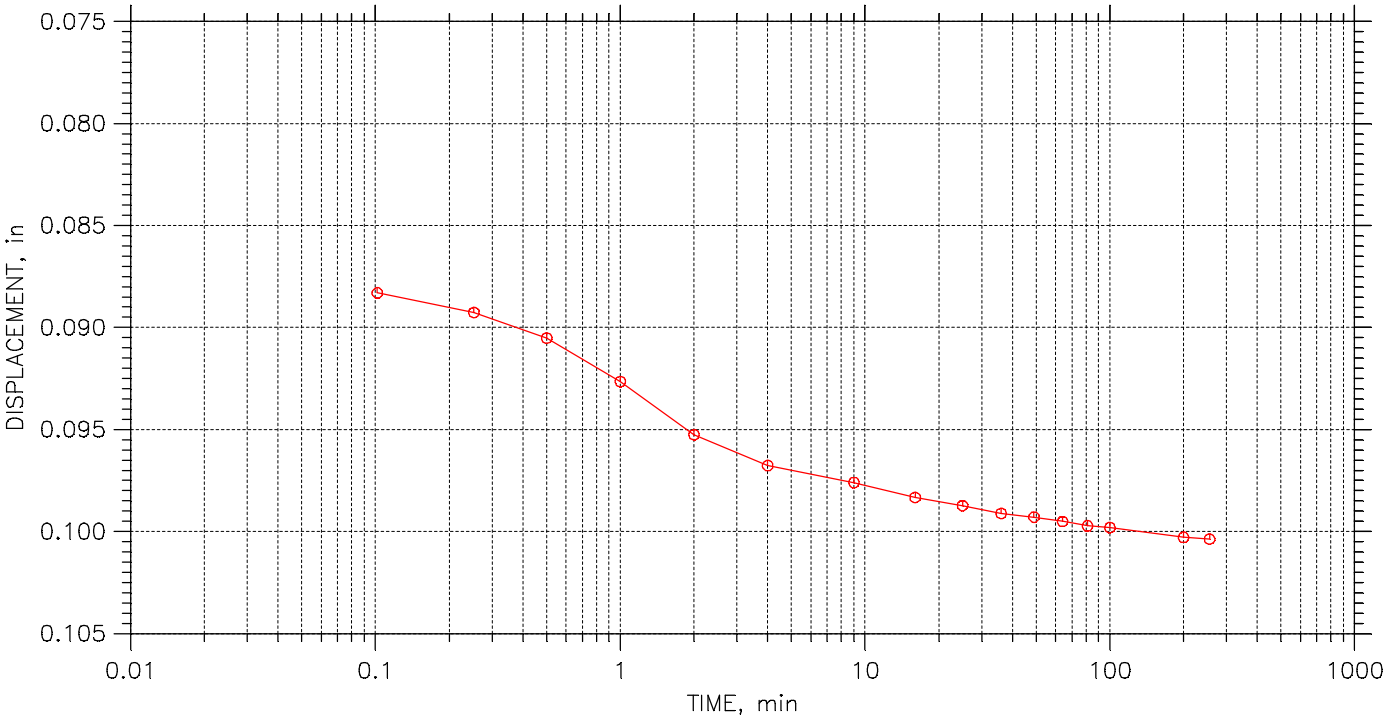
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

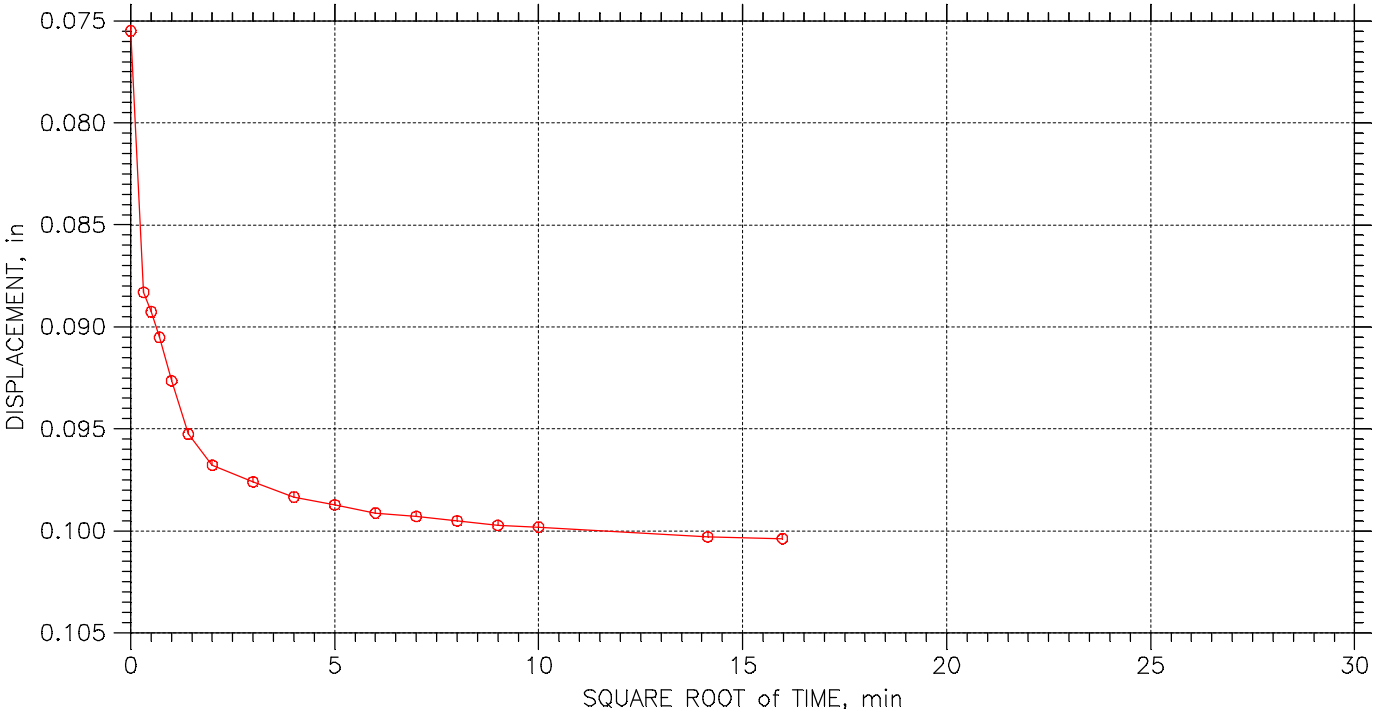
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 18 of 23

Stress: 32. tsf





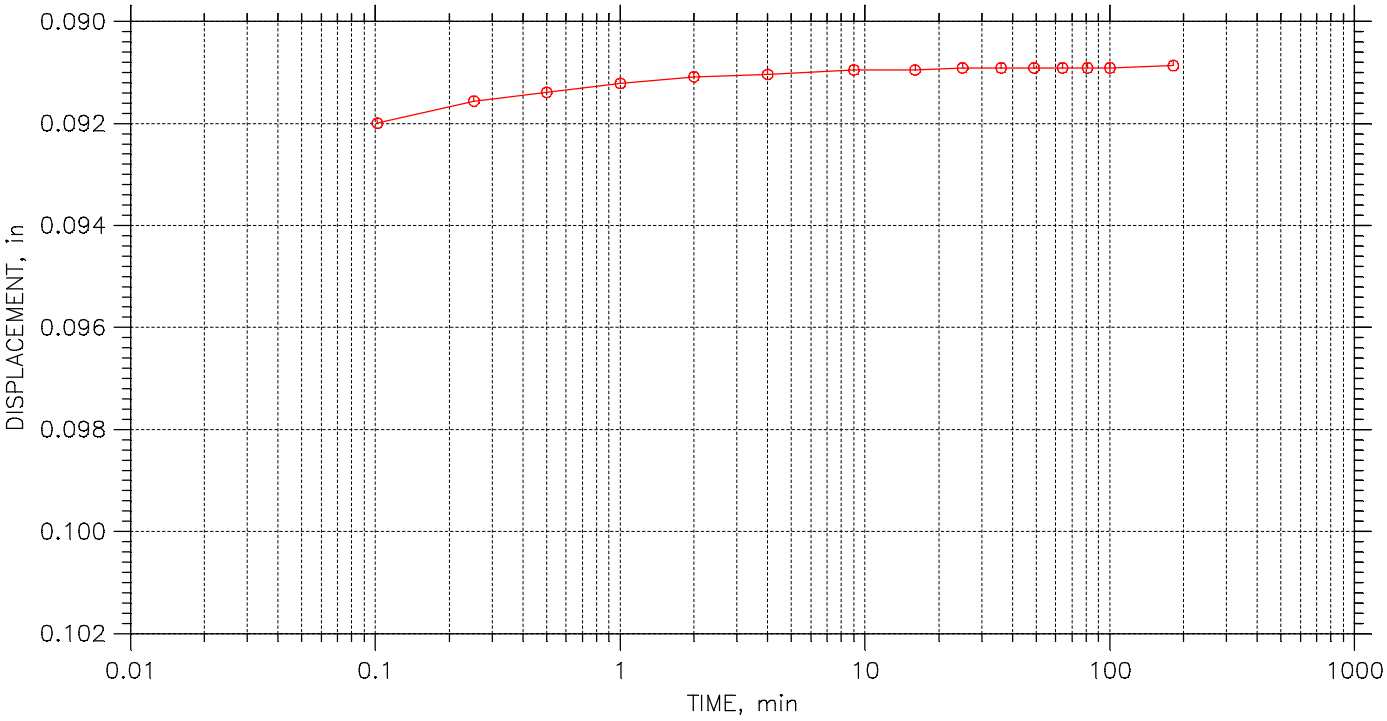
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

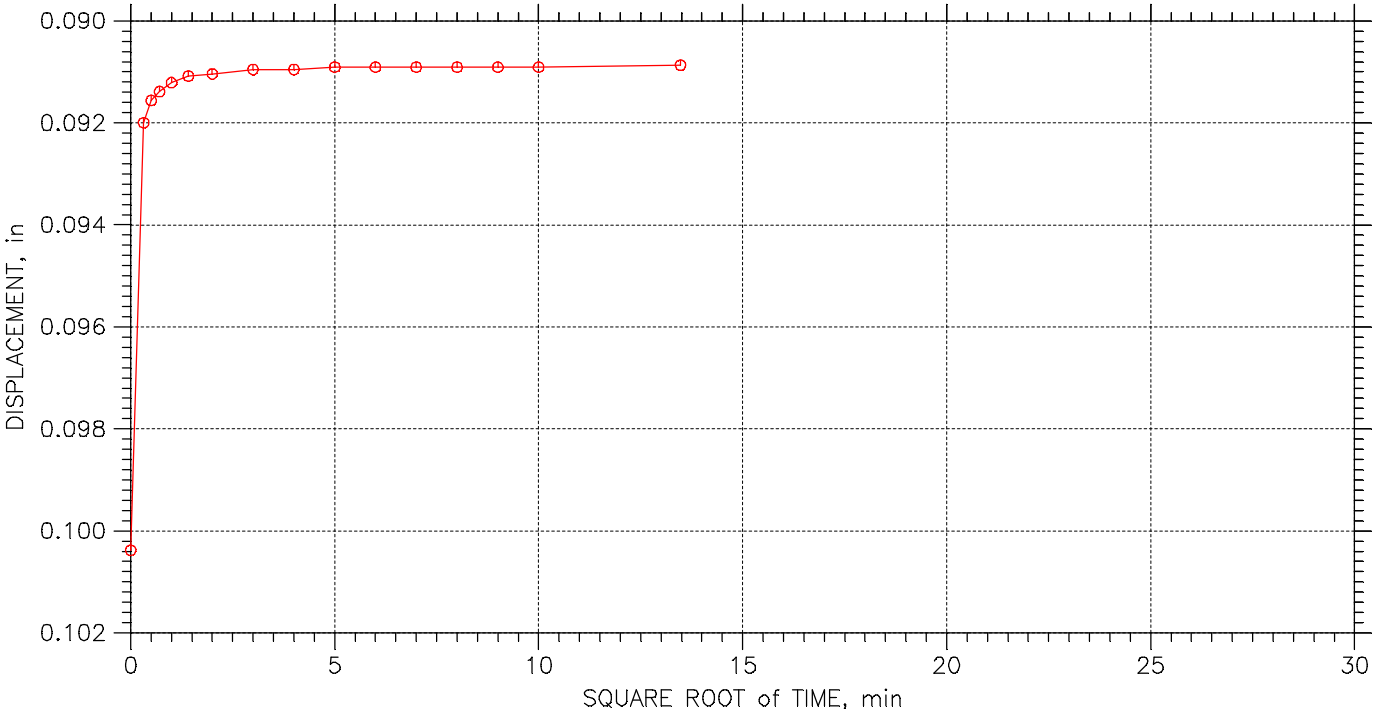
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 19 of 23

Stress: 16. tsf





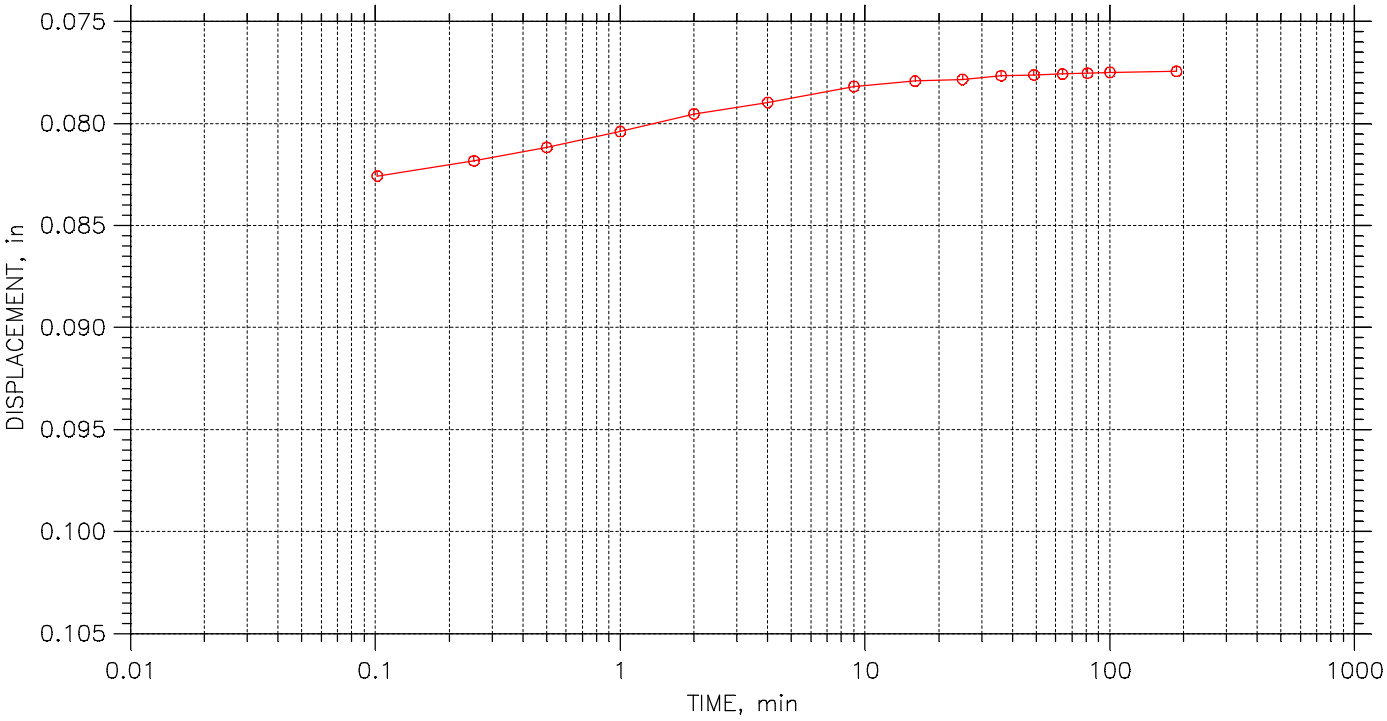
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

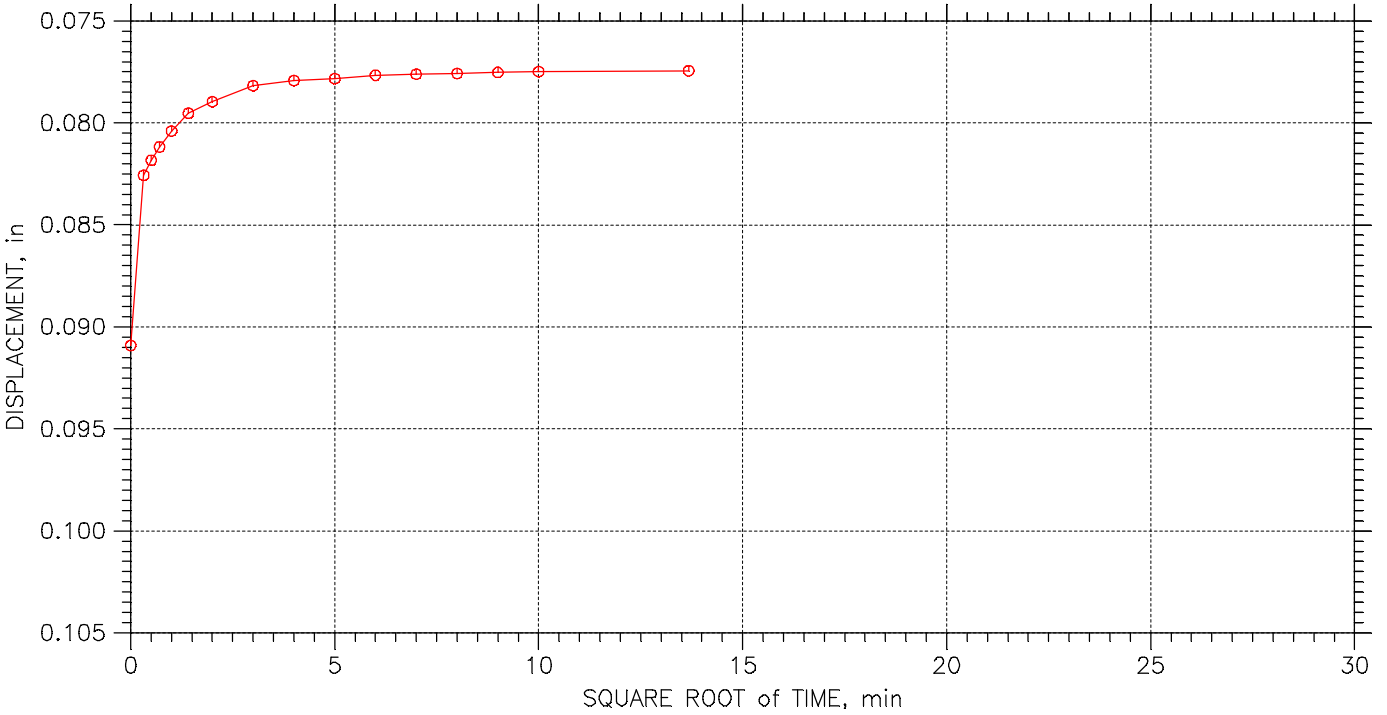
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 20 of 23

Stress: 4. tsf





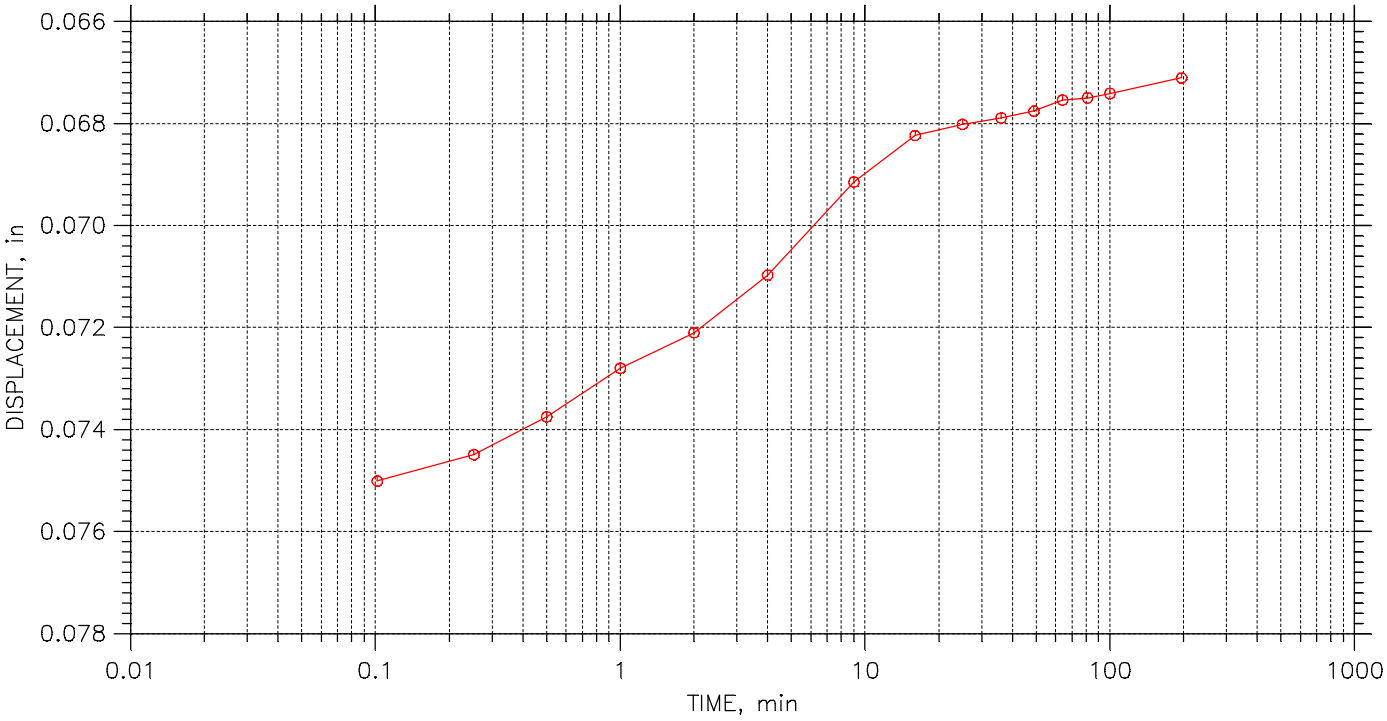
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

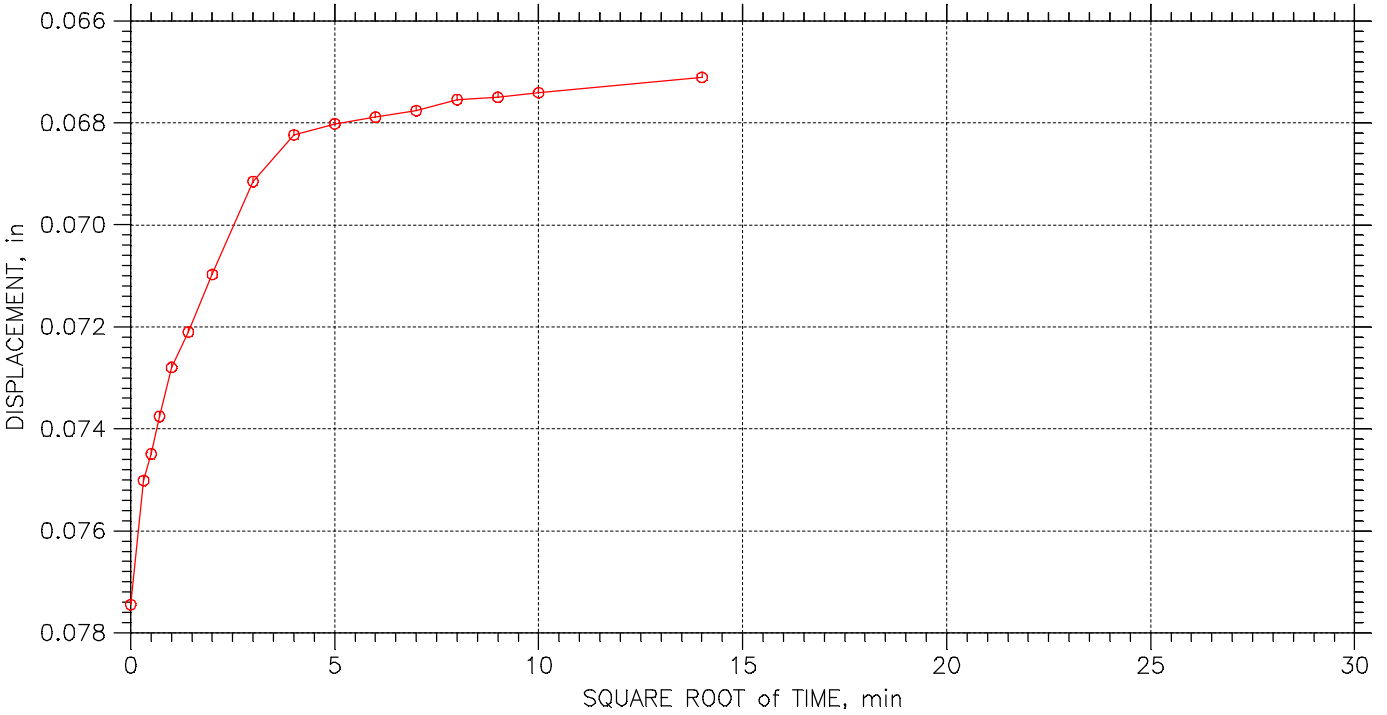
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 21 of 23

Stress: 1. tsf





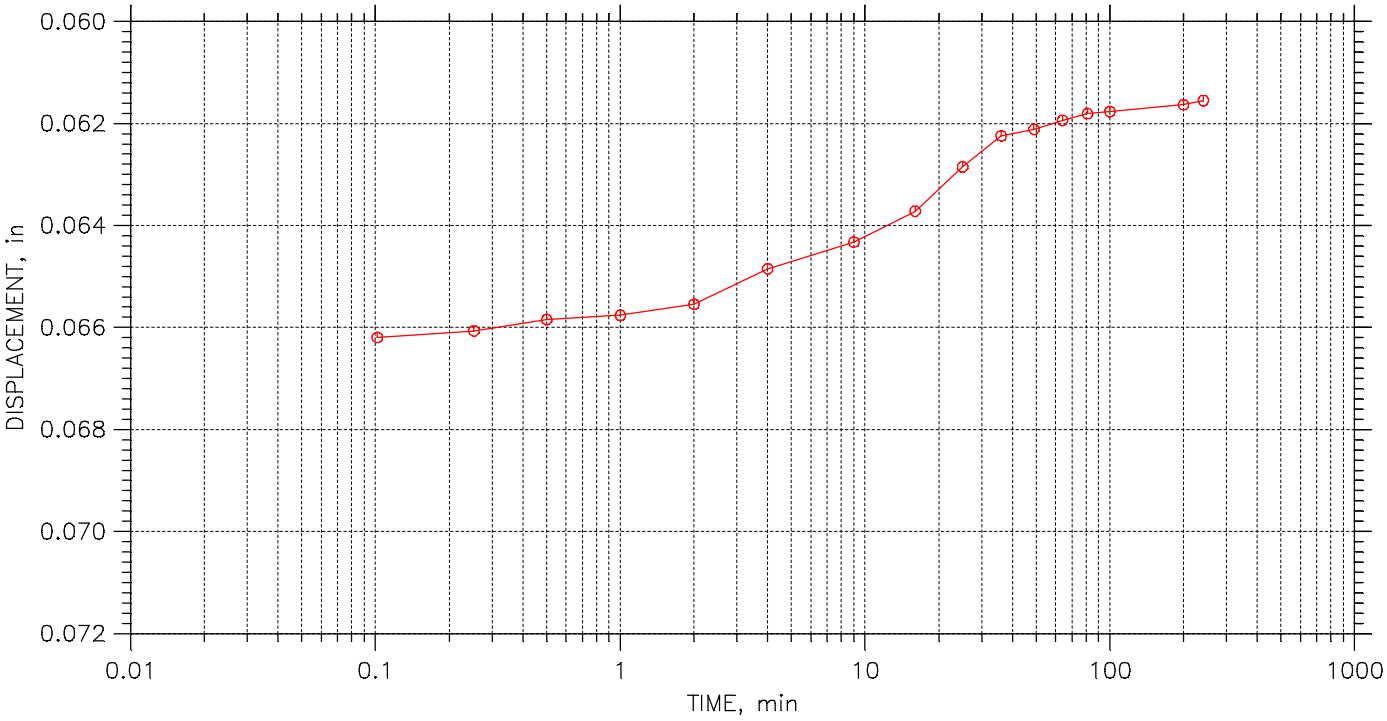
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

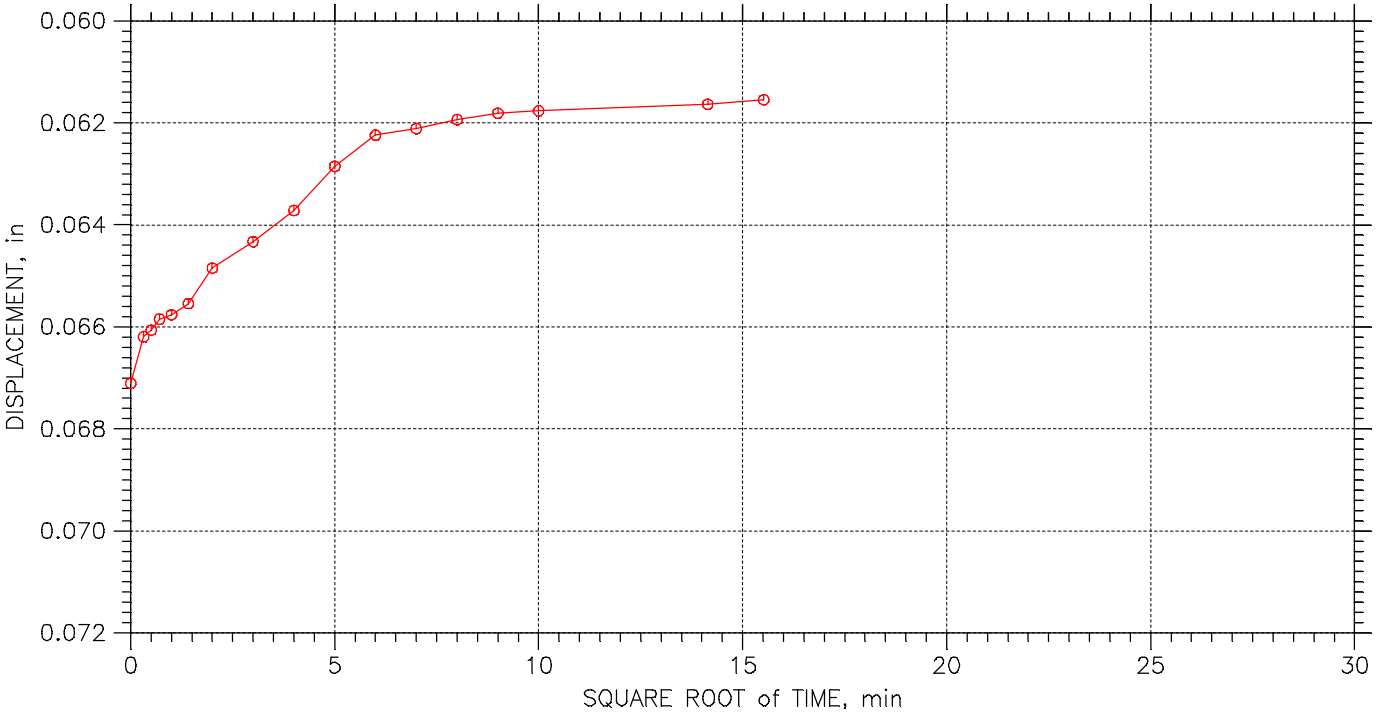
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 22 of 23

Stress: 0.5 tsf





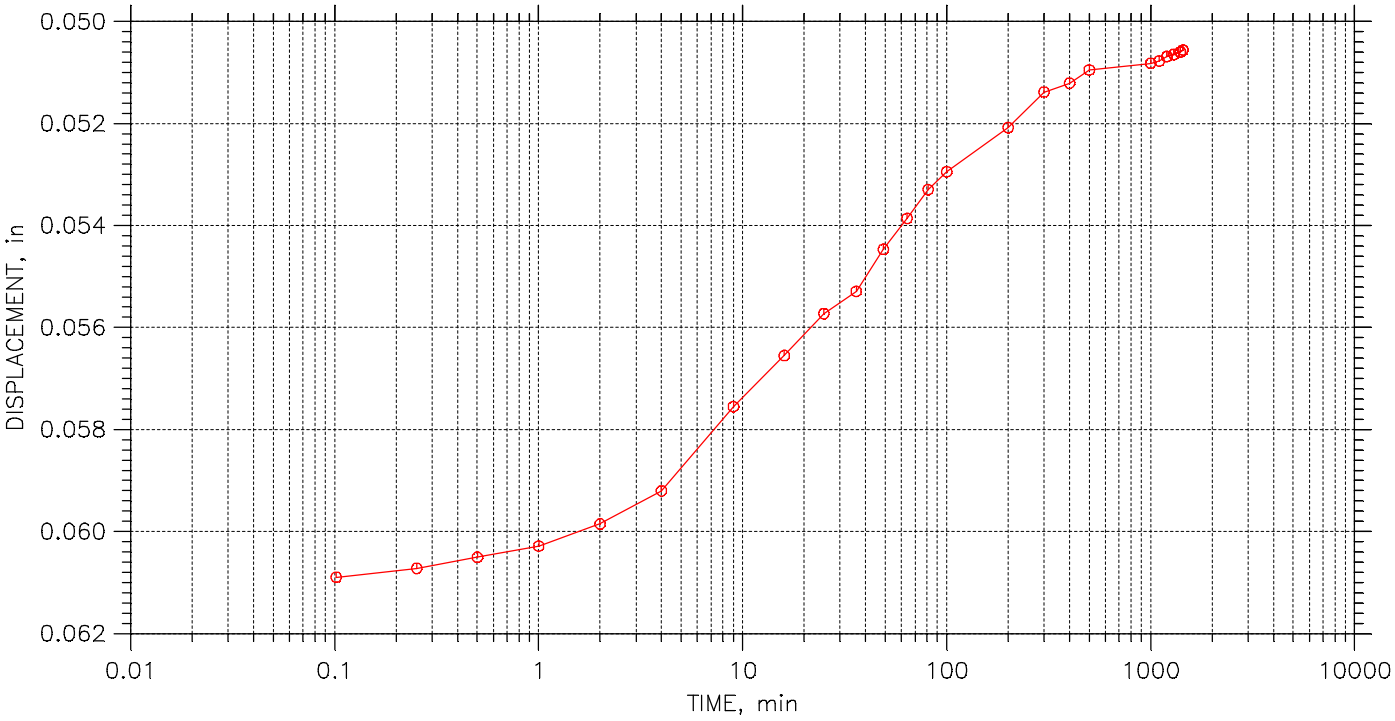
Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

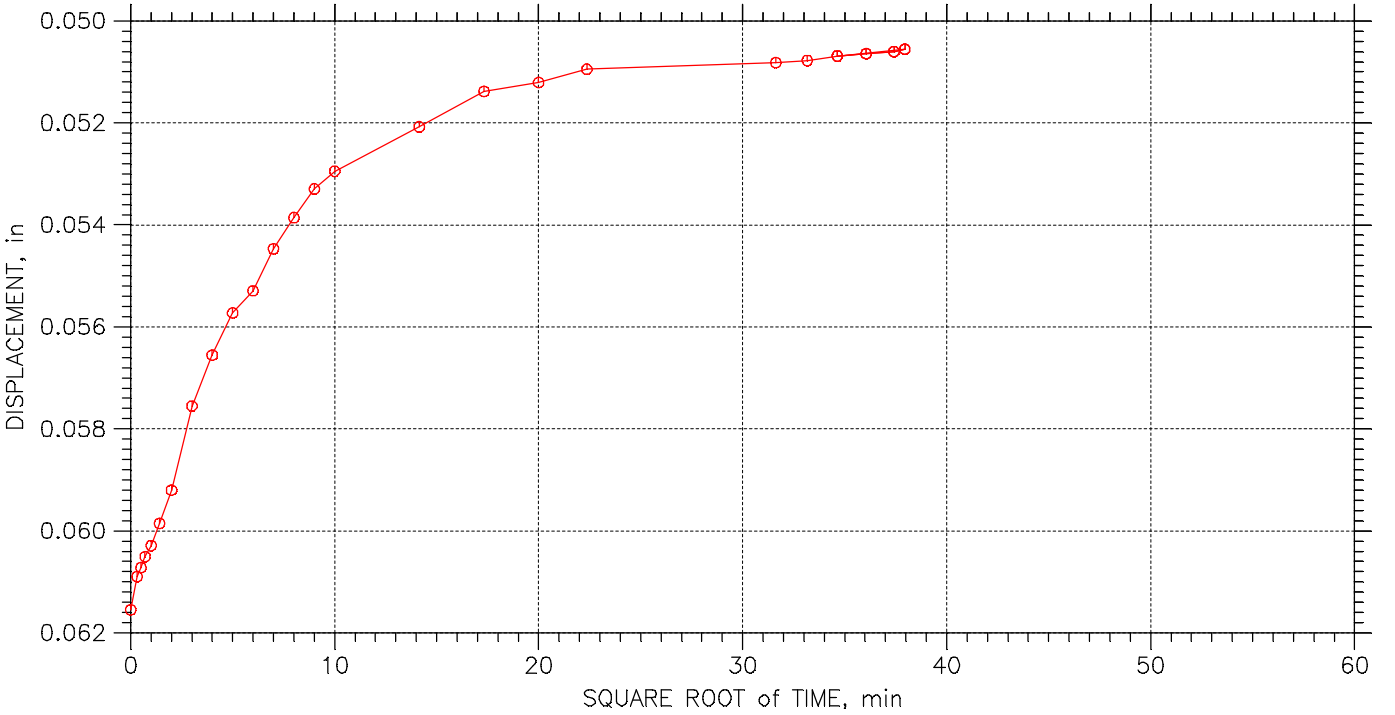
CONSOLIDATION TEST DATA

TIME CURVES

Constant Load Step: 23 of 23

Stress: 0.125 tsf





Terracon Consulting Engineers & Scientists	Project: GREEN ERA BIOTECH PT	Location: CHICAGO, IL	Project No.: MR175403
	Boring No.: B-1 18-20	Tested By: BCM	Checked By: WPQ
	Sample No.: S-7	Test Date: 11/30/17	Depth: 18.0'-20.0'
	Test No.: B11820CON	Sample Type: 3.0" ST	Elevation: ----
	Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED		
	Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435		

CONSOLIDATION TEST DATA

Terracon
Consulting Engineers & Scientists

Project: GREEN ERA BIOTECH PT
Boring No.: B-1 18-20
Sample No.: S-7
Test No.: B11820CON

Location: CHICAGO, IL
Tested By: BCM
Test Date: 11/30/17
Sample Type: 3.0" ST

Project No.: MR175403
Checked By: WPQ
Depth: 18.0'-20.0'
Elevation: ----

Soil Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED
Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435

Estimated Specific Gravity: 2.72
Initial Void Ratio: 0.47
Final Void Ratio: 0.38

Liquid Limit: 27
Plastic Limit: 15
Plasticity Index: 12

Initial Height: 0.75 in
Specimen Diameter: 2.50 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	X-3	RING	RING	X-5
Wt. Container + Wet Soil, gm	165.46	206.24	204.5	171.81
Wt. Container + Dry Soil, gm	148.89	189.1	189.1	156.37
Wt. Container, gm	42.66	77.21	77.21	44.22
Wt. Dry Soil, gm	106.23	111.89	111.89	112.15
Water Content, %	15.60	15.32	13.76	13.76
Void Ratio	---	0.47	0.38	---
Degree of Saturation, %	---	87.73	99.62	---
Dry Unit Weight, pcf	---	115.13	123.42	---

CONSOLIDATION TEST DATA

Terracon
Consulting Engineers & Scientists

Project: GREEN ERA BIOTECH PT
Boring No.: B-1 18-20
Sample No.: S-7
Test No.: B11820CON

Location: CHICAGO, IL
Tested By: BCM
Test Date: 11/30/17
Sample Type: 3.0" ST

Project No.: MR175403
Checked By: WPQ
Depth: 18.0'-20.0'
Elevation: ----

Soil Description: DARK GRAY LEAN CLAY WITH SAND TRACE GRAVEL CL 1.5" GRAVEL NOTED
Remarks: Pc = 2.1 tsf Cc = 0.110 Ccr = 0.010 TEST PERFORMED AS PER ASTM D2435

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. ft^2/sec	Coefficient of Consolidation Log ft^2/sec	Coefficient of Consolidation Ave. ft^2/sec
1	0.125	0.003258	0.469	0.43	0.0	0.0	1.35e-004	0.00e+000	1.35e-004
2	0.25	0.005299	0.465	0.70	3.8	0.7	8.31e-007	4.90e-006	1.42e-006
3	0.5	0.009903	0.456	1.32	0.2	0.0	1.31e-005	0.00e+000	1.31e-005
4	0.75	0.01351	0.448	1.80	1.9	0.6	1.66e-006	4.97e-006	2.49e-006
5	1	0.01729	0.441	2.30	11.4	0.0	2.71e-007	0.00e+000	2.71e-007
6	2	0.02719	0.422	3.61	0.9	0.0	3.21e-006	0.00e+000	3.21e-006
7	1	0.02402	0.428	3.19	0.2	0.0	1.29e-005	0.00e+000	1.29e-005
8	0.5	0.02202	0.432	2.93	2.8	1.3	1.08e-006	2.39e-006	1.49e-006
9	0.125	0.01724	0.441	2.29	2.1	0.0	1.46e-006	0.00e+000	1.46e-006
10	0.25	0.0182	0.439	2.42	23.3	0.0	1.32e-007	0.00e+000	1.32e-007
11	0.5	0.02063	0.434	2.74	2.1	0.0	1.46e-006	0.00e+000	1.46e-006
12	0.75	0.02172	0.432	2.89	3.7	0.0	8.27e-007	0.00e+000	8.27e-007
13	1	0.02315	0.430	3.08	2.1	0.0	1.45e-006	0.00e+000	1.45e-006
14	2	0.02815	0.420	3.74	0.9	0.0	3.23e-006	0.00e+000	3.23e-006
15	4	0.03944	0.398	5.24	2.1	0.4	1.40e-006	7.81e-006	2.38e-006
16	8	0.05603	0.365	7.45	0.7	0.0	3.99e-006	0.00e+000	3.99e-006
17	16	0.07549	0.327	10.03	1.0	0.0	2.81e-006	0.00e+000	2.81e-006
18	32	0.1004	0.278	13.34	0.5	0.0	5.47e-006	0.00e+000	5.47e-006
19	16	0.09087	0.297	12.08	0.0	0.0	1.04e-004	0.00e+000	1.04e-004
20	4	0.07744	0.323	10.29	0.1	0.0	2.18e-005	0.00e+000	2.18e-005
21	1	0.06711	0.343	8.92	2.1	0.0	1.26e-006	0.00e+000	1.26e-006
22	0.5	0.06155	0.354	8.18	14.5	0.0	1.86e-007	0.00e+000	1.86e-007
23	0.125	0.05056	0.376	6.72	21.5	20.9	1.29e-007	1.32e-007	1.31e-007

SUPPORTING INFORMATION

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

Green Era Biotechnology Plant ■ Chicago, Illinois

12/9/2017 ■ Terracon Project No. MR175403

Terracon GeoReport

SAMPLING	WATER LEVEL	FIELD TESTS
Rock Core Shelby Tube Split Spoon	**Water Initially Encountered** **Water Level After a Specified Period of Time** **Water Level After a Specified Period of Time** Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	**N** Standard Penetration Test Resistance (Blows/Ft.) **(HP)** Hand Penetrometer **(T)** Torvane **(DCP)** Dynamic Cone Penetrometer **UC** Unconfined Compressive Strength **(PID)** Photo-Ionization Detector **(OVA)** Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no ctual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL		RELATIVE PROPORTIONS OF FINES	
Descriptive Term(s) of other constituents	Percent of Dry Weight	**Descriptive Term(s) of other constituents**	**Percent of Dry Weight**
Trace	<15	Trace	<5
With	15-29	With	5-12
Modifier	>30	Modifier	>12

GRAIN SIZE TERMINOLOGY		PLASTICITY DESCRIPTION	
Major Component of Sample	**Particle Size**	**Term**	**Plasticity Index**
Boulders	Over 12 in. (300 mm)	Non-plastic	0
Cobbles	12 in. to 3 in. (300mm to 75mm)	Low	1 - 10
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)	Medium	11 - 30
Sand	#4 to #200 sieve (4.75mm to 0.075mm	High	> 30
Silt or Clay	Passing #200 sieve (0.075mm)		

UNIFIED SOIL CLASSIFICATION SYSTEM

Green Era Biotechnology Plant ■ Chicago, Illinois

October 22, 2018 ■ Terracon Project No. MR175403R1

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu ≥ 4 and 1 ≤ Cc ≤ 3 [E]		GW	Well-graded gravel [F]
			Cu < 4 and/or 1 > Cc > 3 [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu ≥ 6 and 1 ≤ Cc ≤ 3 [E]		SW	Well-graded sand [I]
			Cu < 6 and/or 1 > Cc > 3 [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OL	Organic clay [K,L,M,N] / Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OH	Organic clay [K,L,M,P] / Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

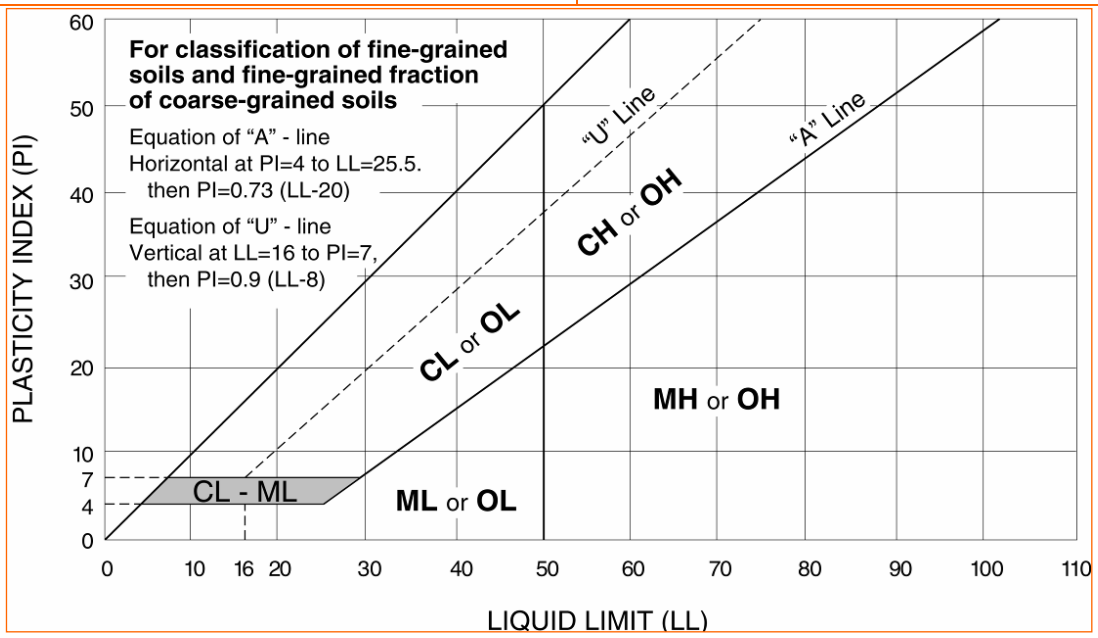
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



DESCRIPTION OF ROCK PROPERTIES

Green Era Biotechnology Plant ■ Chicago, Illinois

October 22, 2018 ■ Terracon Project No. MR175403R1

WEATHERING	
Term	**Description**
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Slightly Weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than in its fresh condition.
Moderately Weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Highly Weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Completely Weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.
Residual Soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

STRENGTH OR HARDNESS		
Description	**Field Identification**	**Uniaxial Compressive Strength, psi (MPa)**
Extremely Weak	Indented by thumbnail	40-150 (0.3-1)
Very Weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	150-700 (1-5)
Weak Rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	700-4,000 (5-30)
Medium Strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	4,000-7,000 (30-50)
Strong Rock	Specimen requires more than one blow of geological hammer to fracture it	7,000-15,000 (50-100)
Very Strong	Specimen requires many blows of geological hammer to fracture it	15,000-36,000 (100-250)
Extremely Strong	Specimen can only be chipped with geological hammer	>36,000 (>250)

DISCONTINUITY DESCRIPTION			
Fracture Spacing (Joints, Faults, Other Fractures)		**Bedding Spacing (May Include Foliation or Banding)**	
Description	**Spacing**	**Description**	**Spacing**
Extremely Close	< ¾ in (<19 mm)	**Laminated**	< ½ in (<12 mm)
Very Close	¾ in – 2-1/2 in (19 - 60 mm)	**Very thin**	½ in – 2 in (12 – 50 mm)
Close	2-1/2 in – 8 in (60 – 200 mm)	**Thin**	2 in – 1 ft. (50 – 300 mm)
Moderate	8 in – 2 ft. (200 – 600 mm)	**Medium**	1 ft. – 3 ft. (300 – 900 mm)
Wide	2 ft. – 6 ft. (600 mm – 2.0 m)	**Thick**	3 ft. – 10 ft. (900 mm – 3 m)
Very Wide	6 ft. – 20 ft. (2.0 – 6 m)	**Massive**	> 10 ft. (3 m)

Discontinuity Orientation (Angle): Measure the angle of discontinuity relative to a plane perpendicular to the longitudinal axis of the core. (For most cases, the core axis is vertical; therefore, the plane perpendicular to the core axis is horizontal.) For example, a horizontal bedding plane would have a 0-degree angle.

ROCK QUALITY DESIGNATION (RQD) [1]	
Description	**RQD Value (%)**
Very Poor	0 - 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 - 100

1. The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

Reference: U.S. Department of Transportation, Federal Highway Administration, Publication No FHWA-NHI-10-034, December 2009
Technical Manual for Design and Construction of Road Tunnels – Civil Elements

ATTACHMENT 8
GEOTECHNICAL DATA REPORT (JANUARY 6, 2023)

Green Era Biotechnology Plant

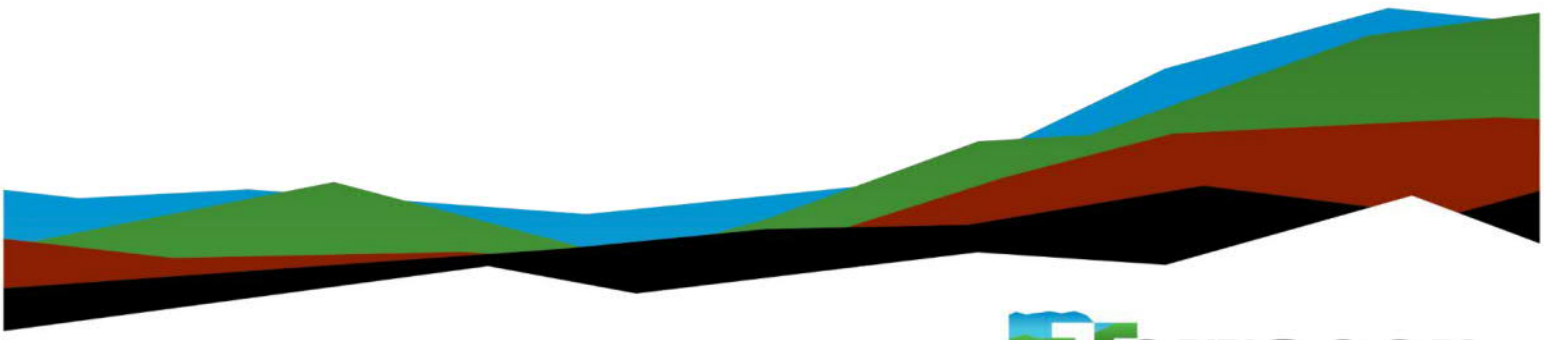
Geotechnical Data Report

January 6, 2023 | Terracon Project No. A2207015

Rev 1

Prepared for:

Green Era Educational NFP
218 North Jefferson Street, Suite 300
Chicago, IL 60661



Terracon
Explore with us

Nationwide
Terracon.com

- Facilities
- Environmental
- Geotechnical
- Materials

Wang Engineering
A Terracon Company

1145 N Main St.
Lombard, IL 60148
P (630) 953-9928
Terracon.com

January 6, 2023

Green Era Educational NFP
218 North Jefferson Street, Suite 300
Chicago, IL 60661

Attn: Mr. Jason Feldman

Re: Geotechnical Data Report
Green Era Biotechnology Plant
650 West 83rd Street
Chicago, IL
Terracon Project No. A2207015 Rev 1

Dear Mr. Feldman

We have completed the scope of Geotechnical Data services for the above referenced project in general accordance with Terracon's Supplemental to Agreement for Services authorized September 6, 2022, 2022. This report presents the findings of the subsurface exploration for the proposed project. It is understood that geotechnical recommendations were not requested as part of our scope of work.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon

Ravi Gorlagunta
Project Engineer

Paul J. Koszarek, P.E.
Principal

PAUL J. KOSZAREK
062-058563
LICENSED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

Table of Contents

Attachments

Introduction

This report presents the results of our subsurface exploration performed for the proposed Green Era Biotechnology Plant located at 650 West 83rd Street in Chicago, IL.

The geotechnical engineering Scope of Services for this project included blind drilling five borings and insertion of temporary monitoring wells denoted as MW-101 through MW-105, groundwater well elevation monitoring and surveying, as well as the advancement of one test boring (denoted as B-1) and conversion to permanent monitoring well (denoted as MW B-1), laboratory testing, in-situ hydraulic testing, engineering analysis, and preparation of this report. Boring B-1 was placed downgradient of the building as determined by the direction of groundwater flow per client request.

Drawings showing the site and boring locations are shown on the **Site Location** and **Exploration Plan**, respectively. In addition, the presentation of the groundwater well elevation monitoring data and in-situ hydraulic testing procedures and results are also included in the **Exploration and Laboratory Results**. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs and/or as separate graphs in the **Exploration Results** section.

Geotechnical Characterization

We have a completed one soil boring B-1 to a depth of 16 feet for geotechnical characterization. The boring was sampled continuously. Upon completion of the boring, a monitoring well denoted as MW B-1 was constructed in the boring. The data for the monitoring well is presented in the appendix of this report.

The soils observed at the boring location consisted of 7 inches of topsoil underlain by fill soils consisting of lean clay followed by buried topsoil. The fill soils extended to a depth of about 7 feet. Below the fill soils, we observed native lean clay soils, gray to brownish gray until the termination depth of the boring. An unconfined compressive strength test was completed on a sample of the brownish gray clay yielding an unconfined compressive strength of 0.94 tsf, moisture content of 22.7% and a dry unit weight of 115 pcf.

Groundwater was observed during the drilling of the boring at depth of 10 feet. As indicated, a monitoring well was constructed at this boring and water level data within the well is reported in the appendix of this report.

Attachments

Exploration and Testing Procedures

Field Exploration

Terracon completed the following borings for this project:

Number of Boring	Planned Boring Depth (feet) [1]	Planned Location [2]
1	16	Downgradient from the building footprint
5 (blind drill Borings)	15	Along the perimeter of the site to determine groundwater flow direction (blind drilled)

1. The boring locations are shown on the attached **Anticipated Exploration Plan**.

Boring Layout and Elevations: We used a Trimble brand handheld GPS equipment to locate boring with an estimated horizontal accuracy of +/-3 feet. Field measurements from existing site features may be utilized. If available, approximate elevations obtained by interpolation from a site specific, surveyed topographic map, if provided.

Groundwater Level Measurements: Traditional surveying equipment was used to measure the relative elevation, to the nearest 1/100th of a foot, of the ground surface and top-of-casing (top of the well casing [TOC]) elevations for temporary monitoring wells MW-101 through MW-105 relative to a convenient site reference (nearby surveyed storm sewer manhole cover). The temporary wells were abandoned after the completion of the surveying activities. The depth to water level was measured by lowering an electric water tape into each well casing. The electric water tape broadcasted an audible signal upon reaching the water table. Once contact with the groundwater was established, the measurement on the tape at the reference point (top of the well casing) was recorded to the nearest 0.01 foot. Based on the groundwater elevation data from September 30, 2022, a groundwater contour map (Figure 2) was developed for the site and the groundwater flow beneath the site is generally towards the northeast. The temporary wells, MW-101 through MW-105 were abandoned after the completion of the surveying activities.

Subsurface Exploration Procedures: We advanced the boring with a truck-mounted drill rig using hollow stem augers. Samples were obtained continuously within boring MW-B1. Samples were not obtained for geotechnical analysis from MW-101 to MW-105. Soil sampling is typically performed using thin-wall tube and/or split-barrel sampling procedures. The split-barrel samplers are driven in accordance with the standard penetration test (SPT). The samples were placed in appropriate containers, taken to our

laboratory for testing, and classified by a project engineer. In addition, we observed and recorded groundwater levels during drilling and sampling.

Our field geologist prepared field boring logs as part of standard drilling operations including sampling depths, penetration distances, and other relevant sampling information. Field logs include visual classifications of materials observed during drilling and our interpretation of subsurface conditions between samples. Final boring logs, prepared from field logs, represent the project engineer's interpretation and included modifications based on observations and laboratory tests.

In-Situ Hydraulic Conductivity Testing

Terracon measured in-situ hydraulic conductivity at monitoring well MWB-1, a 2-inch diameter monitoring well installed in boring B-1, using a "bail-down" method. The general principle when conducting this type of test is to stress the water-bearing formation near the monitoring well by lowering the head pressure in the well. The recovery of the water level in the well following the induced stress was recorded using an electronic pressure transducer and an estimate of the hydraulic conductivity of the formation was calculated.

On October 13, 2022, water from monitoring well MWB-1 was removed using a disposable PVC bailer. Throughout the bail-down and recovery periods, the water level in the monitoring well was measured using a pressure transducer connected with direct-read cables to a laptop. Enough water was removed from the well to produce at least approximately 1 foot of drawdown. Terracon used the Bouwer-Rice[1] method implemented by AQTESOLV software to calculate the hydraulic conductivity of the formation. Based on the test performed at MWB-1, the hydraulic conductivity value estimated for the saturated soils at the site is approximately 8.57×10^{-5} cm/sec.

Laboratory Testing

The project engineer reviewed field data and assigned laboratory tests to understand the engineering properties of various soil strata. The following laboratory testing were performed:

- Water content

[1] Bouwer, H. and R.C. Rice, 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, vol. 12, no. 3, pp. 423-428.

- Grain size
- Unconfined compressive strength
- Direct shear

Our laboratory testing program often includes observation of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified soil samples in accordance with the Unified Soil Classification System (USCS).

Site Location and Exploration Plans

Contents:

Site Location

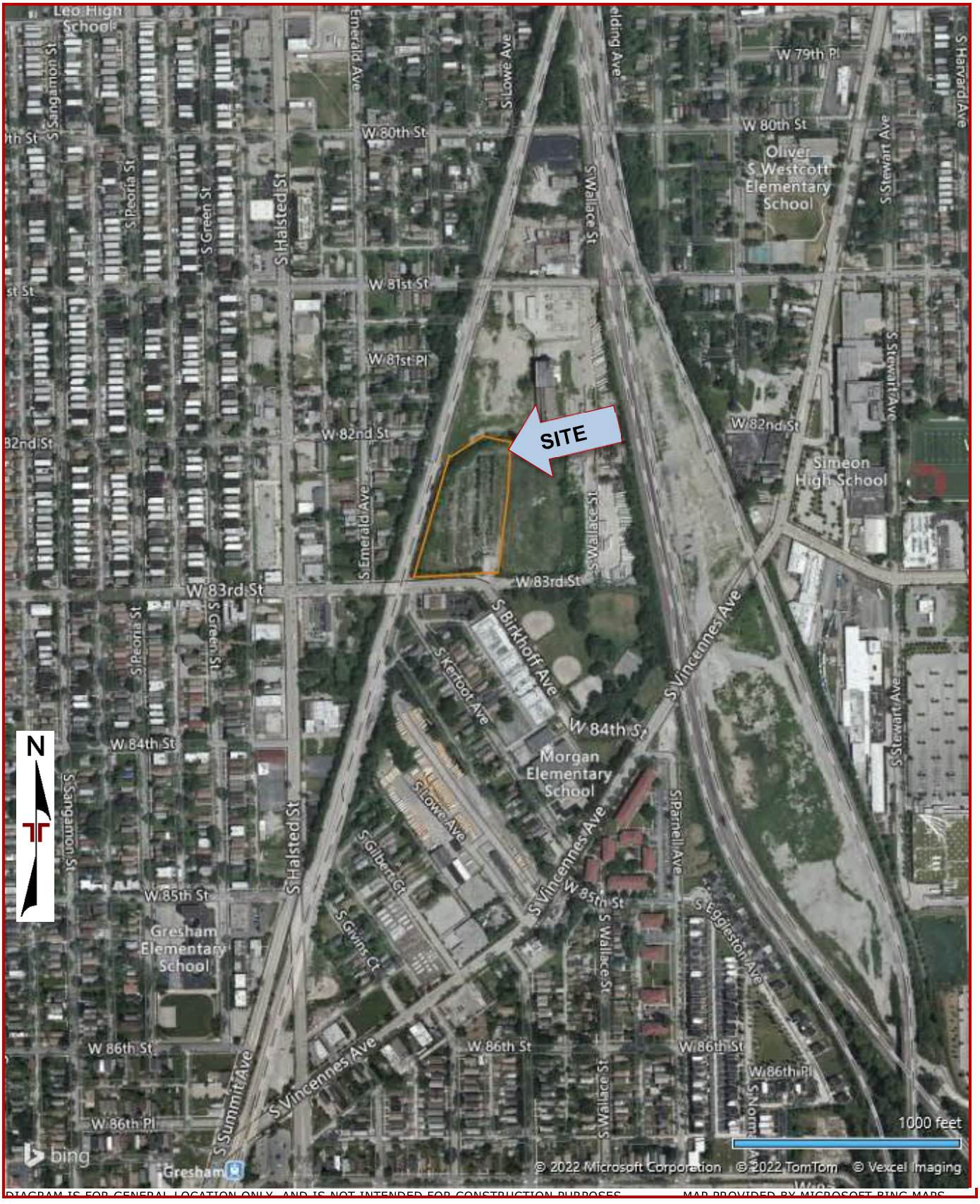
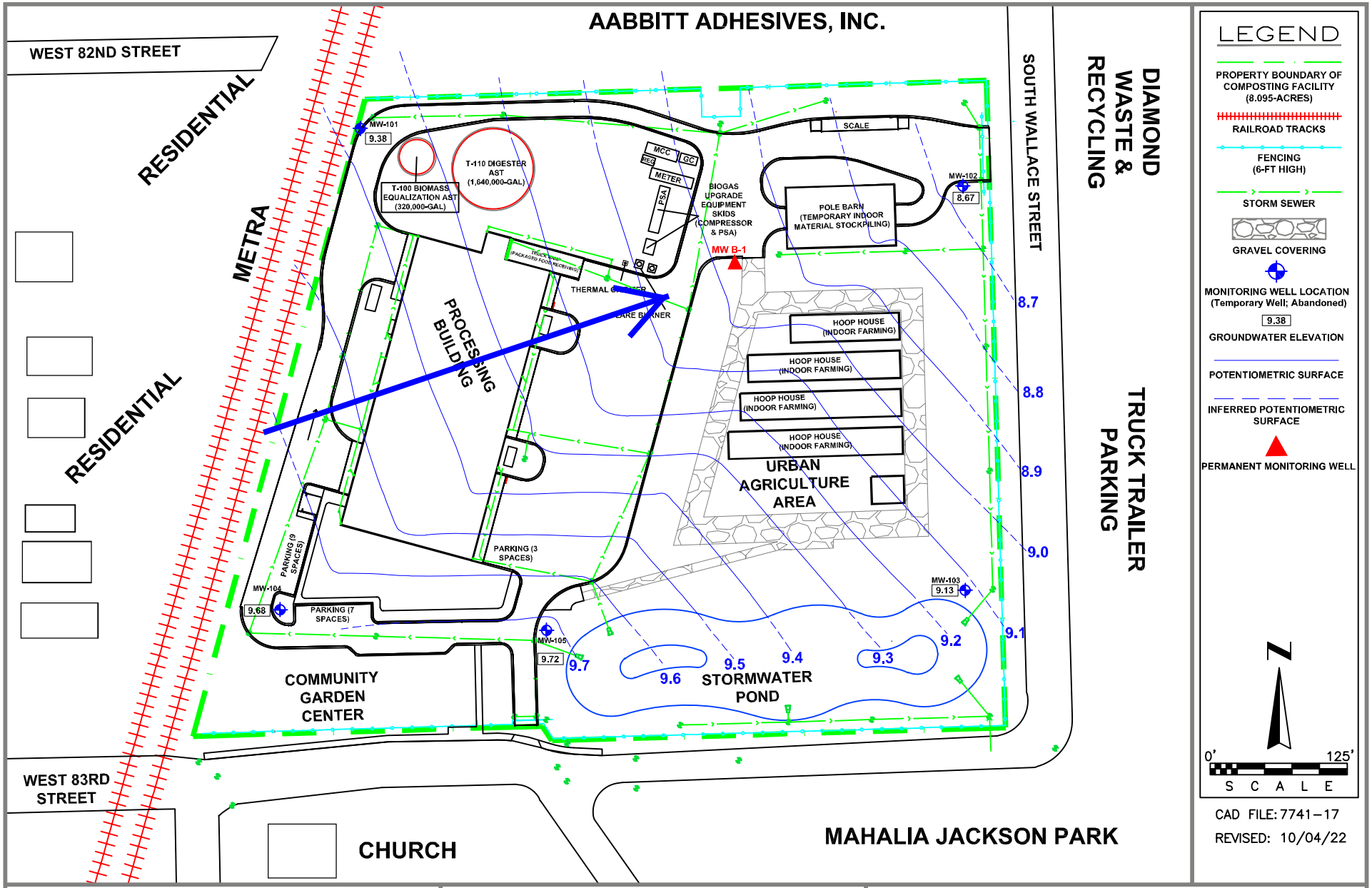


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES. MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 2
POTENTIOMETRIC SURFACE MAP
(SEPTEMBER 30, 2022)

Exploration and Laboratory Results

Contents:

Note: All attachments are one page unless noted above.

BORING LOG NO. MW-B1

PROJECT: Green Era Biotechnology Plant

CLIENT: Green Era Educational NFP
Chicago, IL

SITE: 650 West 83rd Street
Chicago, IL

LOCATION See Exploration Plan

Latitude: 41.7447° Longitude: -87.6401°

DEPTH	GRAPHIC LOG	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	LABORATORY HP (tsf)	STRENGTH TEST: TEST TYPE	STRENGTH TEST: COMPRESSIVE STRENGTH (tsf)	STRENGTH TEST: STRAIN (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS: LL-PL-PI
0.6												
	TOPSOIL (7" Thick)											
	FILL - LEAN CLAY, wtrace silt, sand, gravel and brick pieces, dark brown			13	3-3-4-6 N=7	3.00 (HP)				22.0		
				15	5-5-5-4 N=10	3.50 (HP)				18.5		
5.0												
	FILL - TOPSOIL FILL, with sand and gravel, dark brown			14	2-2-4-9 N=6					13.2		
7.0												
	LEAN CLAY (CL), trace sand and gravel, gray to brownish gray, stiff			13	3-3-3-4 N=6	2.00 (HP)				18.6		
10		▽		18	3-4-5-5 N=9	dist.				23.1		
				18						30.7		
15								0.94	15	22.7	104	
16.0												
	Boring Terminated at 16 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3.25" Hollow Stem Auger

Abandonment Method:
2-inch permenant well constructed

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *10.0' while drilling*

Terracon
650 W Lake St, Ste 420
Chicago, IL

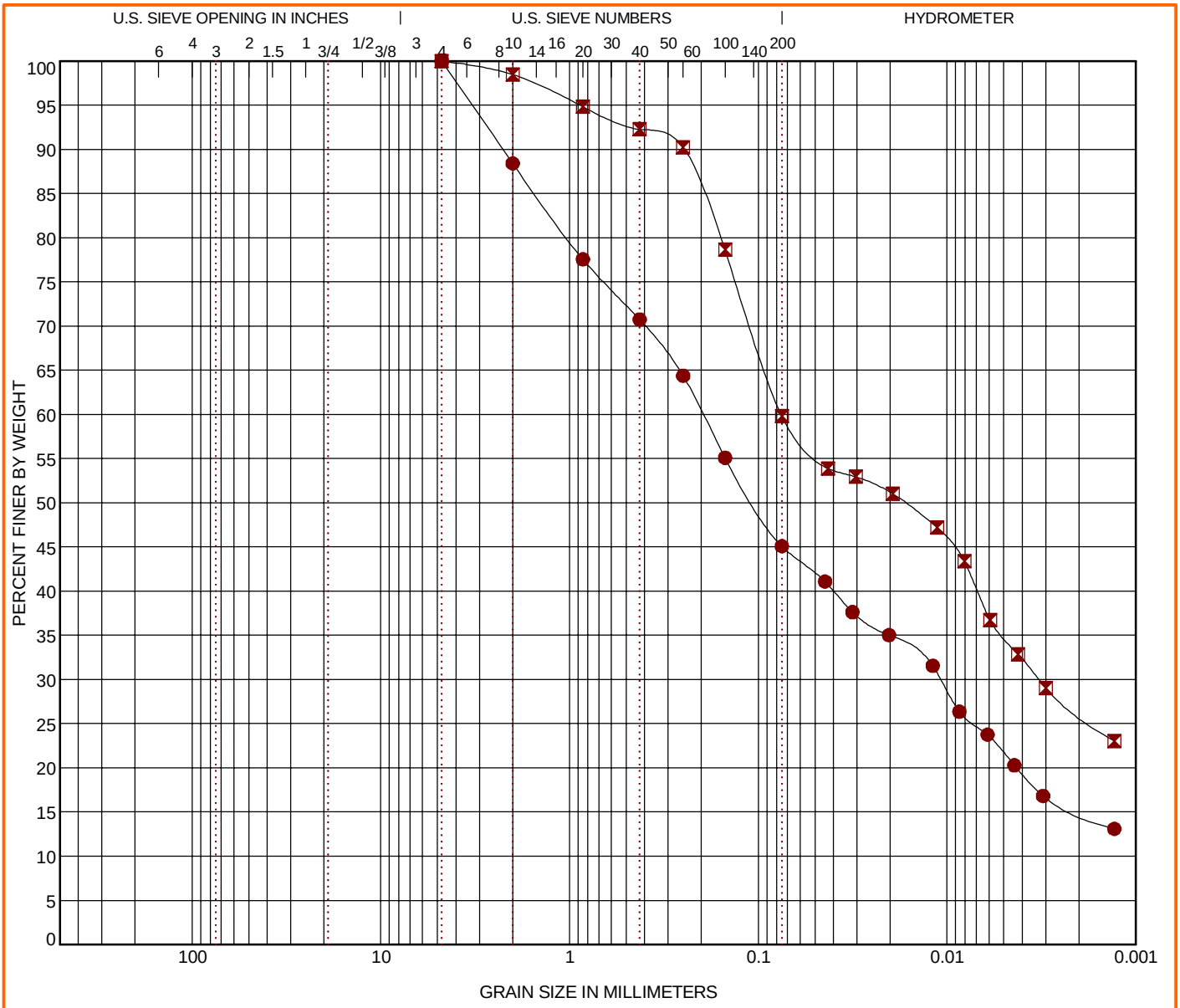
Boring Started: 10-06-2022 | Boring Completed: 10-06-2022

Drill Rig: D-50 | Driller: Geocon/Ken

Project No.: A2207015

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID		Depth (Ft)	USCS Classification	WC (%)	LL	PL	PI	Cc	Cu
●	B-1 BULK	5 - 8	DARK GRAY SILTY SAND WITH CLAY (SM)						
⊠	B-1 BULK	13 - 15	DARK BROWNISH GRAY SANDY LEAN CLAY (CL)						

Boring ID		Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Silt	%Fines	%Clay
●	B-1 BULK	5 - 8	4.75	0.196	0.011		0.0	0.0	54.9	23.4		21.6
⊠	B-1 BULK	13 - 15	4.75	0.076	0.003		0.0	0.0	40.2	25.0		34.8

PROJECT: Environmental Remediation Services - 650 West 83rd Street

SITE: 650 West 83rd Street Chicago, IL

Terracon
650 W Lake St, Ste 420
Chicago, IL

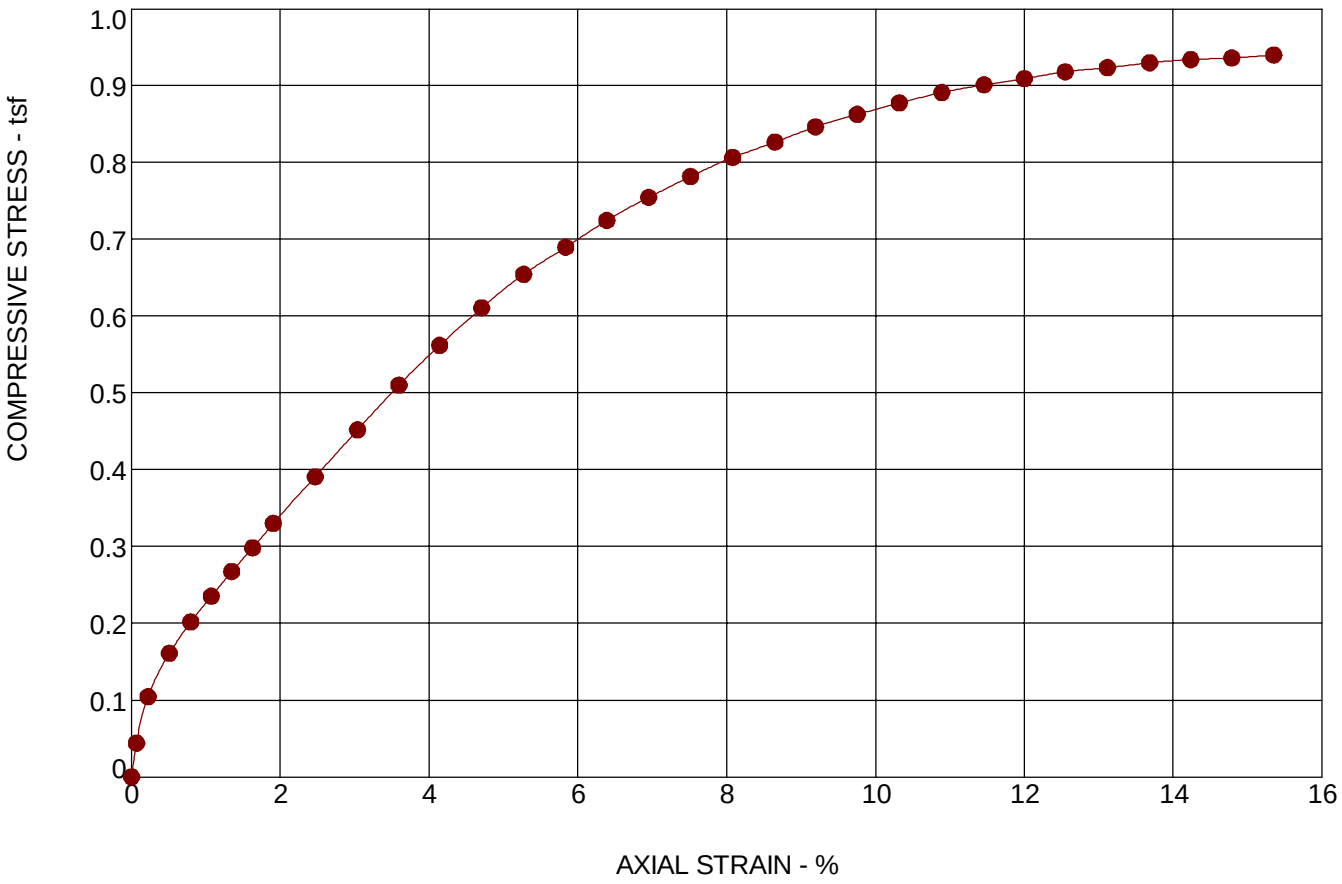
PROJECT NUMBER: A2207015

CLIENT: Green Era Educational NFP Chicago, IL

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 A2207015.GPJ TERRACON_DATATEMPLATE.GDT 10/19/22

UNCONFINED COMPRESSION TEST

ASTM D2166



SPECIMEN FAILURE PHOTOGRAPH

SPECIMEN TEST DATA

Moisture Content:	%	22.7
Dry Density:	pcf	104
Diameter:	in.	2.84
Height:	in.	5.92
Height / Diameter Ratio:		2.08
Calculated Saturation:	%	98.19
Calculated Void Ratio:		0.63
Assumed Specific Gravity:		2.72
Failure Strain:	%	15.00
Unconfined Compressive Strength	(tsf)	0.94
Undrained Shear Strength:	(tsf)	0.47
Strain Rate:	in/min	0.0598
Remarks:		

SAMPLE TYPE: Shelby Tube

SAMPLE LOCATION: 201-3 @ 14 - 16 feet

DESCRIPTION: BROWNISH GRAY LEAN CLAY TRACE SAND AND GRAVEL

LL	PL	PI	Percent < #200 Sieve

PROJECT: Environmental Remediation Services - 650 West 83rd Street

SITE: 650 West 83rd Street
Chicago, IL

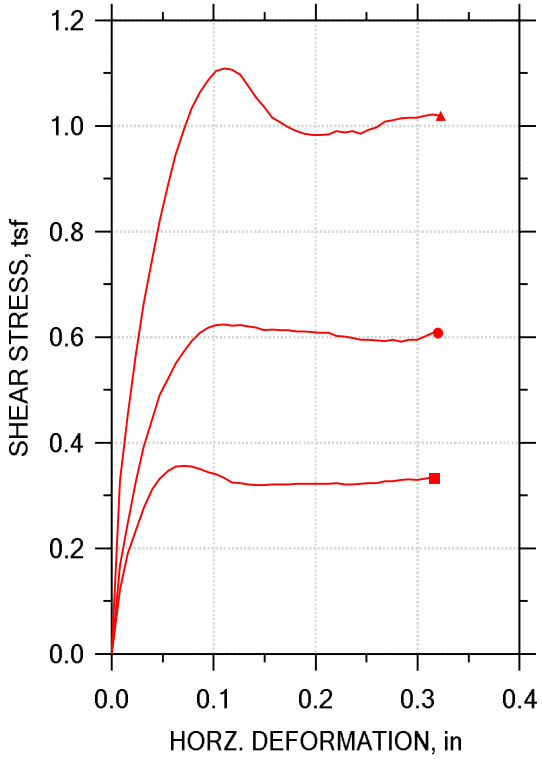
Terracon
650 W Lake St, Ste 420
Chicago, IL

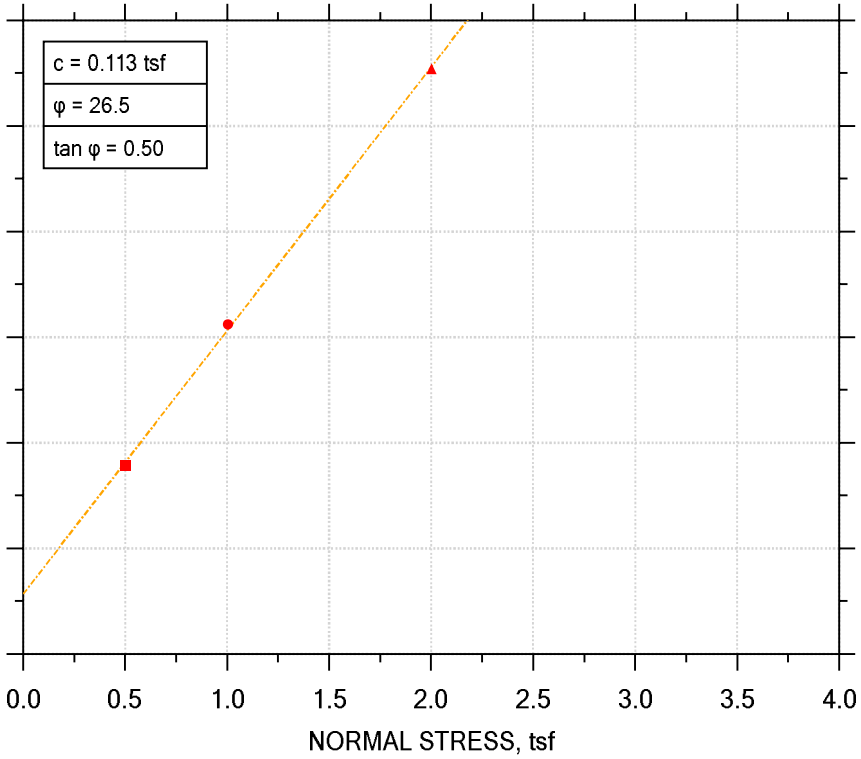
PROJECT NUMBER: A2207015

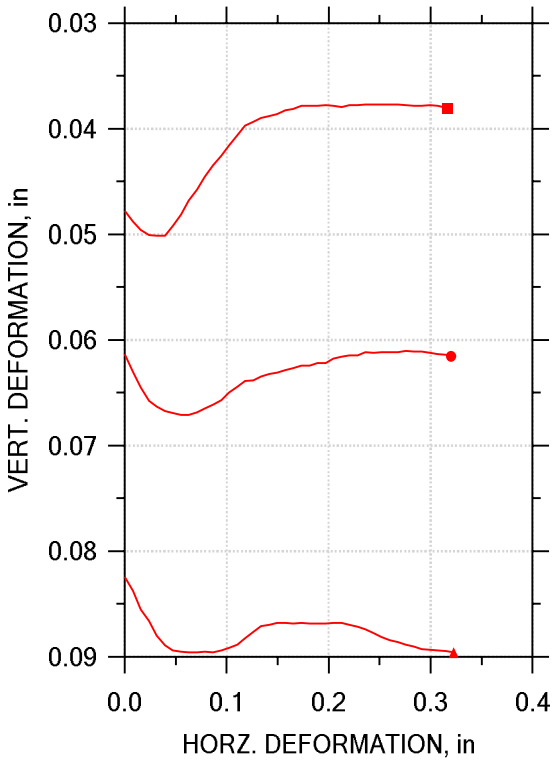
CLIENT: Green Era Educational NFP
Chicago, IL

Direct Shear Test of Soils Under Consolidated Drained Conditions
ASTM D3080

DIRECT SHEAR STRENGTH OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080







Symbol		■	●	▲	
Test No.		0.5 TSF	1.0 TSF	2.0 TSF	
Sample No.		A	B	C	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.502	2.5008	2.5016	
	Area, in²	4.9165	4.9118	4.9149	
	Height, in	0.99567	0.99567	0.99291	
	Water Content, %	18.63	18.65	18.57	
	Dry Density, pcf	99.94	99.41	99.71	
	Saturation, %	72.13	71.26	71.47	
	Void Ratio	0.7053	0.71446	0.70931	
Consol. Height, in		0.94792	0.93431	0.91046	
Consol. Void Ratio		0.62353	0.60881	0.56737	
Final	Water Content, %	23.33	22.19	20.26	
	Dry Density, pcf	103.9	106.0	109.6	
	Saturation, %	99.50	99.55	99.65	
	Void Ratio	0.64013	0.60851	0.55506	
Normal Stress, tsf		0.50109	1.0031	2.001	
Max. Shear Stress, tsf		0.35662	0.62446	1.1086	
Ult. Shear Stress, tsf		0.33248	0.60791	1.0196	
Time to Failure, min		17.261	28.962	28.019	
Disp. Rate, in/min		0.0041969	0.0041969	0.0041969	
Estimated Specific Gravity		2.73	2.73	2.73	
Liquid Limit		---	---	---	
Plastic Limit		---	---	---	
Plasticity Index		---	---	---	

Project: ENVIRON REM. GREEN ERA
Location: 650 WEST 83RD ST
Project No.: A2207015
Boring No.: 201-3 6'-8'
Sample Type: 3.0" ST
Description: GRAY SANDY CLAY WITH SILT (CL)
Remarks: TEST PERFORMED AS PER ASTM D3080. SPECIMEN REMOLDED TO APPROX 100.0 PCF @ NATURAL WC

DIRECT SHEAR TEST DATA

Project: ENVIRON REM. GREEN ERA
Boring No.: 201-3 6'-8'
Sample No.: A
Test No.: 0.5 TSF

Location: 650 WEST 83RD ST
Tested By: BCM
Test Date: 11/4/2022
Sample Type: 3.0" ST

Project No.: A2207015
Checked By: WPQ
Depth: 6.0'-8.0'
Elevation: ----

Soil Description: GRAY SANDY CLAY WITH SILT (CL)
Remarks: TEST PERFORMED AS PER ASTM D3080. SPECIMEN REMOLDED TO APPROX 100.0 PCF @ NATURAL WC

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	0.499	0.04775	0.000	0.0000	0.0000
2	2.05	0.499	0.04882	0.122	0.007903	0.007903
3	4.14	0.499	0.04955	0.190	0.01576	0.01576
4	6.02	0.499	0.05009	0.236	0.02366	0.02366
5	7.86	0.500	0.05015	0.276	0.03151	0.03151
6	9.93	0.501	0.05015	0.312	0.03942	0.03942
7	11.66	0.501	0.04922	0.332	0.04727	0.04727
8	13.51	0.502	0.04815	0.347	0.05513	0.05513
9	15.35	0.502	0.04681	0.355	0.06303	0.06303
10	17.26	0.501	0.04574	0.357	0.07088	0.07088
11	19.01	0.502	0.04454	0.355	0.07879	0.07879
12	20.89	0.500	0.04347	0.350	0.08669	0.08669
13	22.77	0.500	0.04253	0.345	0.09450	0.09450
14	24.46	0.501	0.04159	0.340	0.1024	0.1024
15	26.44	0.501	0.04059	0.333	0.1103	0.1103
16	28.46	0.500	0.03972	0.325	0.1182	0.1182
17	30.07	0.501	0.03932	0.323	0.1260	0.1260
18	32.05	0.501	0.03899	0.321	0.1339	0.1339
19	33.92	0.500	0.03878	0.320	0.1418	0.1418
20	35.71	0.499	0.03858	0.320	0.1496	0.1496
21	37.68	0.500	0.03825	0.321	0.1575	0.1575
22	39.33	0.500	0.03812	0.321	0.1654	0.1654
23	41.39	0.500	0.03785	0.321	0.1732	0.1732
24	43.12	0.499	0.03785	0.322	0.1811	0.1811
25	44.94	0.499	0.03785	0.322	0.1890	0.1890
26	46.89	0.499	0.03778	0.322	0.1969	0.1969
27	48.75	0.500	0.03785	0.322	0.2047	0.2047
28	50.71	0.499	0.03792	0.323	0.2126	0.2126
29	52.37	0.499	0.03778	0.324	0.2205	0.2205
30	54.36	0.499	0.03778	0.321	0.2284	0.2284
31	56.13	0.499	0.03771	0.321	0.2363	0.2363
32	58.12	0.500	0.03771	0.323	0.2441	0.2441
33	59.85	0.499	0.03771	0.324	0.2520	0.2520
34	61.68	0.499	0.03771	0.324	0.2599	0.2599
35	63.54	0.500	0.03771	0.327	0.2677	0.2677
36	65.51	0.499	0.03778	0.327	0.2756	0.2756
37	67.40	0.499	0.03785	0.329	0.2835	0.2835
38	69.23	0.499	0.03785	0.330	0.2913	0.2913
39	71.16	0.499	0.03778	0.330	0.2992	0.2992
40	73.05	0.499	0.03785	0.332	0.3071	0.3071
41	74.65	0.499	0.03798	0.334	0.3150	0.3150
42	75.17	0.499	0.03805	0.332	0.3170	0.3170

DIRECT SHEAR TEST DATA

Project: ENVIRON REM. GREEN ERA
Boring No.: 201-3 6'-8'
Sample No.: B
Test No.: 1.0 TSF

Location: 650 WEST 83RD ST
Tested By: BCM
Test Date: 11/4/2022
Sample Type: 3.0" ST

Project No.: A2207015
Checked By: WPQ
Depth: 6.0'-8.0'
Elevation: ----

Soil Description: GRAY SANDY CLAY WITH SILT (CL)
Remarks: TEST PERFORMED AS PER ASTM D3080. SPECIMEN REMOLDED TO APPROX 100.0 PCF @ NATURAL WC

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	1.00	0.06136	0.000	0.0000	0.0000
2	4.66	0.998	0.06301	0.169	0.007903	0.007903
3	6.61	1.00	0.06448	0.247	0.01576	0.01576
4	8.55	0.999	0.06578	0.328	0.02366	0.02366
5	10.41	1.00	0.06631	0.393	0.03151	0.03151
6	12.21	1.00	0.06672	0.443	0.03942	0.03942
7	14.09	1.00	0.06690	0.490	0.04727	0.04727
8	15.96	1.00	0.06708	0.521	0.05513	0.05513
9	17.76	1.00	0.06708	0.550	0.06303	0.06303
10	19.59	1.00	0.06684	0.573	0.07088	0.07088
11	21.56	1.00	0.06649	0.592	0.07879	0.07879
12	23.47	1.00	0.06613	0.608	0.08664	0.08664
13	25.15	1.00	0.06572	0.618	0.09450	0.09450
14	27.10	1.00	0.06495	0.623	0.1024	0.1024
15	28.96	1.00	0.06442	0.624	0.1103	0.1103
16	30.89	1.00	0.06389	0.622	0.1182	0.1182
17	32.58	1.00	0.06383	0.623	0.1260	0.1260
18	34.43	1.00	0.06348	0.621	0.1339	0.1339
19	36.35	1.00	0.06324	0.618	0.1418	0.1418
20	38.26	1.00	0.06307	0.614	0.1496	0.1496
21	40.19	1.00	0.06283	0.614	0.1575	0.1575
22	42.08	1.00	0.06265	0.613	0.1654	0.1654
23	43.70	1.00	0.06242	0.613	0.1732	0.1732
24	45.65	1.00	0.06242	0.611	0.1811	0.1811
25	47.59	1.00	0.06218	0.611	0.1890	0.1890
26	49.27	1.00	0.06218	0.610	0.1969	0.1969
27	51.27	1.00	0.06177	0.608	0.2047	0.2047
28	53.25	1.00	0.06159	0.608	0.2126	0.2126
29	55.14	1.00	0.06147	0.603	0.2205	0.2205
30	56.82	1.00	0.06147	0.601	0.2284	0.2284
31	58.69	1.00	0.06118	0.599	0.2363	0.2363
32	60.69	1.00	0.06124	0.595	0.2441	0.2441
33	62.50	1.00	0.06118	0.596	0.2520	0.2520
34	64.30	1.00	0.06118	0.593	0.2599	0.2599
35	66.23	1.00	0.06118	0.593	0.2677	0.2677
36	68.02	1.00	0.06106	0.595	0.2756	0.2756
37	69.86	1.00	0.06112	0.592	0.2835	0.2835
38	71.78	1.00	0.06112	0.595	0.2913	0.2913
39	73.52	1.00	0.06124	0.595	0.2992	0.2992
40	75.45	1.00	0.06136	0.602	0.3071	0.3071
41	77.24	1.00	0.06141	0.609	0.3150	0.3150
42	78.38	1.00	0.06153	0.608	0.3200	0.3200

DIRECT SHEAR TEST DATA

Project: ENVIRON REM. GREEN ERA
Boring No.: 201-3 6'-8'
Sample No.: C
Test No.: 2.0 TSF

Location: 650 WEST 83RD ST
Tested By: BCM
Test Date: 11/4/2022
Sample Type: 3.0" ST

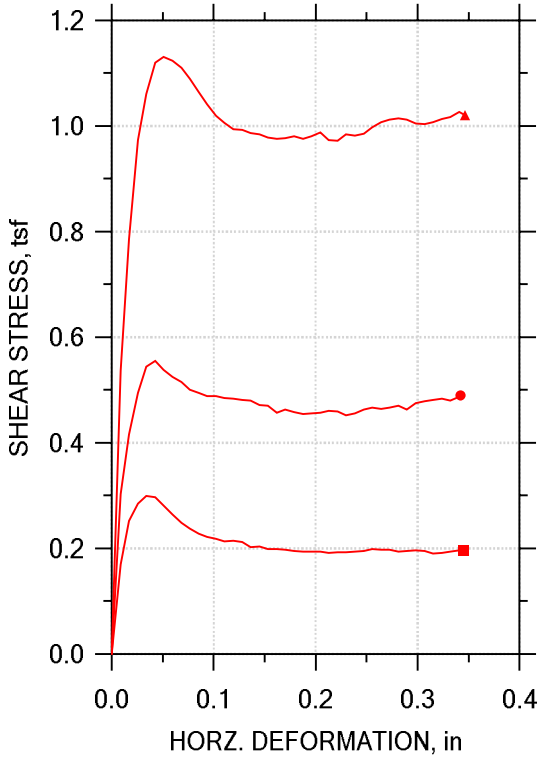
Project No.: A2207015
Checked By: WPQ
Depth: 6.0'-8.0'
Elevation: ----

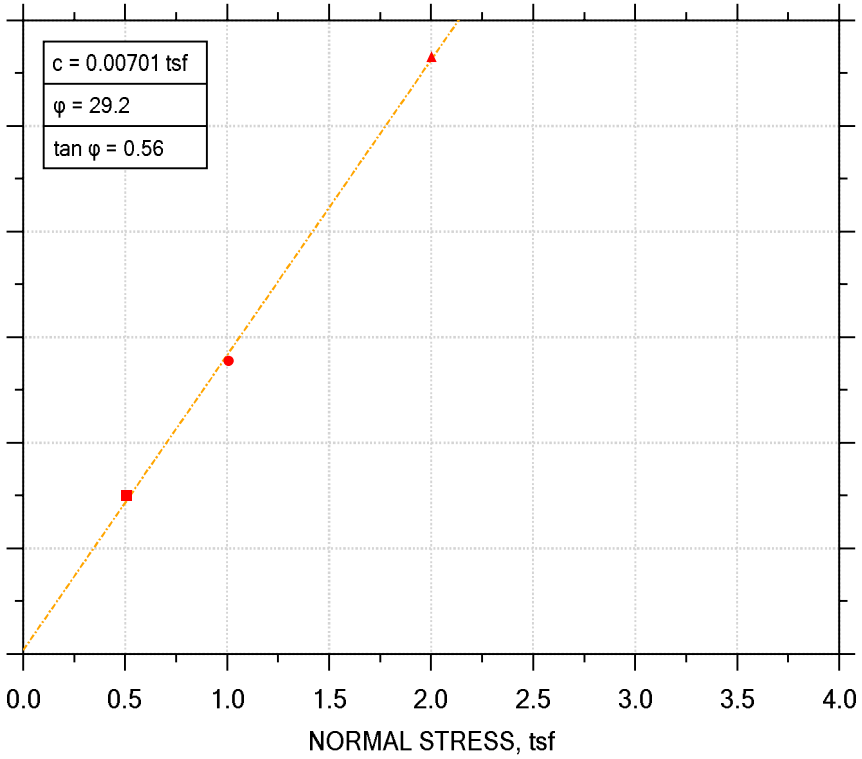
Soil Description: GRAY SANDY CLAY WITH SILT (CL)
Remarks: TEST PERFORMED AS PER ASTM D3080. SPECIMEN REMOLDED TO APPROX 100.0 PCF @ NATURAL WC

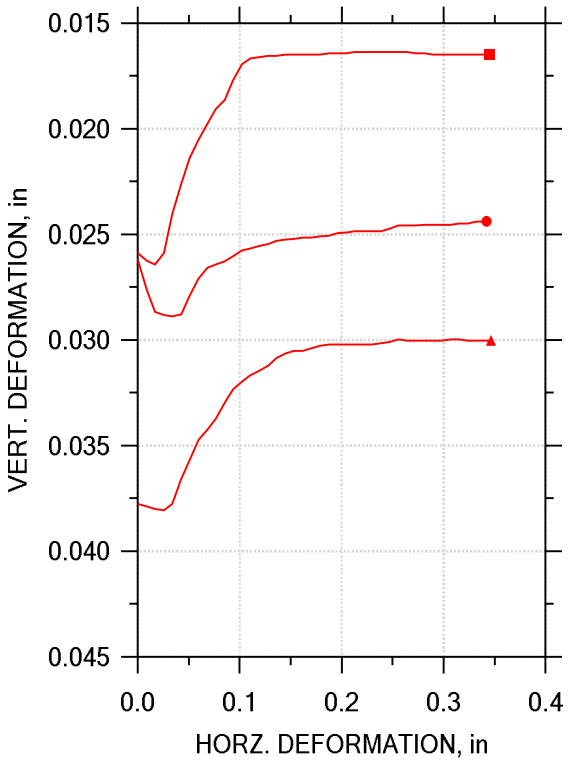
Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	2.00	0.08245	0.000	0.0000	0.0000
2	3.71	2.00	0.08379	0.330	0.007903	0.007903
3	5.42	2.00	0.08553	0.453	0.01576	0.01576
4	7.40	2.00	0.08660	0.570	0.02366	0.02366
5	9.31	2.00	0.08800	0.664	0.03151	0.03151
6	11.21	2.00	0.08894	0.747	0.03942	0.03942
7	13.09	2.00	0.08941	0.820	0.04727	0.04727
8	15.06	2.00	0.08954	0.888	0.05513	0.05513
9	16.96	2.00	0.08961	0.947	0.06303	0.06303
10	18.77	2.00	0.08961	0.994	0.07088	0.07088
11	20.60	2.00	0.08954	1.03	0.07879	0.07879
12	22.46	2.00	0.08961	1.06	0.08664	0.08664
13	24.33	2.00	0.08941	1.09	0.09450	0.09450
14	26.33	2.00	0.08914	1.10	0.1024	0.1024
15	28.02	2.00	0.08887	1.11	0.1103	0.1103
16	29.86	2.00	0.08827	1.11	0.1182	0.1182
17	31.91	2.00	0.08767	1.10	0.1260	0.1260
18	33.73	2.00	0.08706	1.08	0.1339	0.1339
19	35.57	2.00	0.08700	1.05	0.1418	0.1418
20	37.19	2.00	0.08680	1.04	0.1496	0.1496
21	39.19	2.00	0.08680	1.02	0.1575	0.1575
22	41.05	2.00	0.08686	1.01	0.1654	0.1654
23	42.84	2.00	0.08680	0.998	0.1732	0.1732
24	44.81	2.00	0.08686	0.990	0.1811	0.1811
25	46.77	2.00	0.08686	0.985	0.1890	0.1890
26	48.62	2.00	0.08686	0.983	0.1969	0.1969
27	50.29	2.00	0.08680	0.984	0.2047	0.2047
28	52.25	2.00	0.08680	0.984	0.2126	0.2126
29	54.16	2.00	0.08700	0.990	0.2205	0.2205
30	55.97	2.00	0.08713	0.987	0.2284	0.2284
31	57.84	2.00	0.08740	0.990	0.2363	0.2363
32	59.73	2.00	0.08773	0.985	0.2442	0.2442
33	61.51	2.00	0.08813	0.993	0.2520	0.2520
34	63.39	2.00	0.08840	0.997	0.2599	0.2599
35	65.27	2.00	0.08860	1.01	0.2677	0.2677
36	67.06	2.00	0.08887	1.01	0.2756	0.2756
37	69.01	2.00	0.08900	1.01	0.2835	0.2835
38	70.90	2.00	0.08927	1.02	0.2913	0.2913
39	72.69	2.00	0.08934	1.02	0.2992	0.2992
40	74.51	2.00	0.08941	1.02	0.3071	0.3071
41	76.27	2.00	0.08947	1.02	0.3150	0.3150
42	78.19	2.00	0.08961	1.02	0.3225	0.3225

DIRECT SHEAR STRENGTH OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080







Symbol		■	●	▲	
Test No.		0.5 TSF	1.0 TSF	2.0 TSF	
Sample No.		A	B	C	
Shape		Circular	Circular	Circular	
Initial	Dimension, in	2.4988	2.4929	2.5008	
	Area, in²	4.9041	4.8809	4.9118	
	Height, in	0.99449	1.0047	0.99094	
	Water Content, %	25.33	24.35	25.97	
	Dry Density, pcf	100.6	100.9	99.94	
	Saturation, %	98.52	95.42	99.47	
	Void Ratio	0.70692	0.70168	0.71786	
Consol. Height, in		0.96862	0.97855	0.95319	
Consol. Void Ratio		0.66252	0.65735	0.6524	
Final	Water Content, %	24.48	23.17	22.16	
	Dry Density, pcf	102.3	103.4	103.1	
	Saturation, %	99.20	96.49	91.53	
	Void Ratio	0.67862	0.66038	0.66582	
Normal Stress, tsf		0.50553	1.0063	2.0023	
Max. Shear Stress, tsf		0.29919	0.55522	1.1312	
Ult. Shear Stress, tsf		0.19666	0.48978	1.0209	
Time to Failure, min		8.7877	9.5757	11.617	
Disp. Rate, in/min		0.0043268	0.0043268	0.0043268	
Estimated Specific Gravity		2.75	2.75	2.75	
Liquid Limit		---	---	---	
Plastic Limit		---	---	---	
Plasticity Index		---	---	---	

Project: ENVIRON REM. GREEN ERA
Location: 650 WEST 83RD ST
Project No.: A2207015
Boring No.: 201-3 12'-14'
Sample Type: REMOLDED
Description: BROWN SILTY SAND TRACE CLAY (SM)
Remarks: TEST PERFORMED AS PER ASTM D3080. SPECIMEN REMOLDED TO APPROX 100.0 PCF @ NATURAL WC

DIRECT SHEAR TEST DATA

Project: ENVIRON REM. GREEN ERA
Boring No.: 201-3 12'-14'
Sample No.: A
Test No.: 0.5 TSF

Location: 650 WEST 83RD ST
Tested By: BCM
Test Date: 11/4/2022
Sample Type: REMOLDED

Project No.: A2207015
Checked By: WPQ
Depth: 12.0'-14.0'
Elevation: ----

Soil Description: BROWN SILTY SAND TRACE CLAY (SM)
Remarks: TEST PERFORMED AS PER ASTM D3080. SPECIMEN REMOLDED TO APPROX 100.0 PCF @ NATURAL WC

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	0.502	0.02587	0.000	0.0000	0.0000
2	3.13	0.499	0.02624	0.170	0.008548	0.008548
3	5.18	0.502	0.02643	0.252	0.01704	0.01704
4	7.00	0.504	0.02587	0.285	0.02559	0.02559
5	8.79	0.506	0.02404	0.299	0.03409	0.03409
6	10.49	0.504	0.02259	0.296	0.04264	0.04264
7	12.27	0.502	0.02140	0.281	0.05113	0.05113
8	13.93	0.503	0.02052	0.264	0.05963	0.05963
9	15.59	0.503	0.01976	0.248	0.06818	0.06818
10	17.48	0.502	0.01907	0.237	0.07667	0.07667
11	19.35	0.502	0.01863	0.228	0.08522	0.08522
12	21.18	0.502	0.01768	0.222	0.09372	0.09372
13	22.97	0.502	0.01693	0.218	0.1022	0.1022
14	24.79	0.502	0.01668	0.214	0.1108	0.1108
15	26.57	0.502	0.01661	0.215	0.1193	0.1193
16	28.57	0.502	0.01655	0.212	0.1278	0.1278
17	30.26	0.501	0.01655	0.203	0.1363	0.1363
18	32.02	0.503	0.01649	0.203	0.1448	0.1448
19	33.84	0.503	0.01649	0.199	0.1533	0.1533
20	35.56	0.502	0.01649	0.199	0.1618	0.1618
21	37.30	0.502	0.01649	0.198	0.1704	0.1704
22	39.18	0.502	0.01649	0.195	0.1789	0.1789
23	40.92	0.502	0.01643	0.193	0.1874	0.1874
24	42.83	0.502	0.01643	0.194	0.1959	0.1959
25	44.62	0.502	0.01643	0.194	0.2044	0.2044
26	46.54	0.499	0.01636	0.192	0.2130	0.2130
27	48.27	0.502	0.01636	0.192	0.2215	0.2215
28	50.13	0.501	0.01636	0.192	0.2300	0.2300
29	51.93	0.502	0.01636	0.194	0.2385	0.2385
30	53.79	0.502	0.01636	0.195	0.2470	0.2470
31	55.50	0.502	0.01636	0.198	0.2556	0.2556
32	57.23	0.502	0.01636	0.198	0.2641	0.2641
33	59.13	0.502	0.01643	0.198	0.2726	0.2726
34	60.80	0.498	0.01643	0.194	0.2811	0.2811
35	62.50	0.502	0.01649	0.196	0.2896	0.2896
36	64.25	0.502	0.01649	0.196	0.2982	0.2982
37	66.07	0.500	0.01649	0.195	0.3066	0.3066
38	68.06	0.499	0.01649	0.190	0.3151	0.3151
39	69.72	0.502	0.01649	0.192	0.3237	0.3237
40	71.72	0.502	0.01649	0.193	0.3322	0.3322
41	73.55	0.501	0.01649	0.196	0.3407	0.3407
42	74.40	0.502	0.01649	0.197	0.3446	0.3446

DIRECT SHEAR TEST DATA

Project: ENVIRON REM. GREEN ERA | Location: 650 WEST 83RD SCEDAR RAPIDS, IA | Project No.: A2207015
Boring No.: 201-3 | Tested By: BCM | Checked By: WPQ
Sample No.: B | Test Date: 11/4/2022 | Depth: 12.0'-14.0'
Test No.: 1.0 TSF | Sample Type: REMOLDED | Elevation: ----

Soil Description: BROWN SILTY SAND TRACE CLAY (SM)
Remarks: TEST PERFORMED AS PER ASTM D3080. SPECIMEN REMOLDED TO APPROX 100.0 PCF @ NATURAL WC

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	1.00	0.02617	0.000	0.0000	0.0000
2	2.19	1.00	0.02761	0.304	0.008548	0.008548
3	3.99	1.00	0.02868	0.416	0.01704	0.01704
4	6.02	1.01	0.02883	0.495	0.02559	0.02559
5	7.84	1.01	0.02888	0.545	0.03409	0.03409
6	9.58	1.01	0.02878	0.556	0.04264	0.04264
7	11.40	1.01	0.02791	0.539	0.05113	0.05113
8	13.12	1.01	0.02709	0.525	0.05963	0.05963
9	15.02	1.01	0.02658	0.516	0.06818	0.06818
10	16.78	1.01	0.02643	0.502	0.07667	0.07667
11	18.43	1.01	0.02628	0.495	0.08522	0.08522
12	20.26	1.01	0.02602	0.489	0.09372	0.09372
13	22.01	1.01	0.02577	0.489	0.1022	0.1022
14	23.98	1.01	0.02566	0.486	0.1108	0.1108
15	25.86	1.01	0.02556	0.485	0.1193	0.1193
16	27.63	1.00	0.02546	0.482	0.1278	0.1278
17	29.32	1.00	0.02531	0.481	0.1363	0.1363
18	31.18	1.00	0.02525	0.472	0.1448	0.1448
19	32.92	1.01	0.02520	0.471	0.1533	0.1533
20	34.77	1.00	0.02515	0.458	0.1618	0.1618
21	36.51	1.00	0.02515	0.463	0.1704	0.1704
22	38.33	1.01	0.02510	0.459	0.1789	0.1789
23	40.13	1.01	0.02505	0.456	0.1874	0.1874
24	41.87	1.00	0.02495	0.457	0.1959	0.1959
25	43.82	1.01	0.02490	0.458	0.2044	0.2044
26	45.59	1.00	0.02485	0.462	0.2130	0.2130
27	47.26	1.00	0.02485	0.460	0.2215	0.2215
28	49.17	1.00	0.02485	0.453	0.2300	0.2300
29	50.81	1.01	0.02485	0.456	0.2385	0.2385
30	52.66	1.01	0.02474	0.463	0.2470	0.2470
31	54.40	1.00	0.02459	0.467	0.2556	0.2556
32	56.36	1.01	0.02459	0.465	0.2641	0.2641
33	58.00	1.01	0.02459	0.467	0.2726	0.2726
34	59.78	1.00	0.02454	0.471	0.2811	0.2811
35	61.62	1.00	0.02454	0.464	0.2896	0.2896
36	63.59	1.01	0.02454	0.476	0.2982	0.2982
37	65.44	1.01	0.02454	0.480	0.3066	0.3066
38	67.14	1.01	0.02449	0.482	0.3151	0.3151
39	68.93	1.00	0.02449	0.485	0.3237	0.3237
40	70.75	1.01	0.02439	0.481	0.3322	0.3322
41	72.38	1.00	0.02439	0.488	0.3407	0.3407
42	72.67	1.00	0.02439	0.491	0.3420	0.3420

DIRECT SHEAR TEST DATA

Project: ENVIRON REM. GREEN ERA | Location: 650 WEST 83RD ST | Project No.: A2207015
Boring No.: 201-3 | Tested By: BCM | Checked By: WPQ
Sample No.: C | Test Date: 11/4/2022 | Depth: 12.0'-14.0'
Test No.: 2.0 TSF | Sample Type: REMOLDED | Elevation: ----

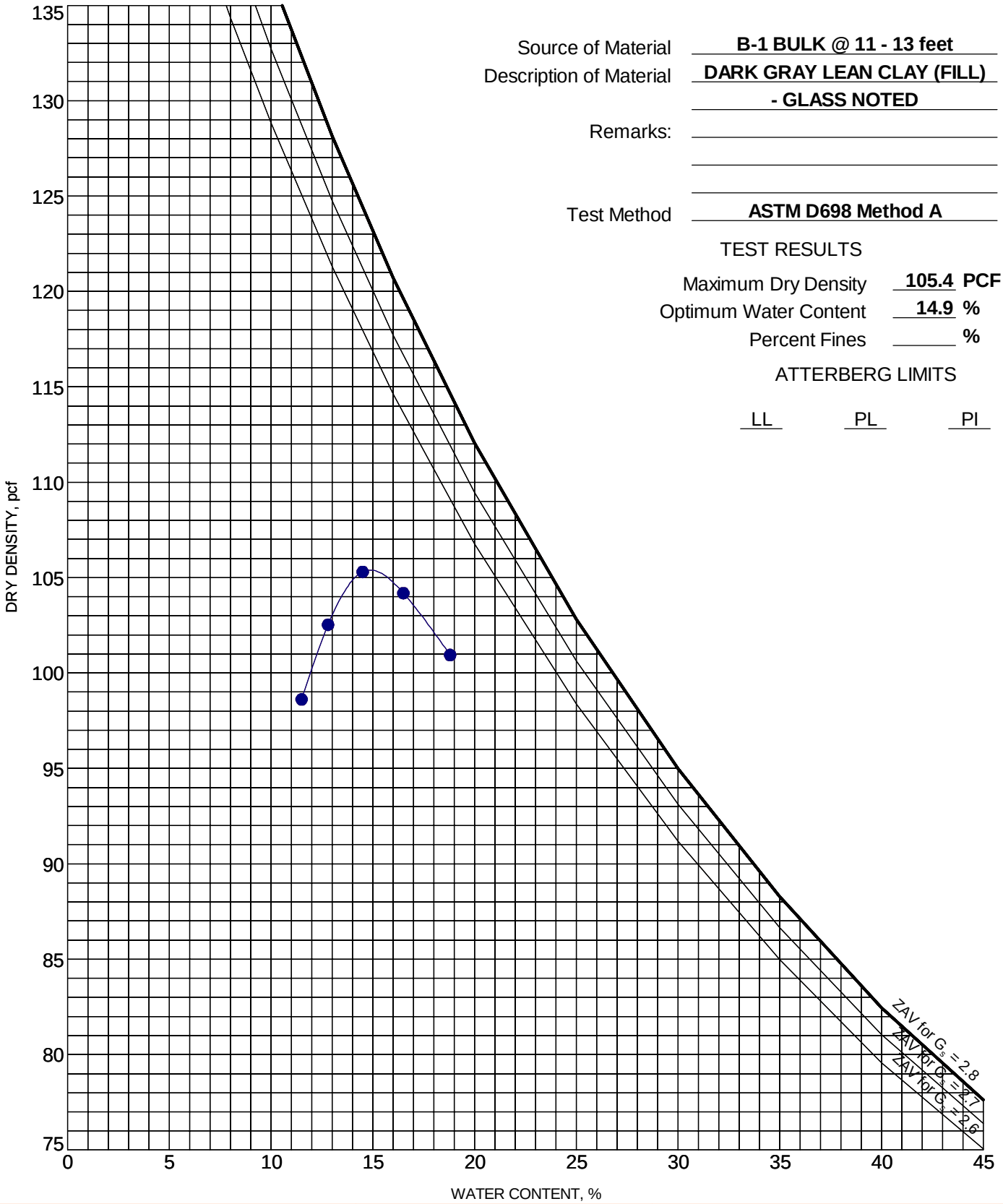
Soil Description: BROWN SILTY SAND TRACE CLAY (SM)
Remarks: TEST PERFORMED AS PER ASTM D3080. SPECIMEN REMOLDED TO APPROX 100.0 PCF @ NATURAL WC

Step: 1 of 1

	Elapsed Time min	Vertical Stress tsf	Vertical Displacement in	Horizontal Stress tsf	Horizontal Displacement in	Cumulative Displacement in
1	0.00	2.00	0.03776	0.000	0.0000	0.0000
2	2.28	2.00	0.03789	0.538	0.008548	0.008548
3	4.22	2.00	0.03801	0.788	0.01704	0.01704
4	6.28	2.00	0.03807	0.975	0.02559	0.02559
5	8.07	2.00	0.03776	1.06	0.03414	0.03414
6	10.00	2.00	0.03656	1.12	0.04264	0.04264
7	11.62	2.00	0.03568	1.13	0.05113	0.05113
8	13.46	2.00	0.03474	1.13	0.05963	0.05963
9	15.23	2.00	0.03424	1.11	0.06818	0.06818
10	16.89	2.00	0.03373	1.09	0.07667	0.07667
11	18.65	2.00	0.03298	1.07	0.08522	0.08522
12	20.55	2.00	0.03235	1.04	0.09372	0.09372
13	22.43	2.00	0.03197	1.02	0.1022	0.1022
14	24.26	2.00	0.03166	1.01	0.1108	0.1108
15	26.03	2.00	0.03147	0.995	0.1193	0.1193
16	27.84	2.00	0.03121	0.994	0.1278	0.1278
17	29.67	2.00	0.03084	0.988	0.1363	0.1363
18	31.39	2.00	0.03065	0.987	0.1448	0.1448
19	33.16	2.00	0.03052	0.980	0.1533	0.1533
20	34.98	2.00	0.03052	0.977	0.1618	0.1618
21	36.91	2.00	0.03040	0.979	0.1704	0.1704
22	38.62	2.00	0.03027	0.983	0.1789	0.1789
23	40.47	2.00	0.03021	0.978	0.1874	0.1874
24	42.19	2.00	0.03021	0.983	0.1959	0.1959
25	44.02	2.00	0.03021	0.990	0.2044	0.2044
26	45.75	2.00	0.03021	0.975	0.2130	0.2130
27	47.70	2.00	0.03021	0.974	0.2215	0.2215
28	49.38	2.00	0.03021	0.987	0.2300	0.2300
29	51.26	2.00	0.03014	0.984	0.2385	0.2385
30	53.03	2.00	0.03008	0.987	0.2470	0.2470
31	54.96	2.00	0.02996	0.999	0.2556	0.2556
32	56.61	2.00	0.03002	1.01	0.2641	0.2641
33	58.36	2.00	0.03002	1.01	0.2726	0.2726
34	60.34	2.00	0.03002	1.02	0.2811	0.2811
35	62.01	2.00	0.03002	1.01	0.2896	0.2896
36	64.10	2.00	0.03002	1.01	0.2982	0.2982
37	65.64	2.00	0.02996	1.01	0.3066	0.3066
38	67.40	2.00	0.02996	1.01	0.3151	0.3151
39	69.36	2.00	0.03002	1.02	0.3237	0.3237
40	71.13	2.00	0.03002	1.02	0.3322	0.3322
41	72.94	2.00	0.03002	1.03	0.3407	0.3407
42	74.15	2.00	0.03002	1.02	0.3466	0.3466

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material: **B-1 BULK @ 11 - 13 feet**

Description of Material: **DARK GRAY LEAN CLAY (FILL) - GLASS NOTED**

Remarks:

Test Method: **ASTM D698 Method A**

TEST RESULTS

Maximum Dry Density	**105.4**	**PCF**
Optimum Water Content	**14.9**	**%**
Percent Fines		**%**

ATTERBERG LIMITS

LL	PL	PI

PROJECT: Green Era Biotechnology Plant

PROJECT NUMBER: A2207015

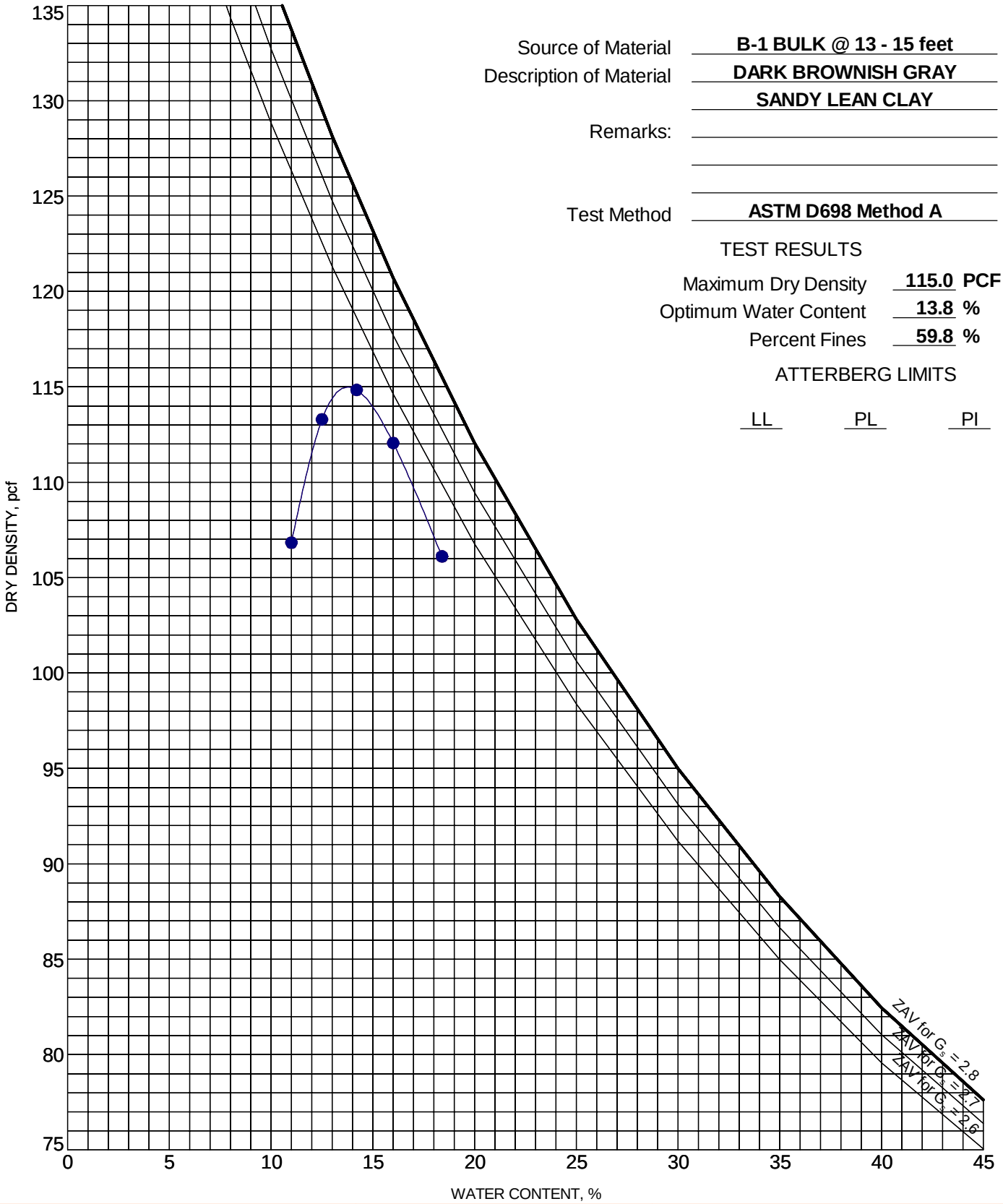
SITE: 650 West 83rd Street
Chicago, IL

Terracon
650 W Lake St, Ste 420
Chicago, IL

CLIENT: Green Era Educational NFP
Chicago, IL

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material	**B-1 BULK @ 13 - 15 feet**
Description of Material	**DARK BROWNISH GRAY SANDY LEAN CLAY**
Remarks:	
Test Method	**ASTM D698 Method A**

TEST RESULTS

Maximum Dry Density	**115.0**	**PCF**
Optimum Water Content	**13.8**	**%**
Percent Fines	**59.8**	**%**

ATTERBERG LIMITS

LL	PL	PI

PROJECT: Green Era Biotechnology Plant

PROJECT NUMBER: A2207015

SITE: 650 West 83rd Street
Chicago, IL

Terracon
650 W Lake St, Ste 420
Chicago, IL

CLIENT: Green Era Educational NFP
Chicago, IL

Laboratory Services Group 192 Exchange Blvd Glendale Heights, Illinois 60139 Ph. (630) 717-4263

HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

TERRACON PROJECT NO.: **A2207015** **10/20/2022**
PROJECT NAME: **Environmental Remediation Services - 650 West 83rd Street**
CLIENT: **Green Era Educational NFP**
LOCATION : **Chicago, IL**

SUMMARY OF TEST RESULTS

BORING NO. B-201-3

SAMPLE ID. N/A

DEPTH: 8.0'-10.0'

CLASSIFICATION Very Dark Brown Sandy Lean Clay (CL)

NOTE: Tube Contents Composed Primarily of Gravel. Section of Lean clay at bottom of Shelby Tube Utilized for the Test.

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	108.3	111.6
WATER CONTENT (%)	20.4	19.0
DIAMETER (cm)	7.220	7.165
LENGTH (cm)	7.040	6.938
B VALUE PARAMETER:	0.97	
HYDRAULIC GRADIENT (MAXIMUM)	23.38	
PERCENT SATURATION	99.8	
HYDRAULIC CONDUCTIVITY k (cm/sec)	1.71E-07	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and an estimated specific gravity.)

Terracon
Laboratory Services Group 192 Exchange Blvd Glendale Heights, Illinois 60139 Ph. (630) 717-4263

HYDRAULIC CONDUCTIVITY DETERMINATION
ASTM D 5084, METHOD C
RISING TAILWATER LEVEL

TERRACON PROJECT NO.: **A2207015** **10/20/2022**
PROJECT NAME: **Environmental Remediation Services - 650 West 83rd Street**
CLIENT: **Green Era Educational NFP**
LOCATION : **Chicago, IL**

SUMMARY OF TEST RESULTS

BORING NO. B-201-3

SAMPLE ID. N/A

DEPTH: 14.0'-16.0'

CLASSIFICATION Brownish gray lean clay trace sand and gravel (CL)

	INITIAL	FINAL
DRY UNIT WEIGHT (pcf)	102.7	104.5
WATER CONTENT (%)	22.7	22.9
DIAMETER (cm)	7.178	7.137
LENGTH (cm)	11.234	11.172
B VALUE PARAMETER:	0.97	
HYDRAULIC GRADIENT (MAXIMUM)	14.65	
PERCENT SATURATION	100.2	
HYDRAULIC CONDUCTIVITY k (cm/sec)	5.07E-08	

SPECIMEN PHOTO

(Percent saturation calculation is based on final measurements and an estimated specific gravity.)

Report Number
F22285-0799
Account Number
99990

a&l greatlakes LABORATORIES
Scientists who don't mind getting dirty.™

3505 Conestoga Dr.
Fort Wayne, IN 46808
260.483.4759
algreatlakes.com

To: TERRACON
192 EXCHANGE BLVD
GLENDALE HEIGHTS, IL 60139

For: A2207015

P.O. Number:

Attn: BRIAN MAYS

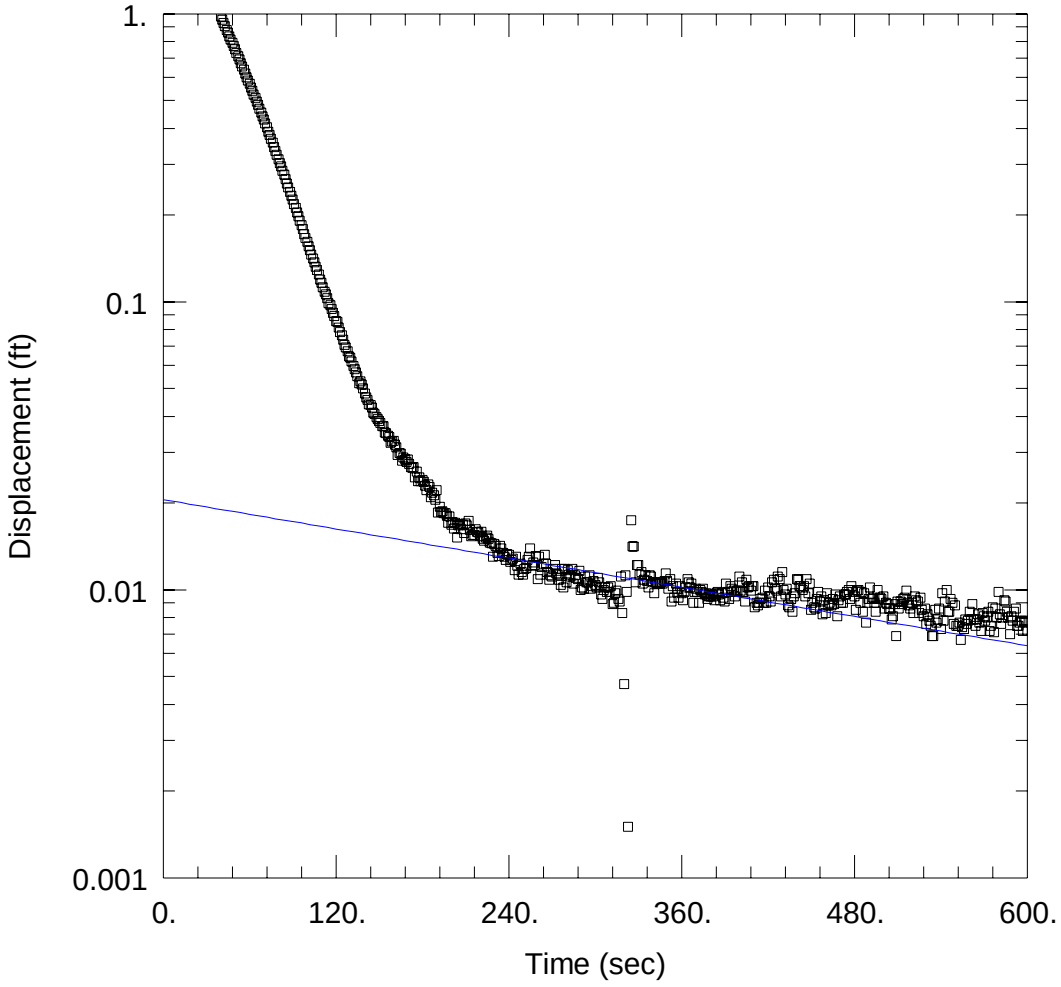
REPORT OF ANALYSIS

Date Received: 10/12/2022
Date Reported: 10/19/2022

Lab Number	Sample ID	Analysis	Result	Unit	Method
13028	B-1 5.0-8.0	Cation Exchange Capacity (NH4-Sat.)	8.71	meq/100g	MSA Part 3 (1996) pp 1220-1221
13029	B-1 13.0-15.0	Cation Exchange Capacity (NH4-Sat.)	5.95	meq/100g	MSA Part 3 (1996) pp 1220-1221

Report reviewed and approved by our professional agronomy staff.

SOILMISC



WELL TEST ANALYSIS

Data Set: C:\...\MW-B1_Green ERA.aqt
Date: 11/21/22 Time: 05:47:32

PROJECT INFORMATION

Company: Terracon
Client: Green ERA
Project: A2207015
Test Well: MW-B1
Test Date: 10/13/2022

AQUIFER DATA

Saturated Thickness: 5.77 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-B1)

Initial Displacement: 2.245 ft
Total Well Penetration Depth: 10. ft
Casing Radius: 0.083 ft
Static Water Column Height: 5.77 ft
Screen Length: 10. ft
Well Radius: 0.33 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.574E-5 cm/sec
y0 = 0.02054 ft

PROJECT INFORMATION

Company: Terracon
Client: Green ERA
Project: A2207015
Test Date: 10/13/2022
Test Well: MW-B1

AQUIFER DATA

Saturated Thickness: 5.77 ft
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-B1

X Location: 0. ft
Y Location: 0. ft

Initial Displacement: 2.245 ft
Static Water Column Height: 5.77 ft
Casing Radius: 0.083 ft
Well Radius: 0.33 ft
Well Skin Radius: 0.33 ft
Screen Length: 10. ft
Total Well Penetration Depth: 10. ft

No. of Observations: 945

Observation Data

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
1.	2.201	474.	0.0096
2.	2.152	475.	0.0098
3.	2.104	476.	0.01
4.	2.053	477.	0.0093
5.	2.016	478.	0.0103
6.	1.98	479.	0.0098
7.	1.944	480.	0.0095
8.	1.91	481.	0.0085
9.	1.875	482.	0.0099
10.	1.842	483.	0.01
11.	1.809	484.	0.009
12.	1.777	485.	0.0098
13.	1.747	486.	0.0084
14.	1.716	487.	0.0097
15.	1.686	488.	0.0077
16.	1.654	489.	0.009
17.	1.626	490.	0.0093
18.	1.591	491.	0.0102
19.	1.564	492.	0.0093
20.	1.53	493.	0.0094

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
21.	1.502	494.	0.009
22.	1.47	495.	0.0084
23.	1.444	496.	0.01
24.	1.396	497.	0.0093
25.	1.362	498.	0.0094
26.	1.333	499.	0.0093
27.	1.304	500.	0.0095
28.	1.275	501.	0.0086
29.	1.243	502.	0.009
30.	1.215	503.	0.0089
31.	1.216	504.	0.0086
32.	1.188	505.	0.0086
33.	1.165	506.	0.0079
34.	1.135	507.	0.0081
35.	1.105	508.	0.0089
36.	1.077	509.	0.0069
37.	1.053	510.	0.0091
38.	1.026	511.	0.0086
39.	1.002	512.	0.0091
40.	0.9771	513.	0.0089
41.	0.9523	514.	0.0093
42.	0.9272	515.	0.0094
43.	0.904	516.	0.0099
44.	0.8799	517.	0.009
45.	0.8588	518.	0.0088
46.	0.8357	519.	0.0086
47.	0.8141	520.	0.009
48.	0.7922	521.	0.0083
49.	0.7721	522.	0.0095
50.	0.751	523.	0.0092
51.	0.7307	524.	0.0091
52.	0.7109	525.	0.0083
53.	0.6926	526.	0.0094
54.	0.6739	527.	0.0085
55.	0.6554	528.	0.0081
56.	0.6398	529.	0.0086
57.	0.6197	530.	0.0076
58.	0.6023	531.	0.0082
59.	0.5858	532.	0.0078
60.	0.5715	533.	0.0075
61.	0.5549	534.	0.0069
62.	0.5399	535.	0.0069
63.	0.5242	536.	0.0085
64.	0.5093	537.	0.0077
65.	0.4954	538.	0.0079
66.	0.4812	539.	0.0086
67.	0.4666	540.	0.0073
68.	0.4537	541.	0.0097
69.	0.4403	542.	0.0078
70.	0.428	543.	0.0091
71.	0.416	544.	0.01
72.	0.4032	545.	0.0084
73.	0.3897	546.	0.0084
74.	0.3784	547.	0.0093
75.	0.3678	548.	0.009

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
76.	0.3564	549.	0.0076
77.	0.3445	550.	0.0088
78.	0.334	551.	0.0075
79.	0.3231	552.	0.0075
80.	0.3124	553.	0.0077
81.	0.3034	554.	0.0067
82.	0.2944	555.	0.0074
83.	0.2848	556.	0.0073
84.	0.2755	557.	0.0079
85.	0.2669	558.	0.0076
86.	0.2575	559.	0.0078
87.	0.2488	560.	0.0084
88.	0.2411	561.	0.0079
89.	0.2329	562.	0.0089
90.	0.2261	563.	0.0079
91.	0.218	564.	0.0075
92.	0.2116	565.	0.0079
93.	0.2039	566.	0.0082
94.	0.1976	567.	0.0077
95.	0.1908	568.	0.0072
96.	0.1847	569.	0.0083
97.	0.1786	570.	0.0081
98.	0.1718	571.	0.0078
99.	0.1667	572.	0.008
100.	0.161	573.	0.0084
101.	0.1556	574.	0.0072
102.	0.1509	575.	0.0075
103.	0.1453	576.	0.0087
104.	0.1411	577.	0.0071
105.	0.1371	578.	0.0086
106.	0.1319	579.	0.008
107.	0.1289	580.	0.0098
108.	0.124	581.	0.0082
109.	0.1193	582.	0.0076
110.	0.1162	583.	0.008
111.	0.1121	584.	0.0092
112.	0.1084	585.	0.0091
113.	0.1058	586.	0.0084
114.	0.1028	587.	0.008
115.	0.0986	588.	0.007
116.	0.097	589.	0.0081
117.	0.0945	590.	0.0078
118.	0.0916	591.	0.0084
119.	0.089	592.	0.0086
120.	0.0856	593.	0.0075
121.	0.0849	594.	0.0075
122.	0.0811	595.	0.0077
123.	0.0783	596.	0.0078
124.	0.0763	597.	0.0072
125.	0.0738	598.	0.0078
126.	0.0709	599.	0.0077
127.	0.0692	600.	0.0072
128.	0.0674	601.	0.0077
129.	0.0647	602.	0.0092
130.	0.064	603.	0.0087

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
131.	0.0619	604.	0.0075
132.	0.0598	605.	0.006
133.	0.0582	606.	0.0065
134.	0.0567	607.	0.001
135.	0.0551	608.	0.0091
136.	0.052	609.	0.0024
137.	0.053	610.	0.0084
138.	0.0515	611.	-0.0007
139.	0.0499	612.	0.0062
140.	0.048	613.	0.0058
141.	0.0466	614.	0.0058
142.	0.0456	615.	0.0091
143.	0.044	616.	0.0079
144.	0.0437	617.	0.0084
145.	0.0428	618.	0.0076
146.	0.0411	619.	0.0088
147.	0.0407	620.	0.008
148.	0.0398	621.	0.008
149.	0.0392	622.	0.0065
150.	0.0385	623.	0.0081
151.	0.038	624.	0.0081
152.	0.0369	625.	0.0078
153.	0.0369	626.	0.0076
154.	0.0352	627.	0.0063
155.	0.0349	628.	0.0066
156.	0.0342	629.	0.0067
157.	0.0339	630.	0.0064
158.	0.0323	631.	0.0081
159.	0.0327	632.	0.007
160.	0.0329	633.	0.0071
161.	0.0319	634.	0.0091
162.	0.0312	635.	0.0081
163.	0.0294	636.	0.0073
164.	0.0298	637.	0.009
165.	0.0297	638.	0.0064
166.	0.028	639.	0.0073
167.	0.0288	640.	0.0071
168.	0.0283	641.	0.0064
169.	0.0278	642.	0.0073
170.	0.0283	643.	0.0077
171.	0.0273	644.	0.0062
172.	0.0266	645.	0.0075
173.	0.0265	646.	0.0077
174.	0.0267	647.	0.0081
175.	0.0246	648.	0.0072
176.	0.0257	649.	0.0073
177.	0.0238	650.	0.0061
178.	0.0246	651.	0.0075
179.	0.0238	652.	0.0065
180.	0.024	653.	0.0068
181.	0.0237	654.	0.0072
182.	0.023	655.	0.0068
183.	0.0222	656.	0.0072
184.	0.0232	657.	0.0073
185.	0.0227	658.	0.0079

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
186.	0.0209	659.	0.0072
187.	0.0217	660.	0.0075
188.	0.0213	661.	0.0062
189.	0.0205	662.	0.0069
190.	0.0222	663.	0.0069
191.	0.0185	664.	0.0072
192.	0.0194	665.	0.0071
193.	0.0186	666.	0.0058
194.	0.0187	667.	0.0067
195.	0.0184	668.	0.0073
196.	0.0184	669.	0.0065
197.	0.0181	670.	0.0072
198.	0.0171	671.	0.0078
199.	0.018	672.	0.0078
200.	0.0168	673.	0.0066
201.	0.0172	674.	0.0073
202.	0.0163	675.	0.0074
203.	0.0171	676.	0.0066
204.	0.0152	677.	0.0073
205.	0.0167	678.	0.0089
206.	0.0169	679.	0.0074
207.	0.0162	680.	0.0072
208.	0.0168	681.	0.0061
209.	0.0157	682.	0.0071
210.	0.017	683.	0.0073
211.	0.0167	684.	0.007
212.	0.0173	685.	0.0074
213.	0.0161	686.	0.0065
214.	0.0153	687.	0.0077
215.	0.0155	688.	0.0074
216.	0.0155	689.	0.0074
217.	0.0162	690.	0.0072
218.	0.0159	691.	0.0063
219.	0.0158	692.	0.0072
220.	0.0153	693.	0.0067
221.	0.0159	694.	0.0075
222.	0.015	695.	0.0085
223.	0.0148	696.	0.0085
224.	0.0152	697.	0.0075
225.	0.0154	698.	0.0071
226.	0.015	699.	0.0078
227.	0.0146	700.	0.0078
228.	0.0145	701.	0.0072
229.	0.013	702.	0.007
230.	0.0144	703.	0.0068
231.	0.0142	704.	0.0074
232.	0.0134	705.	0.0073
233.	0.0131	706.	0.0074
234.	0.0142	707.	0.0069
235.	0.0139	708.	0.0072
236.	0.0134	709.	0.0075
237.	0.013	710.	0.0073
238.	0.0127	711.	0.0075
239.	0.0133	712.	0.0072
240.	0.0132	713.	0.0074

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
241.	0.0125	714.	0.0078
242.	0.0127	715.	0.0075
243.	0.0128	716.	0.0068
244.	0.0117	717.	0.0066
245.	0.013	718.	0.0076
246.	0.0121	719.	0.0068
247.	0.0113	720.	0.0086
248.	0.0123	721.	0.0068
249.	0.0115	722.	0.0068
250.	0.0113	723.	0.0072
251.	0.0118	724.	0.0066
252.	0.0119	725.	0.0065
253.	0.0127	726.	0.0086
254.	0.013	727.	0.0067
255.	0.0139	728.	0.0071
256.	0.0121	729.	0.0091
257.	0.0124	730.	0.0079
258.	0.0122	731.	0.0084
259.	0.0131	732.	0.0078
260.	0.0109	733.	0.0078
261.	0.013	734.	0.0074
262.	0.0113	735.	0.0057
263.	0.012	736.	0.0072
264.	0.0123	737.	0.0076
265.	0.0132	738.	0.0082
266.	0.0123	739.	0.0076
267.	0.0115	740.	0.0064
268.	0.0108	741.	0.0074
269.	0.0112	742.	0.0075
270.	0.0111	743.	0.0063
271.	0.0118	744.	0.0063
272.	0.0122	745.	0.0072
273.	0.0114	746.	0.0079
274.	0.0113	747.	0.0075
275.	0.0108	748.	0.008
276.	0.0104	749.	0.0068
277.	0.0118	750.	0.0072
278.	0.0102	751.	0.0075
279.	0.0118	752.	0.0077
280.	0.0106	753.	0.0072
281.	0.0117	754.	0.007
282.	0.0113	755.	0.007
283.	0.0111	756.	0.0068
284.	0.0118	757.	0.0073
285.	0.0105	758.	0.0067
286.	0.0112	759.	0.0077
287.	0.011	760.	0.0077
288.	0.0109	761.	0.0072
289.	0.0116	762.	0.0069
290.	0.01	763.	0.0074
291.	0.0102	764.	0.0074
292.	0.0101	765.	0.0082
293.	0.0111	766.	0.0068
294.	0.0106	767.	0.007
295.	0.0106	768.	0.0076

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
296.	0.0112	769.	0.0071
297.	0.0101	770.	0.0067
298.	0.0103	771.	0.0071
299.	0.0107	772.	0.0082
300.	0.0104	773.	0.0073
301.	0.0102	774.	0.0078
302.	0.011	775.	0.0073
303.	0.0106	776.	0.0074
304.	0.0096	777.	0.0068
305.	0.0093	778.	0.0065
306.	0.01	779.	0.0073
307.	0.0102	780.	0.0066
308.	0.0098	781.	0.0059
309.	0.0102	782.	0.0074
310.	0.0098	783.	0.0066
311.	0.0103	784.	0.0065
312.	0.0089	785.	0.0065
313.	0.009	786.	0.0069
314.	0.0097	787.	0.0077
315.	0.0099	788.	0.0076
316.	0.0093	789.	0.007
317.	0.0091	790.	0.007
318.	0.0111	791.	0.0059
319.	0.0083	792.	0.0058
320.	0.0047	793.	0.0071
321.	0.0112	794.	0.0077
322.	0.0098	795.	0.0077
323.	0.0015	796.	0.0066
324.	-0.0051	797.	0.0076
325.	0.0174	798.	0.0074
326.	0.0141	799.	0.0079
327.	0.0141	800.	0.0072
328.	0.0106	801.	0.0074
329.	0.0122	802.	0.0061
330.	0.0122	803.	0.0069
331.	0.0113	804.	0.0075
332.	0.0115	805.	0.0058
333.	0.0105	806.	0.0085
334.	0.0108	807.	0.0063
335.	0.0112	808.	0.0061
336.	0.0107	809.	0.0066
337.	0.0102	810.	0.0068
338.	0.0112	811.	0.0071
339.	0.0111	812.	0.0074
340.	0.0106	813.	0.0066
341.	0.0097	814.	0.0073
342.	0.0106	815.	0.007
343.	0.0106	816.	0.007
344.	0.0105	817.	0.0066
345.	0.0105	818.	0.006
346.	0.0106	819.	0.0061
347.	0.0105	820.	0.0066
348.	0.0107	821.	0.0055
349.	0.0114	822.	0.0067
350.	0.0107	823.	0.0081

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
351.	0.0101	824.	0.0069
352.	0.0109	825.	0.0053
353.	0.0091	826.	0.006
354.	0.0103	827.	0.0055
355.	0.0094	828.	0.0055
356.	0.0105	829.	0.0057
357.	0.0098	830.	0.0059
358.	0.0094	831.	0.0067
359.	0.0103	832.	0.0065
360.	0.0097	833.	0.0061
361.	0.0092	834.	0.0058
362.	0.0098	835.	0.005
363.	0.0102	836.	0.0059
364.	0.0109	837.	0.0057
365.	0.0106	838.	0.007
366.	0.0102	839.	0.0075
367.	0.0105	840.	0.0067
368.	0.009	841.	0.0067
369.	0.0098	842.	0.0068
370.	0.0101	843.	0.0064
371.	0.0098	844.	0.0071
372.	0.009	845.	0.0066
373.	0.01	846.	0.0064
374.	0.0098	847.	0.0056
375.	0.0101	848.	0.0063
376.	0.0096	849.	0.0065
377.	0.0097	850.	0.0058
378.	0.0093	851.	0.0066
379.	0.0095	852.	0.0065
380.	0.0095	853.	0.0065
381.	0.0096	854.	0.0058
382.	0.0095	855.	0.0064
383.	0.0092	856.	0.0061
384.	0.0097	857.	0.0046
385.	0.0098	858.	0.0054
386.	0.0096	859.	0.0059
387.	0.0092	860.	0.0065
388.	0.0097	861.	0.0059
389.	0.0094	862.	0.0056
390.	0.0091	863.	0.0064
391.	0.0105	864.	0.0059
392.	0.0098	865.	0.0059
393.	0.0093	866.	0.0062
394.	0.0103	867.	0.0063
395.	0.0101	868.	0.0066
396.	0.0099	869.	0.0063
397.	0.0095	870.	0.0056
398.	0.0098	871.	0.0065
399.	0.0099	872.	0.0064
400.	0.0111	873.	0.006
401.	0.0099	874.	0.0066
402.	0.0106	875.	0.0062
403.	0.0098	876.	0.0067
404.	0.0091	877.	0.0069
405.	0.0108	878.	0.0068

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
406.	0.0102	879.	0.0074
407.	0.0103	880.	0.007
408.	0.0099	881.	0.0066
409.	0.0103	882.	0.0063
410.	0.0103	883.	0.0069
411.	0.0087	884.	0.0063
412.	0.009	885.	0.0071
413.	0.0088	886.	0.0071
414.	0.009	887.	0.0067
415.	0.0093	888.	0.0076
416.	0.0094	889.	0.006
417.	0.009	890.	0.0062
418.	0.0099	891.	0.0064
419.	0.009	892.	0.0062
420.	0.0102	893.	0.0078
421.	0.0095	894.	0.0057
422.	0.0091	895.	0.0072
423.	0.0106	896.	0.0064
424.	0.0108	897.	0.0067
425.	0.0101	898.	0.0065
426.	0.0099	899.	0.0059
427.	0.0111	900.	0.0071
428.	0.0109	901.	0.0073
429.	0.0095	902.	0.0071
430.	0.0115	903.	0.0065
431.	0.01	904.	0.007
432.	0.0096	905.	0.006
433.	0.0101	906.	0.0065
434.	0.0088	907.	0.0068
435.	0.0087	908.	0.0056
436.	0.0093	909.	0.007
437.	0.0084	910.	0.0059
438.	0.0095	911.	0.0068
439.	0.0097	912.	0.0069
440.	0.0109	913.	0.006
441.	0.0108	914.	0.0067
442.	0.0103	915.	0.0066
443.	0.0103	916.	0.0058
444.	0.01	917.	0.0118
445.	0.0103	918.	0.006
446.	0.0095	919.	0.0125
447.	0.0109	920.	0.0088
448.	0.0097	921.	-0.0047
449.	0.0105	922.	-0.0042
450.	0.0085	923.	0.0095
451.	0.009	924.	0.0066
452.	0.0087	925.	0.0077
453.	0.0086	926.	0.0094
454.	0.0093	927.	0.008
455.	0.0098	928.	0.0079
456.	0.0091	929.	0.0081
457.	0.0095	930.	0.0074
458.	0.0082	931.	0.0069
459.	0.0092	932.	0.0078
460.	0.0083	933.	0.0071

Time (sec)	Displacement (ft)	Time (sec)	Displacement (ft)
461.	0.0097	934.	0.0067
462.	0.0088	935.	0.0064
463.	0.009	936.	0.0078
464.	0.0088	937.	0.007
465.	0.0093	938.	0.0069
466.	0.0089	939.	0.0076
467.	0.0096	940.	0.0071
468.	0.0081	941.	0.0072
469.	0.0092	942.	0.0072
470.	0.0095	943.	0.0067
471.	0.009	944.	0.0074
472.	0.009	945.	0.0055
473.	0.0096		

SOLUTION

Slug Test
Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
ln(Re/rw): 2.422

VISUAL ESTIMATION RESULTS

Estimated Parameters

Parameter	Estimate	
K	8.574E-5	cm/sec
y0	0.02054	ft

$T = K*b = 0.01508$ cm²/sec

Supporting Information

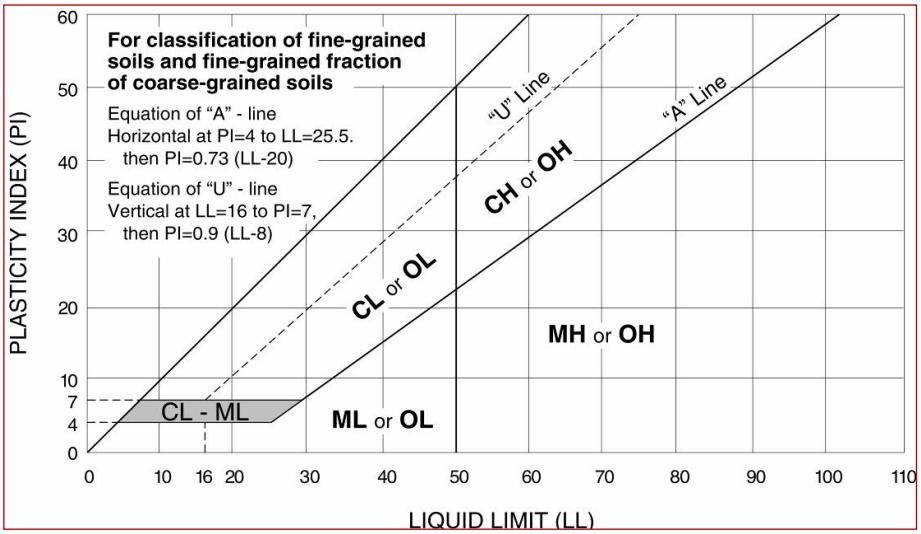
Contents:

Note: All attachments are one page unless noted above.

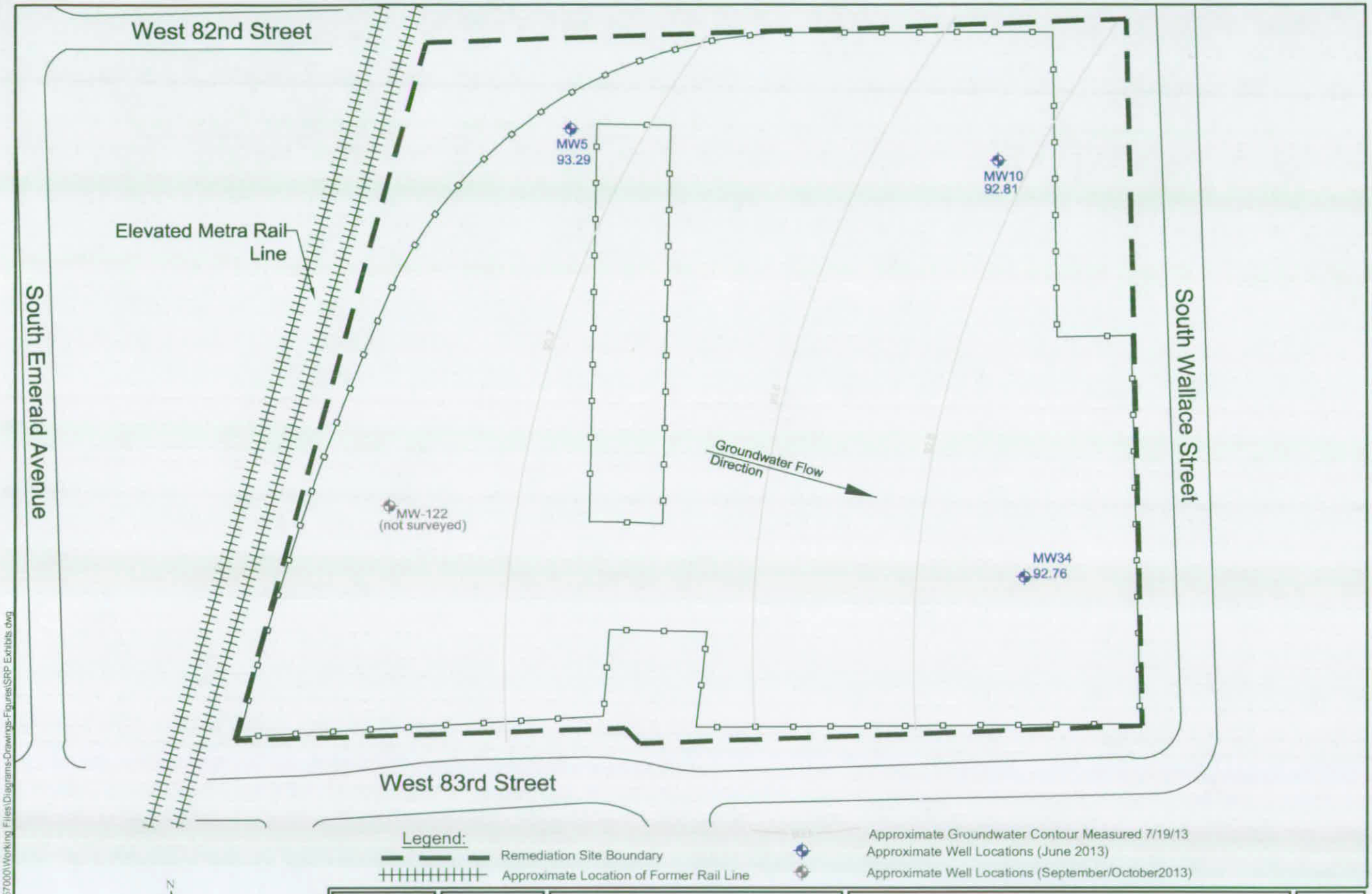
Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



ATTACHMENT 9
POTENTIOMETRIC SURFACE MAP (JULY 19, 2013)



Project Mngr:	RMO
Drawn By:	SDM
Checked By:	RMO
Approved By:	RMO
Project No:	A2157000
Scale:	AS-SHOWN
Revised By:	-
Date:	March 2, 2015

Terracon
Consulting Engineers and Scientists
650 W. LAKE ST., SUITE 420 CHICAGO, ILLINOIS 60661
PH. (312) 575-0014 FAX. (312) 575-0111

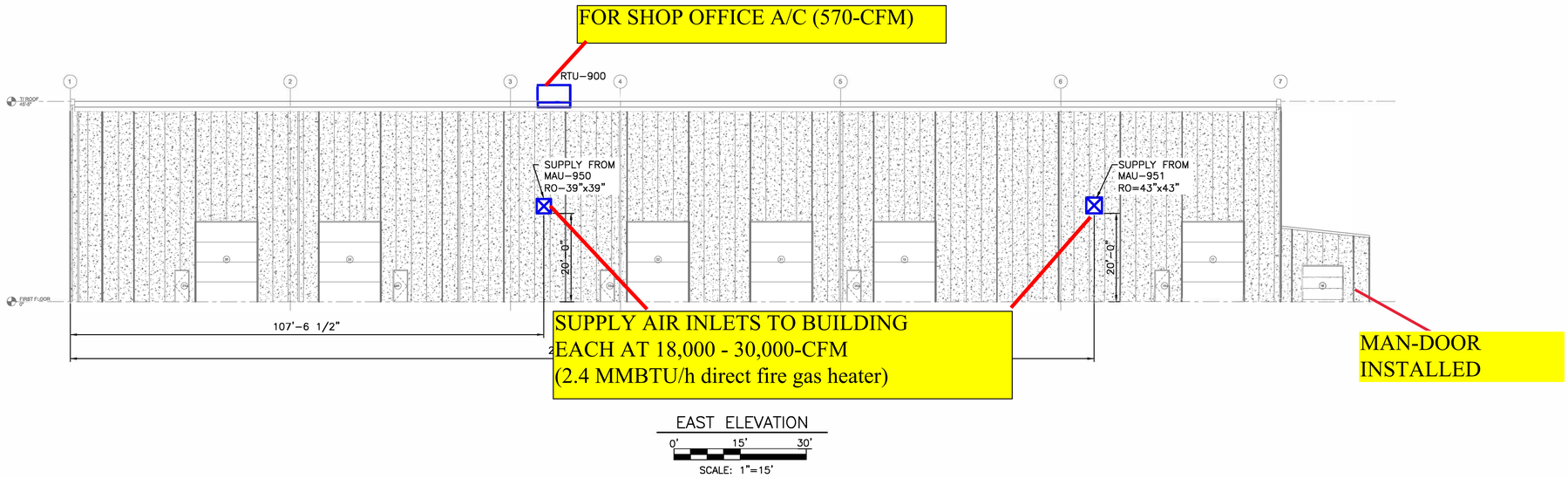
WELL & GROUNDWATER CONTOUR DIAGRAM

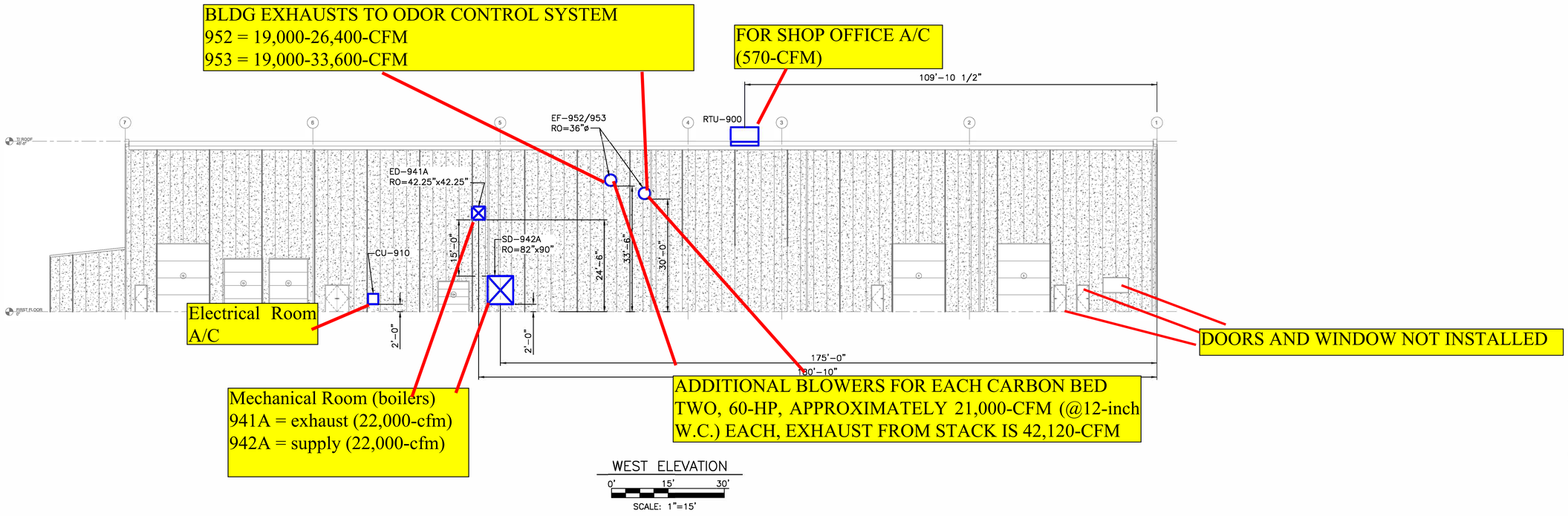
650 WEST 83RD STREET
CHICAGO, COOK COUNTY, ILLINOIS

EXHIBIT
3B

N:\Projects\2015\A2157000\Working Files\Diagrams-Drawings-Figures\SRP Exhibits.dwg

ATTACHMENT 10
INWARD FACIAL VELOCITY CALCULATIONS





ROBERT A. ADAMS REGISTERED NO. 062-054119 STATE OF ILLINOIS PROFESSIONAL ENGINEER 12/20/19 EXP: 11/30/21

REV	DATE	BY	DESCRIPTION
1			
2			
3			
4			
5	10–9–20	RAA	ISSUED FOR CONSTRUCTION

SCALE:	AS SHOWN
DATE:	12–11–19
DRAWN:	JFD
CHECKED:	RFC
APPROVED:	RAA

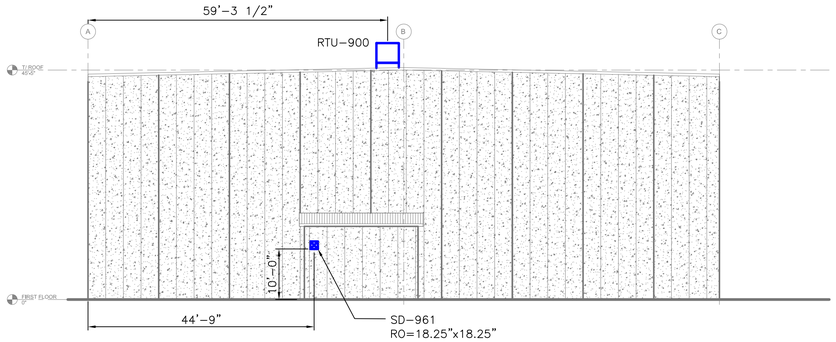
ACEng
www.ac–engineering.com
Adams & Christensen Engineering, Inc.
782 Wexford Ct., Grayslake, IL 60030
Illinois Design Firm #184.006676–0002

CLIENT
GREEN ERA SUSTAINABILITY, LLC
ANAEROBIC DIGESTER PROJECT
650 W. 83RD STREET
CHICAGO, IL. 60620

DESCRIPTION
HVAC ELEVATIONS (1 OF 2)

PROJECT NO: 1019.001

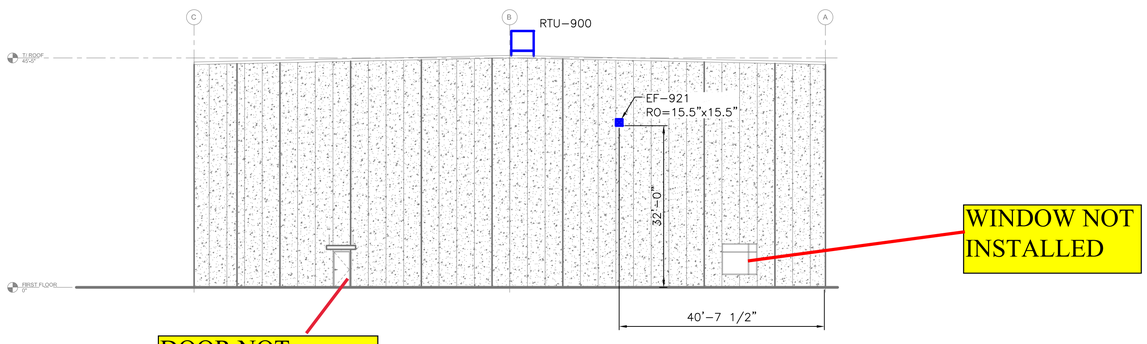
SHEET: M–820



NORTH ELEVATION

0' 15' 30'

SCALE: 1"=15'



SOUTH ELEVATION

0' 15' 30'

SCALE: 1"=15'

ROBERT A. ADAMS
REGISTERED
NO.
062-054119
STATE OF
ILLINOIS
PROFESSIONAL ENGINEER
12/20/19
EXP:
11/30/21

REV	DATE	BY	DESCRIPTION
E			
D			
C			
B			
A	10-9-20	RAA	ISSUED FOR CONSTRUCTION

SCALE: AS SHOWN
DATE: 10-20-18
DRAWN: JFD
CHECKED: RFC
APPROVED: RAA

ACEng
www.ac-engineering.com

Adams & Christensen Engineering, Inc.
782 Wexford Ct., Grayslake, IL 60030
Illinois Design Firm #184.006676-0002

CLIENT

GREEN ERA SUSTAINABILITY, LLC
ANAEROBIC DIGESTER PROJECT
650 W. 83RD STREET
CHICAGO, IL. 60620

DESCRIPTION

HVAC ELEVATIONS (2 OF 2)

PROJECT NO:
1019.001

SHEET:
M-821

Scenario A: One Large Overhead Door Open

Door Type and Number	Opening Size	Opening Area (ft^2)	Status	Assumed Flow Inlet (cfm)	Face Velocity[1] (feet/min)
Large Overhead 1	14' x 18'	252	OPEN	60,000	238.1
Large Overhead 2	14' x 18'	252	CLOSED	0	0
Large Overhead 3	14' x 18'	252	CLOSED	0	0
Large Overhead 3	14' x 18'	252	CLOSED	0	0
Large Overhead 4	14' x 18'	252	CLOSED	0	0
Large Overhead 5	14' x 18'	252	CLOSED	0	0
Large Overhead 6	14' x 18'	252	CLOSED	0	0
Large Overhead 7	14' x 18'	252	CLOSED	0	0
Large Overhead 8	14' x 18'	252	CLOSED	0	0
Large Overhead 9	14' x 18'	252	CLOSED	0	0
Compactor Box Door 1	10' x 14'	140	CLOSED	0	0
Compactor Box Door 2	10' x 14'	140	CLOSED	0	0
Truck Dock/Boiler Door	9' x 10'	90	CLOSED	0	0
Double Man Door	6.67' x 7.17	47.8	CLOSED	0	0
Man Door 1	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 2	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 3	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 4	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 5	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 6	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 7	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 8	3.33' x 7.17'	23.9	CLOSED	0	0

[1]When multiple doors are open at same time, it is assumed that the proportion of the total 60,000-cfm is allocated based on relative opening area.

Scenario B: Two Large Overhead Doors Open

Door Type and Number	Opening Size	Opening Area (ft^2)	Status	Assumed Flow Inlet (cfm)	Face Velocity[1] (feet/min)
Large Overhead 1	14' x 18'	252	OPEN	30,000	119.0
Large Overhead 2	14' x 18'	252	OPEN	30,000	119.0
Large Overhead 3	14' x 18'	252	CLOSED	0	0
Large Overhead 3	14' x 18'	252	CLOSED	0	0
Large Overhead 4	14' x 18'	252	CLOSED	0	0
Large Overhead 5	14' x 18'	252	CLOSED	0	0
Large Overhead 6	14' x 18'	252	CLOSED	0	0
Large Overhead 7	14' x 18'	252	CLOSED	0	0
Large Overhead 8	14' x 18'	252	CLOSED	0	0
Large Overhead 9	14' x 18'	252	CLOSED	0	0
Compactor Box Door 1	10' x 14'	140	CLOSED	0	0
Compactor Box Door 2	10' x 14'	140	CLOSED	0	0
Truck Dock/Boiler Door	9' x 10'	90	CLOSED	0	0
Double Man Door	6.67' x 7.17	47.8	CLOSED	0	0
Man Door 1	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 2	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 3	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 4	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 5	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 6	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 7	3.33' x 7.17'	23.9	CLOSED	0	0
Man Door 8	3.33' x 7.17'	23.9	CLOSED	0	0

[1]When multiple doors are open at same time, it is assumed that the proportion of the total 60,000-cfm is allocated based on relative opening area.

Scenario C: One Large Overhead Door and One Man Door Open

Door Type and Number	Opening Size	Opening Area (ft^2)	Status	Assumed Flow Inlet (cfm)	Face Velocity[1] (feet/min)
Large Overhead 1	14' x 18'	252	OPEN	54,807	217.5
Large Overhead 2	14' x 18'	252	CLOSED	0	0
Large Overhead 3	14' x 18'	252	CLOSED	0	0
Large Overhead 3	14' x 18'	252	CLOSED	0	0
Large Overhead 4	14' x 18'	252	CLOSED	0	0
Large Overhead 5	14' x 18'	252	CLOSED	0	0
Large Overhead 6	14' x 18'	252	CLOSED	0	0
Large Overhead 7	14' x 18'	252	CLOSED	0	0
Large Overhead 8	14' x 18'	252	CLOSED	0	0
Large Overhead 9	14' x 18'	252	CLOSED	0	0
Compactor Box Door 1	10' x 14'	140	CLOSED	0	0
Compactor Box Door 2	10' x 14'	140	CLOSED	0	0
Truck Dock/Boiler Door	9' x 10'	90	CLOSED	0	0
Double Man Door	6.67' x 7.17	47.8	CLOSED	0	0
Man Door 1	3.33' x 7.17'	23.9	CLOSED	5,193	217.5
Man Door 2	3.33' x 7.17'		CLOSED	0	0
Man Door 3	3.33' x 7.17'		CLOSED	0	0
Man Door 4	3.33' x 7.17'		CLOSED	0	0
Man Door 5	3.33' x 7.17'		CLOSED	0	0
Man Door 6	3.33' x 7.17'		CLOSED	0	0
Man Door 7	3.33' x 7.17'		CLOSED	0	0
Man Door 8	3.33' x 7.17'		CLOSED	0	0

[1]When multiple doors are open at same time, it is assumed that the proportion of the total 60,000-cfm is allocated based on relative opening area.

Scenario D: Two Large Overhead Doors and One Man Door Open

Door Type and Number	Opening Size	Opening Area (ft^2)	Status	Assumed Flow Inlet (cfm)	Face Velocity[1] (feet/min)
Large Overhead 1	14' x 18'	252	OPEN	22,639	89.8
Large Overhead 2	14' x 18'	252	OPEN	22,639	89.8
Large Overhead 3	14' x 18'	252	CLOSED	0	0.0
Large Overhead 3	14' x 18'	252	CLOSED	0	0.0
Large Overhead 4	14' x 18'	252	CLOSED	0	0.0
Large Overhead 5	14' x 18'	252	CLOSED	0	0.0
Large Overhead 6	14' x 18'	252	CLOSED	0	0.0
Large Overhead 7	14' x 18'	252	CLOSED	0	0.0
Large Overhead 8	14' x 18'	252	CLOSED	0	0.0
Large Overhead 9	14' x 18'	252	CLOSED	0	0.0
Compactor Box Door 1	10' x 14'	140	OPEN	12,577	89.8
Compactor Box Door 2	10' x 14'	140	CLOSED	0	0.0
Truck Dock/Boiler Door	9' x 10'	90	CLOSED	0	0.0
Double Man Door	6.67' x 7.17	47.8	CLOSED	0	0.0
Man Door 1	3.33' x 7.17'	23.9	OPEN	2,145	89.8
Man Door 2	3.33' x 7.17'	23.9	CLOSED	0	0.0
Man Door 3	3.33' x 7.17'	23.9	CLOSED	0	0.0
Man Door 4	3.33' x 7.17'	23.9	CLOSED	0	0.0
Man Door 5	3.33' x 7.17'	23.9	CLOSED	0	0.0
Man Door 6	3.33' x 7.17'	23.9	CLOSED	0	0.0
Man Door 7	3.33' x 7.17'	23.9	CLOSED	0	0.0
Man Door 8	3.33' x 7.17'	23.9	CLOSED	0	0.0

[1]When multiple doors are open at same time, it is assumed that the proportion of the total 60,000-cfm is allocated based on relative opening area.

Scenario E: All Doors Open

Door Type and Number	Opening Size	Opening Area (ft^2)	Status	Assumed Flow Inlet (cfm)	Face Velocity[1] (feet/min)
Large Overhead 1	14' x 18'	252	OPEN	4,832	19.2
Large Overhead 2	14' x 18'	252	OPEN	4,832	19.2
Large Overhead 3	14' x 18'	252	OPEN	4,832	19.2
Large Overhead 3	14' x 18'	252	OPEN	4,832	19.2
Large Overhead 4	14' x 18'	252	OPEN	4,832	19.2
Large Overhead 5	14' x 18'	252	OPEN	4,832	19.2
Large Overhead 6	14' x 18'	252	OPEN	4,832	19.2
Large Overhead 7	14' x 18'	252	OPEN	4,832	19.2
Large Overhead 8	14' x 18'	252	OPEN	4,832	19.2
Large Overhead 9	14' x 18'	252	OPEN	4,832	19.2
Compactor Box Door 1	10' x 14'	140	OPEN	2,685	19.2
Compactor Box Door 2	10' x 14'	140	OPEN	2,685	19.2
Truck Dock/Boiler Door	9' x 10'	90	OPEN	1,726	19.2
Double Man Door	6.67' x 7.17	47.8	OPEN	917	19.2
Man Door 1	3.33' x 7.17'	23.9	OPEN	458	19.2
Man Door 2	3.33' x 7.17'	23.9	OPEN	458	19.2
Man Door 3	3.33' x 7.17'	23.9	OPEN	458	19.2
Man Door 4	3.33' x 7.17'	23.9	OPEN	458	19.2
Man Door 5	3.33' x 7.17'	23.9	OPEN	458	19.2
Man Door 6	3.33' x 7.17'	23.9	OPEN	458	19.2
Man Door 7	3.33' x 7.17'	23.9	OPEN	458	19.2
Man Door 8	3.33' x 7.17'	23.9	OPEN	458	19.2

[1]When multiple doors are open at same time, it is assumed that the proportion of the total 60,000-cfm is allocated based on relative opening area.

ATTACHMENT 11
LABORATORY ANALYTICAL REPORT (GROUNDWATER SAMPLING)

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditations: IEPA ELAP 100445; ORELAP IL300001; AIHA-LAP, LLC 101160; NVLAP LabCode 101202-0

November 02, 2022

DAI Environmental
27834 N. Irma Lee Circle
Lake Forest, IL 60045
Telephone: (847) 573-8900
Fax: (847) 573-8953

Analytical Report for STAT Work Order: 22100889 Revision 0

RE: 7741, Green Era, Chicago, IL.

Dear DAI Environmental:

STAT Analysis received 1 sample for the referenced project on 10/26/2022 11:44:00 AM. The analytical results are presented in the following report.

All analyses were performed in accordance with the requirements of 35 IAC Part 186 / NELAP standards. Analyses were performed in accordance with methods as referenced on the analytical report. Those analytical results expressed on a dry weight basis are also noted on the analytical report.

All analyses were performed within established holding time criteria, and all Quality Control criteria met EPA or laboratory specifications except when noted in the Case Narrative or Analytical Report. If required, an estimate of uncertainty for the analyses can be provided. A listing of accredited methods/parameters can also be provided.

Thank you for the opportunity to serve you and I look forward to working with you in the future. If you have any questions regarding the enclosed materials, please contact me at (312) 733-0551.

Sincerely,

Justice Kwateng
Project Manager

Client: DAI Environmental
Project: 7741, Green Era, Chicago, IL.
Work Order: 22100889 Revision 0

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Date Received
22100889-001A	MW-201-3		10/26/2022 10:45:00 AM	10/26/2022
22100889-001B	MW-201-3		10/26/2022 10:45:00 AM	10/26/2022

STAT Analysis Corporation

Date: *November 02, 2022*

CLIENT:	DAI Environmental
Project:	7741, Green Era, Chicago, IL.
Work Order:	22100889 Revision 0

CASE NARRATIVE

BOD, COD and Total Kjeldahl Nitrogen analysis was subcontracted to Environmental Monitoring and Technologies, Inc., IL NELAP 100256.

STAT Analysis Corporation
2242 West Harrison St., Suite 200, Chicago, IL 60612-3766
Tel: (312) 733-0551 Fax: (312) 733-2386 STATinfo@STATAnalysis.com
Accreditations:IEPA ELAP 100445;ORELAP IL300001;AIHA-LAP, LLC 101160;NVLAP LabCode 101202-0

Date Reported: November 02, 2022
Date Printed: November 02, 2022

ANALYTICAL RESULTS

Client: DAI Environmental
Work Order: 22100889 Revision 0
Project: 7741, Green Era, Chicago, IL.
Lab ID: 22100889-001

Client Sample ID: MW-201-3
Collection Date: 10/26/2022 10:45:00 AM
Matrix: Aqueous

Analyses	Result	RL	Qualifier	Units	DF	Date Analyzed
Chemical Oxygen Demand	**E410.4**			Prep Date: **11/1/2022**		Analyst: **SUB**
Chemical Oxygen Demand	49.8	15.0		mg/L	1	11/1/2022
BOD, 5 Day, 20°C	**SM5210B**			Prep Date: **10/27/2022**		Analyst: **SUB**
Biochemical Oxygen Demand	ND	15		mg/L	1	11/1/2022
pH	**SM4500-H+ B**			Prep Date: **10/26/2022**		Analyst: **BAS**
pH	7.44		HT	pH Units	1	10/26/2022
Total Kjeldahl Nitrogen	**SM4500-NORGB / SM4500-N**			Prep Date: **10/28/2022**		Analyst: **SUB**
Total Kjeldahl Nitrogen	5.94	3.11		mg/L	1	10/28/2022

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
HT - Sample received past holding time
* - Non-accredited parameter
RL - Reporting / Quantitation Limit for the analysis
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
H - Holding time exceeded

STAT Analysis

2242 W. Harrison Suite 200, Chicago, Illinois 60612 Phone: (312) 733-0551 Fax: (312) 733-2386
e-mail address: STATinfo@STATAnalysis.com

CHAIN OF CUSTODY RECORD

Nº: 937492 **Page :** 1 of 1

Company: DAI Environmental
Project Number: 7741 Client Tracking No.:
Project Name: Green Era
Project Location: Chicago, IL
Sampler(s): Marcus Griesheimer
Report To: Rick Vamos Phone: 847-573-8900
Fax:
QC Level: 1 ___ 2 ___ 3 ___ 4 ___ e-mail: vamos@daienv.com

Quote No.:
P.O. No.:
Turn Around Time (Days): STD
1 2 3 4 (5 - 7) 10
Results Needed:
/ / am/pm

Client Sample Number/Description:	Date Taken	Time Taken	Matrix	Comp.	Grab	Preserv.	No. of Containers	Nitrogen as total Kjeldahl	PH	BOD	COD	Additional Information:	Lab No.:
MW-201-3	10/26/22	10:45	GW		X		2	X	X	X	X		001

Relinquished by: (Signature) Marcus Griesheimer Date/Time: 10/26/22 11:44
Received by: (Signature) Date/Time: 10/26/22 11:44
Relinquished by: (Signature) Date/Time:
Received by: (Signature) Date/Time:
Relinquished by: (Signature) Date/Time:
Received by: (Signature) Date/Time:

Comments:

Laboratory Work Order No.: 22100889

Received on Ice: Yes ☑ No ☐

Temperature: On Ice °C

Preservation Code: A = None B = HNO_3 C = NaOH
D = H_2SO_4 E = HCl F = 5035/EnCore G = Other

STAT Analysis Corporation

Sample Receipt Checklist

Client Name DAI | Date and Time Received: 10/26/2022 11:44:00 AM

Work Order Number 22100889 | Received by: MM

Checklist completed by: mm (Signature) 10/26/22 (Date) | Reviewed by: JOR (Initials) 10/26/22 (Date)

Matrix: | Carrier name: Client Delivered

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels/containers?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☐	No ☑	
Container or Temp Blank temperature in compliance?	Yes ☑	No ☐	Temperature On Ice °C
Water - VOA vials have zero headspace?	No VOA vials submitted ☐	Yes ☐	No ☐
Water - Samples pH checked?	Yes ☑	No ☐	Checked by: MM
Water - Samples properly preserved?	Yes ☑	No ☐	pH Adjusted? no

Any No response must be detailed in the comments section below.

Comments: Client sample was received past hold time for pH analysis of water.

Client / Person contacted: _____ Date contacted: _____ Contacted by: _____

Response: _____

ATTACHMENT 12
SECONDARY CONTAINMENT CALCULATIONS

DEPARTMENT OF BUILDINGS

CITY OF CHICAGO

DATE: 2/13/2023

TO: Patrick Maloney, PE, Assistant Chief Engineer

FROM: Andrew Billing, PE, Lead Stormwater Reviewer

SUBJECT: Approval of Design Plans, dated: **1/30/2023**

Project Name: **Green Era Digester Plan Amendment-Secondary Containment**
Project Address: **650 W 83rd St**
DOB Permit Number:
Designer/Developer: **Terra Engineering**

☒ **Plan Approval.** The following size(s) of drain connection(s) to the main sewer(s) is/are acceptable for the subject property. Please check the plans for other permit requirements inside private property including covenants for joint maintenance.

☐ **Conditional Plan Approval.** The following size(s) of drain connection(s) to the main sewer(s) is/are acceptable for the subject property. However, the attached comments/mark-ups as noted **must** be incorporated into the final plans. Please verify that the plans have been revised as noted and check other permit requirements inside private property including covenants for joint maintenance.

Connection size and location:

No new connections.

Restrictor size and catch basin number and location:

No new restrictors; Backflow preventers to be installed on CB14A & CB8

Rate Control BMPs:

Total allowable operating volume of 80,483 cubic feet (602,057 gallons) is provided during a spill event.

Volume Control BMPs:

Not applicable for Secondary Containment.

Plan modifications described below (or shown on attached sheets) are required on the following sheet numbers:

Sheet(s) _____ _____

_____

Notes: _____

_____

_____

Stormwater Management Plan Review Fees:

The following stormwater review fee has been paid prior to this stormwater approval. (See Stormwater Ordinance, Article 11-18-080, for review fees.)

☐	$1,000.00	for regulated developments < 50,000 sq. ft.
☐	$3,000.00	for regulated developments >= 50,000 sq. ft.
☐	$1,500.00	for a variance request < 50,000 sq. ft.
☐	$4,500.00	for a variance request >= 50,000 sq. ft.
☐	$350.00	for a plan amendment submitted within one year of plan approval
☒	$500.00	for a plan amendment submitted over one year after plan approval
☐	No Fee Required, reason:	

Departmental requirements are subject to change. This record of approval is **valid for one year** from the date of issue indicated above. It is the designer's/developer's responsibility to field check the size, location, and invert elevation of existing sewers and other city-owned or private utilities prior to the start of construction.

Please be advised: this document is a stormwater design approval; **this is not a permit** to perform the work shown on the plans. The contractor must obtain all required permits prior to beginning construction including, but not limited to, the sewer permit, street opening permit, driveway permit, etc.

Originated by: **Benjamin Stammis, PE, V3 Companies, Stormwater Consultant** BTS
cc-Designer: **John Helfrich, PE, Terra Engineering**

PD Approval

TERRA ENGINEERING LTD.

DATE: June 14. 2022
Revised January 30, 2023

TO: Ben Stammis, PE
City of Chicago – Department of Buildings

FROM: John C. Helfrich, PE, ENV SP

SUBJECT: Green Era Digester – Secondary Containment
650 W. 83rd Street

TERRA Engineering (TERRA) has completed the following assessment for Green Era Sustainability in support of secondary containment measures for the Green Era Digester project located at the northwest corner of W. 83rd Street and N. Wallace Street in Chicago, Illinois. The purpose of this assessment is to determine the capacity of the site to contain a digester tank spill event to establish the maximum allowable operating volume of the digester tank.

Current Site Conditions

The project site is a former open field that has been redeveloped to include an industrial building, digester tanks, paved asphalt parking lots and drives, and a detention pond. The digester tank is situated in the northwest corner of the site, immediately north of the building, within a gravel equipment yard and surrounded by an asphalt drive with a curb and gutter system. The site drainage consists of a system of catch basins and storm sewers that convey runoff to an at-grade detention basin located at the southeast corner of the site, which ultimately discharges to the City's 45-inch combined sewer in 83rd Street.

The detention basin was originally designed to have a 100-yr volume of approximately 88,000 cubic feet at a high-water line (HWL) at 13.00 Chicago City Datum (CCD). An as-built survey was provided by DLZ Industrial Survey, Inc. on May 3, 2022, and TERRA used the current topography to determine the as-built detention provided at 13.00 CCD to be 87,787 cubic feet. Site volumes throughout this assessment were determined using 3D TIN surfaces created in AutoCAD Civil 3D 2020.

Interim Containment Conditions

Green Era is currently establishing an allowable operating volume for the digester with the Chicago Department of Public Health (CDPH). Per coordination with CDPH, this interim operating volume must not exceed the containment capacity that currently exists on-site. In the event of a tank failure, the digestate is anticipated to initially flow from the tank, through the on-site drainage system, and into the detention basin where a new plug valve will be operated to keep digestate from flowing into the City's sewer system. From there, on-site personnel will mobilize high-capacity pumps to remove digestate from the detention basin and pump into the building's basement for storage until it can be hauled to an approved location. The plug valve will then be reopened, and the detention basin will resume function as originally designed.

The above emergency response plan will dictate the allowable interim operating volume which must not exceed the lesser volume between the basement + spare tanks or the detention basin + sewer system. Approximate storage volumes in the basement and spare tanks have been provided by DAI Environmental, Inc. and included in the attached calculations. Calculations have also been provided showing the as-built volume of the detention basin and storage volume in the storm sewer system.

Stormwater Management

In addition to providing containment for the digestate volume, it is recommended to include provisions for a "first flush" rain event occurring at the same time as a spill. The City's Stormwater Spreadsheet Tool R4.1 02-15-2018 was manipulated to import the rainfall intensities for the Bulletin 70, 2-yr rain event ("first flush") and Tab 1.0 Rate Control was used to determine runoff volumes for different

scenarios. Per coordination with Green Era and their operator, we understand that a pump rate of 3,750 GPM will be provided by on-site pump(s) able to be immediately mobilized to the detention basin in the event of a spill.

Scenario 1: A 2-yr rain event occurs while the basin is full of digestate and being pumped into the basement.
Release Rate = 8.355 cfs (3,750 GPM)
Peak Volume = 10,611 cf (79,373 gal)

Scenario 2: A 2-yr rain event occurs while the basin is empty, but the plug valve is closed.
Release Rate = 0.000 cfs
Peak Volume = 86,892 cf (649,999 gal)

Scenario 1 determines the stormwater volume that should be accounted for in the containment capacity of the site and Scenario 2 shows that, even with the outlet of the detention basin plugged, the basin has adequate capacity to hold the 2-yr ("first flush") rain event.

Interim Site Mitigation

TERRA recommends installing a plug valve at the downstream outlet pipe of the basin that can be operated in case of a spill. Backflow preventors will be installed on incoming storm sewers to the basin that do not drain the area around the digester tanks (notably the northeast and west storm outfalls). Minor grading modifications are planned to ensure the detention basin does not overtop to the public right-of-way at the 100-yr HWL of 13.00 CCD. See attached exhibits for anticipated flood areas. A temporary barrier along the north property line is also proposed to ensure that, in the event of a catastrophic failure, digestate does not overtop the existing curb and flow to the north parcel.

All proposed site modifications will be reviewed with the City and permitted, as necessary. Any site modification will not impact the existing drainage patterns and/or the amount of rate control and volume control provided by the current stormwater permit.

Interim Volume Summary

	On-Site Containment Volume	Volume (gal)	Volume (cf)
1	Basin Volume @ 13.00 CCD	656,692 gal	87,787 cf
2	Sewer Pipes & Structure Volume	24,738 gal	3,307 cf
3	**Total Containment Volume**	**681,430 gal**	**91,094 cf**
	Building Containment Volume		
4	Volume in Basement	647,035 gal	86,496 cf
5	Volume in Spare Tanks	65,743 gal	8,789 cf
6	**Total Containment Volume**	**712,778 gal**	**95,285 cf**
	Stormwater Management		
7	2-yr Volume	79,373 gal	10,611 cf
8	**Total Allowable Operating Volume (3-7)**	**602,057 gal**	**80,483 cf**

Future Containment Conditions

Green Era is currently planning improvements to the adjacent parcel north of the digester tank. The conceptual plan includes the construction of an overland spillway, minor storm sewer modifications, and an excavated storage area that would provide containment for the full volume capacity of the digester tank in addition to all requirements of the CDPH rules regarding Landfills, Liquid Waste Handling Facilities and Transfer Stations. All proposed improvements beyond what is included within this memo will be submitted to DOB for further review and approval.

Conclusion

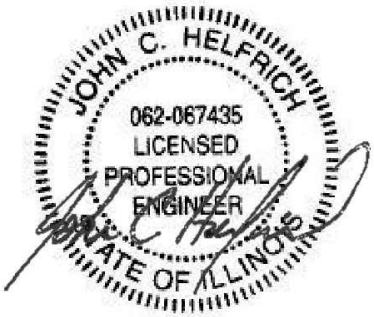
In the event of a digestate spill, interim secondary containment will be provided in the existing on-site drainage system and then immediately pumped into the building's basement and spare tanks for storage before ultimately being disposed of. To achieve the necessary site containment capacity, plug valves and backflow preventors will be required to ensure the spill does not overflow to the 83rd Street right of way. With the proposed modifications within this memo, the operating volume of the facility should be reduced so the containment volume required does not exceed the containment volume provided, until further site modifications can be made.

Should you have any questions or require any further information, please do not hesitate to reach out via email at jhelfrich@terraengineering.com or via phone at 312-467-0123.

Sincerely,
TERRA Engineering, Ltd.

John C. Helfrich, PE, ENV SP
Senior Project Manager

cc: Jason Feldman, Green Era Sustainability
Rick Vamos, DAI Environmental, Inc.



EXP: 11/30/23

Scale: 1 inch = 40 feet

VOLUME SUMMARY

	GALLONS	CUBIC FEET
ON-SITE CONTAINMENT VOLUME		
BASIN VOLUME @ 13.00 CCD (AS-BUILT HWL)	656,692	87,787
SEWER PIPES & STRUCTURE VOLUME	24,738	3,307
TOTAL CONTAINMENT VOLUME	**681,430**	**91,094**
BUILDING CONTAINMENT VOLUME		
AVAILABLE VOLUME IN BASEMENT	647,035	86,496
AVAILABLE VOLUME IN SPARE TANKS	65,743	8,789
TOTAL CONTAINMENT VOLUME	**712,778**	**95,285**
TOTAL ALLOWABLE OPERATION VOLUME	**681,430**	**91,094**

BASIN VOLUME TABLE

Contour Elevation (ft)	Contour Area (sq. ft)	Conic Incremental Volume (cu. ft)	Conic Cumulative Volume (cu. ft)
8.81	0	NA	0
9.00	170	11	11
10.00	20,161	7,394	7,405
11.00	25,323	22,693	30,098
12.00	28,832	27,058	57,156
13.00	32,465	30,630	87,787

TERRA ENGINEERING LTD.
225 W Ohio Street - Suite 400; Chicago, IL 60654
(T) 312-467-0123 | (F) 312-467-0220

SPILL VOLUME EXHIBIT - 13.00 CCD
GREEN ERA DIGESTER
01/05/2023 MBB

City of Chicago
Department of Water Management **1/22/2020**

Name of Project: Green Era Digester
Address: 650 W. 83rd Street
A/E of Record: Terra Engineering, Ltd.
Note: Proposed Areas contain both Phase 1 and Phase 2 of the project.

1.0 Rate Control (Sheet 1 of 2)

Step 1: **Runoff Calculation**

		Proposed Area (sq. ft.)	C-Value 100-Year	Storage Volume (cu. ft.)
Pervious Land	Lawns - Sandy soil, flat, 0% to 2%		0.18	
	Lawns - Sandy soil, avg, 2% to 7%		0.27	
	Lawns - Sandy soil, steep, >7%		0.36	
	Lawns - Heavy soil, flat, 0% to 2%		0.30	
	Lawns - Heavy soil, avg, 2% to 7%	154,709	0.42	
	Lawns - Heavy soil, steep, >7%		0.47	
	Woodlands, flat, 2%		0.39	
	Native Vegetation with prepared soils		0.10	
	Dry bottom basins to HWL	32,824	0.75	
	Wetland		0.80	
	Green Roof		0.50	
Impervious Land	Gravel	49,666	0.70	
	Pavement	104,329	0.95	
	Roofs (conventional)	46,374	0.95	
Food Digester with	Total	1	0.95	
	Wet bottom basins to HWL		1.00	
BMP areas	BMPs providing storage that WILL COUNT toward detention storage (from Worksheet 1.2)	0	1.00	
	BMPs providing volume control storage that WILL NOT BE COUNTED toward detention (from Worksheet 1.2)	0	Storage Provided will be used to factor the adjusted C-value in Cell D38	0

Summary	Total pervious area	187,533	sq ft		
	Total impervious area	200,370	sq ft		
	Total BMP area	0	sq ft		
	Total site area including sidewall	387,903	sq ft	8.91	acres
	Total site area excluding sidewall	387,902	sq ft	8.91	acres
	Weighted C- value (non BMP areas)	0.69	unitless		
	Adjusted C-value (accounts for BMPs)	0.00	unitless		
	Notes:	*Make note of any adjustments made for purposes of detention calcs here (such as removal of roof area that will discharge directly to Waters)*			

Step 2: **Allowable Release Rate Assessment**

		Type Yes or No for all that apply	Notes
Question 1:	Does the site drain directly to Waters?	No	
Question 2:	Does the site only include residential land use?	No	
Question 3:	Is the Regulated Development a Lot-to-Lot Buillding (85% or more of site footprint is occupied by buildings)?	No	
Question 4:	Do you plan to use the standard maximum release rate (only available to sites less than 1.75 acres)?	No	Complete Tab 0.0 Release Rate to calculate the allowable release rate for the site unless a 1 cfs/ac release rate to waters will be used.
Question 5:	Is the site more than 75 percent of substantially contiguous at-grade open space that is conducive to ponding of surface waters (Answer "No" if site discharges to waterway or is a service station)?	No	
Question 6:	Does the development involve flow diversions (existing sewer connection to be relocated to a different main) or multiple sewer connections (only available to sites over 1.75 acres)?	No	
Question 7:	Are there widespread contaminated soils on the site, high ground water table, or is this development classified as a lot-to-lot building?	Yes	Oversized detention is allowed to meet volume control requirements. After completing this worksheet, fill out Tab 2.1.9 to design oversized detention.

City of Chicago
Department of Water Mangement

Name of Project: Green Era Digester
Address: 650 W. 83rd Street
A/E of Record: Terra Engineering, Ltd.

1.0 Rate Control (Sheet 2 of 2)

Step 3: **Achieving Rate Control Measures**

Unadjusted Detention Release Rate =	0.000	cfs	Kostner	0.000
Dry Weather Flow Rate = (From dry weather flow worksheet)	0.000	cfs	Waiting for Dry Weather Flow worksheet to be completed	
Infiltration Facility Release Rate (to be added to eligible release rate when computing required storage)	0.000	cfs	No BMPs with infiltration beds entered on BMP Summary Worksheet or soil's infiltration rate is less than 0.5 in/hr	
Release rate for detention storage computations:	**8.355**	cfs		
Required Storage Volume =	10,611	cu ft		

Pump Rate = 3,750 GPM

Detention Storage Calculations
(Based on Bulletin 70 Rainfall Data)

STORM EVENT (5,10,25,50 or 100) = 2

Allowable release rate 8.355 cfs

Storm Duration (minute)	Runoff Coefficient C	Rainfall Intensity (in/hr)	Drainage Area A (acres)	Inflow Rate Q=CIA	Total Storm Vol (cu ft)	Release Rate Qo (cfs)	Storage Rate (Qi-Qo) (cfs)	Storage Volume Rate (Qi-Qo)*t*60 (cu ft)
5	0.69	4.320	8.91	26.53	7,960	8.355	18.18	5,453
10	0.69	4.020	8.91	24.69	14,814	8.355	16.33	9,801
15	0.69	3.280	8.91	20.14	18,130	8.355	11.79	10,611
30	0.69	2.240	8.91	13.76	24,763	8.355	5.40	9,724
60	0.69	1.430	8.91	8.78	31,617	8.355	0.43	1,539
120	0.69	0.895	8.91	5.50	39,577	8.355	-2.86	-20,579
180	0.69	0.647	8.91	3.97	42,893	8.355	-4.38	-47,341
360	0.69	0.380	8.91	2.33	50,411	8.355	-6.02	-130,057
720	0.69	0.220	8.91	1.35	58,370	8.355	-7.00	-302,566
1080	0.69	0.155	8.91	0.95	61,687	8.355	-7.40	-479,717
1440	0.69	0.127	8.91	0.78	67,214	8.355	-7.58	-654,658
2880	0.69	0.069	8.91	0.42	72,963	8.355	-7.93	-1,370,781
4320	0.69	0.049	8.91	0.30	78,490	8.355	-8.05	-2,087,126
7200	0.69	0.033	8.91	0.20	86,892	8.355	-8.15	-3,522,468
14400	0.69	0.000	8.91	0.00	1,824	8.355	-8.35	-7,216,896
							Required Detention Volume (cu ft)	10,611

Note: 1) the calculation assumes that the rising and recessing limb of inflow and outflow hydrograph are vertical

City of Chicago
Department of Water Management **1/22/2020**

Name of Project: Green Era Digester
Address: 650 W. 83rd Street
A/E of Record: Terra Engineering, Ltd.
Note: Proposed Areas contain both Phase 1 and Phase 2 of the project.

1.0 Rate Control (Sheet 1 of 2)

Step 1: **Runoff Calculation**

		Proposed Area (sq. ft.)	C-Value 100-Year	Storage Volume (cu. ft.)
Pervious Land	Lawns - Sandy soil, flat, 0% to 2%		0.18	
	Lawns - Sandy soil, avg, 2% to 7%		0.27	
	Lawns - Sandy soil, steep, >7%		0.36	
	Lawns - Heavy soil, flat, 0% to 2%		0.30	
	Lawns - Heavy soil, avg, 2% to 7%	154,709	0.42	
	Lawns - Heavy soil, steep, >7%		0.47	
	Woodlands, flat, 2%		0.39	
	Native Vegetation with prepared soils		0.10	
	Dry bottom basins to HWL	32,824	0.75	
	Wetland		0.80	
	Green Roof		0.50	
Impervious Land	Gravel	49,666	0.70	
	Pavement	104,329	0.95	
	Roofs (conventional)	46,374	0.95	
Food Digester with	Total	1	0.95	
	Wet bottom basins to HWL		1.00	
BMP areas	BMPs providing storage that WILL COUNT toward detention storage (from Worksheet 1.2)	0	1.00	
	BMPs providing volume control storage that WILL NOT BE COUNTED toward detention (from Worksheet 1.2)	0	Storage Provided will be used to factor the adjusted C-value in Cell D38	0

Summary	Total pervious area	187,533	sq ft		
	Total impervious area	200,370	sq ft		
	Total BMP area	0	sq ft		
	Total site area including sidewall	387,903	sq ft	8.91	acres
	Total site area excluding sidewall	387,902	sq ft	8.91	acres
	Weighted C- value (non BMP areas)	0.69	unitless		
	Adjusted C-value (accounts for BMPs)	0.00	unitless		
	Notes:	*Make note of any adjustments made for purposes of detention calcs here (such as removal of roof area that will discharge directly to Waters)*			

Step 2: **Allowable Release Rate Assessment**

		Type Yes or No for all that apply	Notes
Question 1:	Does the site drain directly to Waters?	No	
Question 2:	Does the site only include residential land use?	No	
Question 3:	Is the Regulated Development a Lot-to-Lot Buillding (85% or more of site footprint is occupied by buildings)?	No	
Question 4:	Do you plan to use the standard maximum release rate (only available to sites less than 1.75 acres)?	No	Complete Tab 0.0 Release Rate to calculate the allowable release rate for the site unless a 1 cfs/ac release rate to waters will be used.
Question 5:	Is the site more than 75 percent of substantially contiguous at-grade open space that is conducive to ponding of surface waters (Answer "No" if site discharges to waterway or is a service station)?	No	
Question 6:	Does the development involve flow diversions (existing sewer connection to be relocated to a different main) or multiple sewer connections (only available to sites over 1.75 acres)?	No	
Question 7:	Are there widespread contaminated soils on the site, high ground water table, or is this development classified as a lot-to-lot building?	Yes	Oversized detention is allowed to meet volume control requirements. After completing this worksheet, fill out Tab 2.1.9 to design oversized detention.

City of Chicago
Department of Water Mangement

Name of Project: Green Era Digester
Address: 650 W. 83rd Street
A/E of Record: Terra Engineering, Ltd.

1.0 Rate Control (Sheet 2 of 2)

Step 3: **Achieving Rate Control Measures**

Unadjusted Detention Release Rate =	0.000	cfs	Kostner	0.000
Dry Weather Flow Rate = (From dry weather flow worksheet)	0.000	cfs	Waiting for Dry Weather Flow worksheet to be completed	
Infiltration Facility Release Rate (to be added to eligible release rate when computing required storage)	0.000	cfs	No BMPs with infiltration beds entered on BMP Summary Worksheet or soil's infiltration rate is less than 0.5 in/hr	
Release rate for detention storage computations:	**0.000**	cfs	Assume plugged condition	
Required Storage Volume =	86,892	cu ft		

Detention Storage Calculations
(Based on Bulletin 70 Rainfall Data)

STORM EVENT (5,10,25,50 or 100) = 2

Allowable release rate 0.000 cfs

Storm Duration (minute)	Runoff Coefficient C	Rainfall Intensity (in/hr)	Drainage Area A (acres)	Inflow Rate Q=CIA	Total Storm Vol (cu ft)	Release Rate Qo (cfs)	Storage Rate (Qi-Qo) (cfs)	Storage Volume Rate (Qi-Qo)*t*60 (cu ft)
5	0.69	4.320	8.91	26.53	7,960	0.000	26.53	7,960
10	0.69	4.020	8.91	24.69	14,814	0.000	24.69	14,814
15	0.69	3.280	8.91	20.14	18,130	0.000	20.14	18,130
30	0.69	2.240	8.91	13.76	24,763	0.000	13.76	24,763
60	0.69	1.430	8.91	8.78	31,617	0.000	8.78	31,617
120	0.69	0.895	8.91	5.50	39,577	0.000	5.50	39,577
180	0.69	0.647	8.91	3.97	42,893	0.000	3.97	42,893
360	0.69	0.380	8.91	2.33	50,411	0.000	2.33	50,411
720	0.69	0.220	8.91	1.35	58,370	0.000	1.35	58,370
1080	0.69	0.155	8.91	0.95	61,687	0.000	0.95	61,687
1440	0.69	0.127	8.91	0.78	67,214	0.000	0.78	67,214
2880	0.69	0.069	8.91	0.42	72,963	0.000	0.42	72,963
4320	0.69	0.049	8.91	0.30	78,490	0.000	0.30	78,490
7200	0.69	0.033	8.91	0.20	86,892	0.000	0.20	86,892
14400	0.69	0.000	8.91	0.00	1,824	0.000	0.00	1,824
							Required Detention Volume (cu ft)	86,892

Note: 1) the calculation assumes that the rising and recessing limb of inflow and outflow hydrograph are vertical

Project: Green Era Secondary Containment
Title Pipe & Structure Storage
Date: 1/5/2023

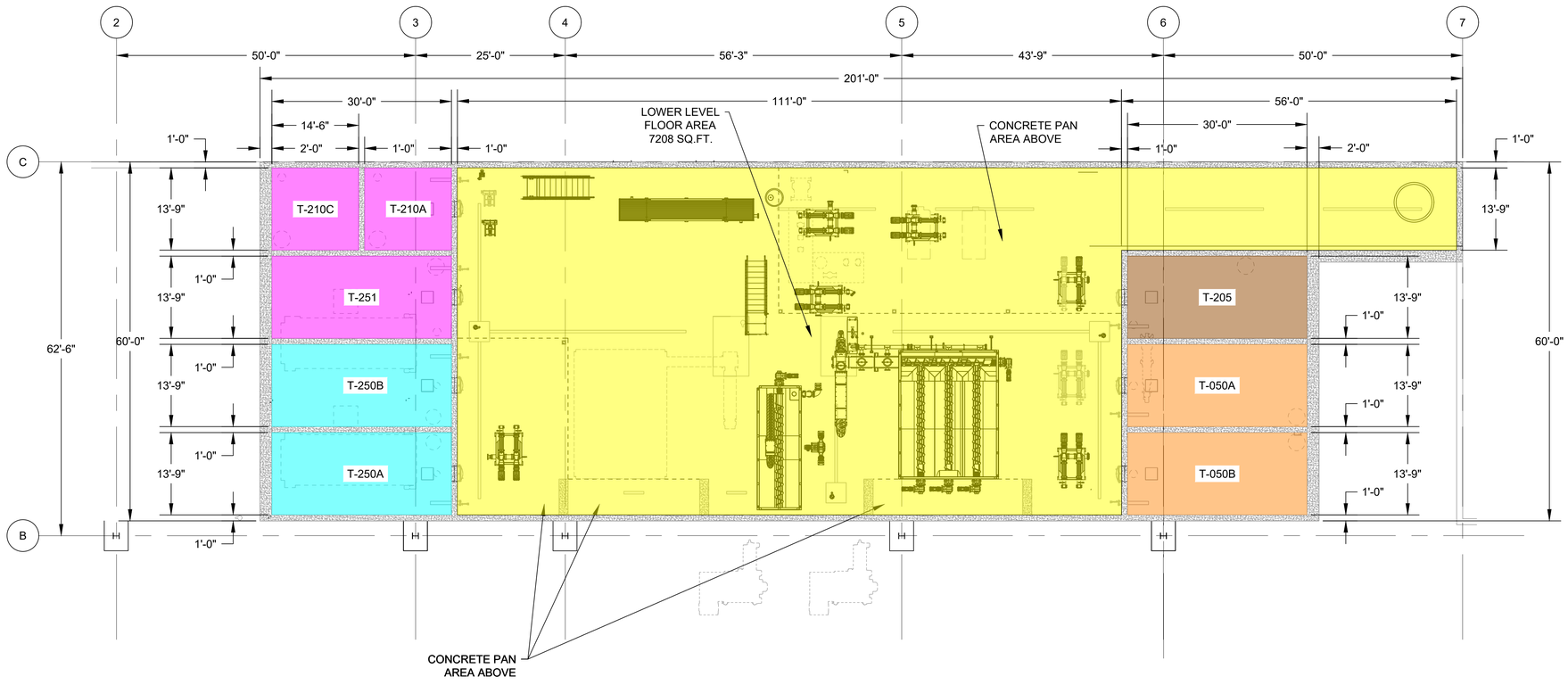
TERRA ENGINEERING LTD.
225 West Ohio Street, 4th Floor
Chicago, Illinois 60610
T:(312)467-0123 F:(312) 467-0220

Calc: MBelongilot
Check: JHelfrich

Stormwater Pipes		
Length (ft)	**Diameter (ft)**	**Volume (CF)**
52	0.5	**10.21**
81	0.67	**28.55**
520	1	**408.33**
319	1.5	**563.61**
164	2	**515.12**
318	2.5	**1,560.68**
Total		**3,086.51**

Stormwater Structures								
Structure Label	**Diameter (ft)**	**RIM (CCD)**	**HWL (CCD)**	**Bottom of Flat Top (RIM - 18")**	**Bottom of Conical Section (RIM-2'-10")**	**Invert**	**Barrel Volume (CF)**	**Total Volume (CF)**
7A	4.0	**16.20**	**13.00**	N/A	13.37	10.07	36.80	39.60
7	4.0	**15.34**	**13.00**	N/A	12.51	10.31	27.59	30.39
6	4.0	**15.34**	**13.00**	N/A	12.51	10.56	24.45	27.25
3A	4.0	**14.71**	**13.00**	N/A	11.88	10.86	12.77	15.57
3	4.0	**13.41**	**13.00**	11.91	N/A	10.91	12.56	15.36
4	4.0	**13.35**	**13.00**	11.85	N/A	11.19	8.29	11.09
2	4.0	**16.81**	**13.00**	N/A	13.98	11.26	21.85	24.65
2	4.0	**15.55**	**13.00**	N/A	12.72	11.50	15.28	18.08
2A	4.0	**16.95**	**13.00**	N/A	14.12	13.40	0.00	2.80
3	4.0	**17.00**	**13.00**	N/A	14.17	10.82	27.38	30.18
6A	4.0	**16.90**	**13.00**	N/A	14.07	13.05	0.00	2.80
6B	4.0	**16.75**	**13.00**	N/A	13.92	13.70	0.00	2.80
Total								**220.58**

Pipe & Structure Volume Provided 3,307 CF



NAME	DESCRIPTION	LENGTH FT	WIDTH FT	DEPTH FT	CAPACITY FT^3	CAPACITY GAL.	SERVICE
	LOWER LEVEL (MAIN AREA)	111	58	12	77,256		-
	LOWER LEVEL (PIPING TUNNEL)	56	13.75	12	9,240		-
	LOWER LEVEL (TOTAL)				86,496	647,035	-
T-050A	LIQUID RECEIVING TANK	30	13.75	10.83	4,469	33,429	FEEDSTOCK
T-050B	LIQUID RECEIVING TANK	30	13.75	10.83	4,469	33,429	FEEDSTOCK
T-205	SCREENED DIGESTATE TANK	30	13.75	10.83	4,469	33,429	DIGESTATE
T-210A	BULK POLYMER/SPARE TANK	14.5	13.75	10.83	2,160	16,157	SPARE
T-210C	BULK POLYMER/SPARE TANK	14.5	13.75	10.83	2,160	16,157	SPARE
T-250A	BELT PRESS FILTRATE TANK	30	13.75	10.83	4,469	33,429	FILTRATE
T-250B	BELT PRESS FILTRATE TANK	30	13.75	10.83	4,469	33,429	FILTRATE
T-251	SPARE TANK	30	13.75	10.83	4,469	33,429	SPARE
					TOTAL	879,921	

TOTAL BASEMENT VOLUME

TOTAL SPARE TANK VOLUME
65,743 GAL (8,789 CF)

DIGESTER BUILDING LOWER LEVEL TANKAGE & BASEMENT VOLUMES

SCALE: 3/32" = 1'-0"

3/32" = 1'-0"

2' 1' 0 2' 4' 6' 8' 12' 16' 24'

NO.	DATE
BY	
REVISION	
NO.	DATE
BY	
REVISION	
NO. 1	DATE 9/1/2022
BY BR	
REVISION REPLACED CHART FLOOR AREA COLUMN WITH LENGTH AND WIDTH COLUMNS	

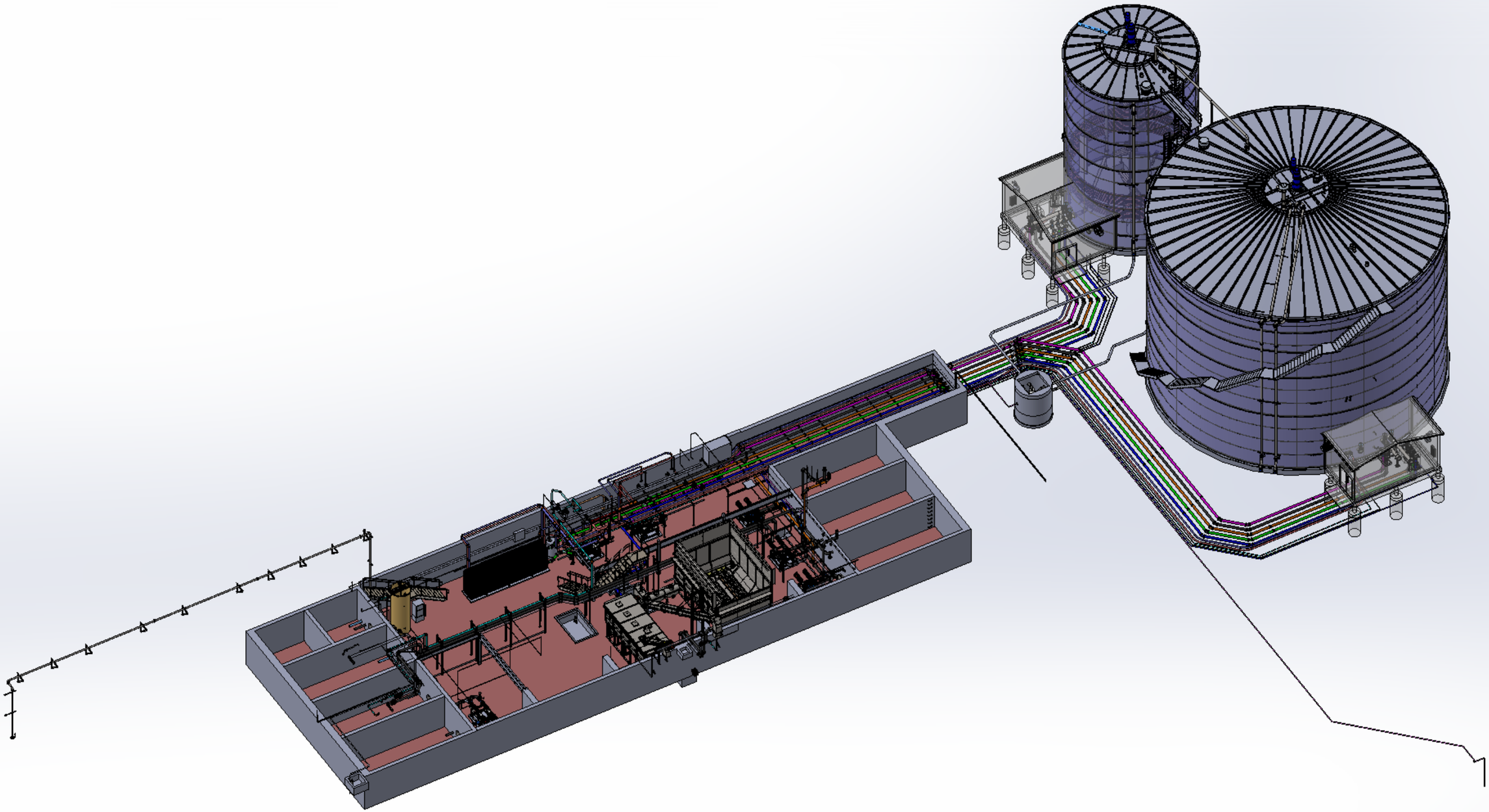
ACEng
ADAMS & CHRISTENSEN ENGINEERING, INC.
7762 WEXFORD CT.
GRAYSLAKE, ILLINOIS 60030
CERTIFICATE OF AUTHORIZATION NO. 05379

GREEN ARROW
2759 LONG ROAD
WOOSTER, OH 44691

DIGESTER BUILDING
LOWER LEVEL TANKAGE & BASEMENT VOLUME

GREEN ERA
650 W. 83RD ST.
CHICAGO, IL 60620

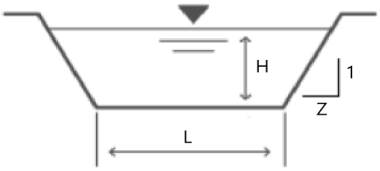
AREA	CHECKED BY NM
JOB NO. 1512	DRAWN BY BR
SCALE SEE NOTE	DATE 5/4/2022
DWG NO.	
SHEET NO. O-510	



Project: Green Era Secondary Containment
Title Overflow Weir Flow Rate
Date: 1/25/2023

TERRA ENGINEERING LTD.
225 West Ohio Street, 4th Floor
Chicago, Illinois 60610
T:(312)467-0123 F:(312) 467-0220

Calc: MBelongilot
Check: JHelfrich



Trapezoidal Weir Release Rate (Q) =	$CLH^{1.5} + \frac{4}{5}CZH^{2.5}$	
Crest Length (L) =	15	ft
Weir Height (H) =	0.33	ft
Side Slope (Z) =	3	:1
Weir Coefficient (C) =	3.0	(MWRD TGM 5-73)
Provided Release Rate (Q) =	8.98	cfs
Site Area =	8.91	
Required Release Rate =	1	cfs/ac
=	8.91	cfs

ATTACHMENT 13
SPILL EVALUATION, SPILL RESPONSE SOPs, AND RESPONSE COST BACKUP

SPILL EVALUATION

SPILL EVALUATION
(GREEN ERA RENEWABLE ENERGY & URBAN FARMING CAMPUS)

Facility Tanks

There are eight (8) tanks in use at the facility that are directly associated with the food waste composting process, including: two (2) 30,000-gallon sub-grade (in-ground, in-building) concrete storage tanks (T-050A and T-050B) for liquid food waste receiving, the slope-bottom grit hopper (in-building) with 5,500-gallon storage tank (T-065A), the 320,000-gallon Biomass Equalization Tank (T-100), the 1,680,000-gallon Digester Tank (T-105), the 30,000-gallon sub-grade (in-ground, in-building) concrete storage tank (T-205) for digestate, and the two (2) 30,000-gallon sub-grade (in-ground, in-building) concrete storage tanks (T-250A and T-250B) for filtrate. Additionally, sub-grade tanks T-210A and T-210C (16,157-gallons each; for future polymer storage) and sub-grade tank T-251 (33,429-gallons; for future Phase 2 project expansion use) are installed, but will be dedicated for contingent temporary containment of spilled digestate in the event of a spill.

Two (2) chemical tanks are also in use. The ethylene glycol tanks (T-400A and T-400B), 55-gallons and 238-gallons, are maintained in association with the non-contact heat transfer system.

Liquid Level and Overflow Control

All tank levels in the facility are continually monitored by the supervisory control and data acquisition (SCADA) system. The outside (yard) tanks (Biomass Equalization Tank and Digester Tank) use redundant level sensors. A hydraulic level is calculated from a pressure reading of a sensor that is installed within 24-inches of the tank floor. A distance measurement to the liquid level is also taken from a downward facing radar sensor mounted on the tank roof. The values are compared by the plant SCADA, and an alarm is sent to the plant operators if the liquid level is approaching the maximum fill level. Automatic pump processes that transfer material into the tank will also be automatically disabled in the event of a high liquid level. High tank levels may also be independently verified by visual inspection through Lexan viewing ports on the tank roof.

Process pipe connections made to nozzles at the base of the tank use a manual knife gate valve directly at the nozzle flange for positive shut-off and have an pneumatically actuated knife gate valve on each process pipe to/from the tank that are controlled by the SCADA.

Both yard tanks have a high-level overflow pipe that is directed to an underground concrete overflow sump (T-120) with a capacity of over 3,000-gallons. Pumps will transfer any captured liquids back to the liquid receiving tanks in the Process Building. The overflow sump pit level will be continually monitored by the SCADA. If any overflow is detected, the SCADA will stop all automated pumping processes to the tanks and close all valves. An alarm message will be sent to the plant operators and be visible on the SCADA.

Secondary Containment Available

To meet the requirements for secondary containment, most storage tanks at the facility are located inside of the Processing Building. The building has a lower level with cast-in-place concrete walls and floor. No trench or floor drains within the processing area of the building are connected to sanitary sewers. All trench drains and sumps within liquid storage areas direct captured liquids back to the two (2) liquid receiving tanks. The only floor drains connected to the sanitary sewer are in the ground level rooms of the facility (mechanical room, finished office area, and the restroom). The stormwater sump in the northwest basement floor is sealed closed, preventing any material spilled into the basement from subsequently pumping out of the building into the on-site stormwater sewer system. The main floor of the building is concrete slab and building walls are pre-cast concrete construction. These tanks are not exposed to precipitation.

The two (2) outdoor tanks at the facility have capacities of 320,000-gallons (Biomass Equalization Tank) and 1,680,000-gallons (Digester Tank). Both are above-grade bolted steel tanks with a cast-in-place concrete floor and foundation system. The smaller of the tanks, the Biomass Equalization Tank (T-100), will be used to store a slurry of macerated food waste and pumpable food waste. The larger tank, the Digester Tank (T-105), will be used as the anaerobic digestion “treatment” unit. The liquid in the Digester Tank is undergoing anaerobic digestion and is a high-strength wastewater.

As presently constructed, the facility does not have the ability to provide secondary containment capable of managing a catastrophic release: the full 1,680,000-gallons capacity of the Digester Tank and the additionally required freeboard of the 25-yr, 24-hr storm (5.7-in). Therefore, the property to the north of the facility has been leased with the intent to allow for the design and build of appropriately sized secondary containment. Engineering design work is presently being performed to develop the appropriately sized secondary containment sufficient to manage the full Digester Tank capacity plus the 25-yr, 24-hr storm. Until such time as the full secondary containment is in-place, the Digester Tank operating volume will be limited by the City of Chicago Liquid Waste Handling Facility permit to a maximum of 602,057-gallons, which is based upon the presently available secondary containment provided by the on-site stormwater detention basin (656,692-gallons) plus the on-site sewer system (24,738-gallons) minus 79,373-gallons of precipitation generated within the first 15-minutes of a 2-yr storm (after which high volume recovery efforts can be initiated).

The engineered grading of the facility in combination with a diversionary berm installed along the northern property boundary ensure that release from either of the outdoor storage tanks flows to the east and south, either overland into the on-site detention basin or into on-site sewers that drain to the detention basin, preventing a significant release of this type from flowing off-site. The adjacent elevated railway will prevent any westerly flow of a release. Based upon the topographic map developed for the facility and the presence of the on-site sewers, easterly flow will be limited to areas on-site (i.e. no off-site impact). (The diversionary berm to the north will be removed as part of the full-capacity secondary containment basing being designed for construction on the property to the north.)

RESTRICTED CAPACITY COMPLETE RELEASE SCENARIO

A complete release of the restricted Digester Tank volume of 602,057-gallons (or the full 320,000-gallon capacity of the Biomass Equalization Tank) may occur from intentional draining as malicious activity, unauthorized access, a terrorist attack on infrastructure, or complete tank failure and rupture. In the event of this type of release, a normally-open plug valve will be closed, temporarily converting the detention pond into a retention basin that will prevent a release from

the pond into the sewer system (i.e., preventing a slug discharge). Additionally, backflow preventers have been installed in the on-site sewer lines that are hydraulically connected to the pond, so that rising liquid levels in the pond will not backflow out the pond through the on-site sewers as the level rises. The plug-valve will not be re-opened until the full volume released is pumped from the pond and on-site sewer system into the basement of the Processing Building (647,035-gallons capacity) and spare sub-grade concrete storage tanks (additional 65,743-gallons). The combined capacity of the basement and spare tanks is 712,778-gallons, capable of holding 100% of the restricted capacity plus the 79,373-gallons of precipitation, with an excess capacity of 31,348-gallons. The detention basin has the volumetric capacity to hold the entire volume of the Biomass Equalization Tank (320,000-gallons). The transfer of the spilled material into the basement will be accomplished using three (3) diesel powered 1,250-GPM pumps (total capacity of 3,750-GPM) that will be maintained on-site at all times.

Because the current secondary containment for the facility relies upon active response activities beginning quickly in the event of a release, facility personnel will be trained in emergency response operations per 29 CFR 1910.120(q) to facilitate response actions in the event of a significant spill. Spill response equipment/supplies will be maintained on-site that are sufficient to address small-volume releases. Spill equipment includes simple tools (e.g., shovels, brooms, etc.), a 95-gallon spill kit, sorbent pads, and oil-dry. The spill materials are located in the maintenance area for quick access. In the event of a larger spill, additional assistance will be obtained from the spill response contractor/s to complete cleanup actions regarding a release (likely of any volume greater than a small-volume release handled by the 95-gallon spill kit). Entering into a contractual agreement with an emergency response contractor is recommended. Such a contractual agreement will ensure definite response with sufficient equipment in the event of a release and will provide the facility with a listing of available equipment and costs. Additionally, several standard operating procedures (SOPs) have been developed detailing required response and reporting in the event of a release. Those SOPs are included in the facility *Operations Manual*.

TYPICAL RELEASE SCENARIO

The most typical releases that would be expected at this facility are minor spills/leaks from drums/totes and/or drips/spills during transfer operations. Each of these releases would be contained by the confines of the Processing Building and would be addressed via prompt response by on-site personnel utilizing spill supplies and/or by engaging the emergency response contractor.

For the outdoor tanks, the most likely release scenario would be the result of a tank overflow of an estimated 1,000-gallons. The liquid levels in the tanks are continuously monitoring, and transfers are controlled by the SCADA system. If a tank were to overflow, it would be expected to be the result of biological activity (upset conditions) that entrains gases and increases the absolute stored liquid volume, most commonly caused by overfeeding (too many calories too fast). Both tanks are connected to the overflow sump with 3,000-gallons capacity, so no release should occur. If this situation were to occur at a time when the overflow sump were already at 100% capacity (a highly unlikely scenario, as the overflow sump discharges liquids back to the liquid receiving tanks), the excess liquids released from the overflow sump would be expected to spread laterally across the ground and then flow with the engineered grading of the facility towards on-site storm sewers that discharge into the on-site stormwater detection pond. The pond has sufficient capacity to address the entire 1,000-gallons, though it would be expected that some portion of the released liquids would infiltrate into the unpaved ground that surrounds the tanks and sump. On-site spill supplies and the emergency response contractor would be engaged to address the release. No off-site impact to sewers or property are expected in the event of a typical release scenario.

SOP-21-009
CATASTROPHIC SPILL CONTAINMENT PLAN

Green Era	**Standard Operating Procedure** **Catastrophic Spill Containment Plan**	SOP-21-009 Revision: 1 Effective: 02/20/23 Reviewed: 02/20/23

1 Purpose

This SOP establishes consistent methods for responding to spills in excess of 50,000 gallons, procedures for containment, mitigating the impact, clean-up, recordkeeping, and notification.

2 Scope

This SOP applies to facility operations at the Green Era digester facility.

3 Definitions and Acronyms

3.1 Carbon Dioxide

Odorless, colorless gas that is non-combustible. Carbon dioxide is produced by bacteria during anaerobic digestion and may be released from feedstock or digestate during a spill event. In confined spaces, carbon dioxide can displace oxygen and represents a suffocation hazard.

3.2 Catastrophic Spill

Any unintended release of digestate or feedstock from piping, tanks, or other vessels to the environment that is in excess of 50,000 gallons or is expected to exceed 50,000 gallons when the source of the spill cannot be stopped or contained in a timely manner. The only storage facilities at Green Era in excess of 50,000 gallons are the biomass tank and the digester tank.

3.3 Digestate

Digestate is the resultant liquor after the process of anaerobic digestion has treated the feedstock. For this facility, digestate is always pumpable. Digestate can contain pathogens. The pH of the digestate is normally slightly alkaline and can range from 7.2 pH to 8.5 pH. Digestate may produce hazardous gasses including methane, carbon dioxide, and hydrogen sulfide. The digestate contains a significant amount of plant available nitrogen and phosphorus, similar to liquid animal manures.

3.4 Feedstock

Any solid or pumpable untreated organic waste that is received by the facility for treatment by anaerobic digestion, whereby volatile solids will be reduced and pathogens will be reduced. Feedstock can contain pathogens. The pH of feedstock varies depending on the source organic material. It is often acidic, especially after holding in a tank. The pH of hydrolyzed feedstock within the feedstock tank can vary from 3 to 5 SU. Feedstock may produce hazardous gasses including methane, carbon dioxide, and hydrogen sulfide.

3.5 4 gas meter

A portable safety device that is used to detect the presence of combustible gasses, low oxygen levels, and hydrogen sulfide. Fire departments will have these meters on the truck. Green Era keeps these meters at the plant.

3.6 Hydrogen Sulfide

Colorless gas that has a pungent smell similar to rotten eggs, natural gas odorants, or a skunk. Hydrogen sulfide can be smelled at levels lower than 1 part per million. Hydrogen sulfide can accumulate in confined spaces and is toxic. 10 PPMV is the OSHA permissible exposure limit over an 8-hour time weighted average. A personal respirator should be worn when H2S is detected above 5 PPMV by a 4-gas meter.

3.7 Methane

Odorless, colorless gas that is combustible and can be an explosive hazard in the presence of oxygen. Methane is produced by bacteria during anaerobic digestion and may be released from digestate during a spill event.

3.8 Plant Operator

Onsite personnel who have the designated responsibility to operate and maintain the facility on behalf of Green Era.

3.9 Acronyms

SOP – Standard Operating Procedure
PPE – personal protective equipment

4 Procedure in the event of a catastrophic spill

4.1 Evacuate the area to protect yourself and others

First move to a safe location to assess the spill. Be aware of gasses that may be released from the spill. Move to a well-ventilated area if inside, or upwind, if outdoors. Gather and use PPE equipment as needed before reentering the spill affected area. PPE equipment will depend on the hazard, but is likely to include gloves, boots, respirator, and a 4-gas meter.

4.2 Get help and Notify

Notify others nearby first to alert them to the spill and have them visually monitor the activity from a safe location. Do not reenter the spill affected area without having one or more persons onsite who would be able to help if you have an accident containing the spill. Contact the plant operations manager if not already notified. If the spill, of 25 gallons or more, occurred on a public site, call the IEPA Spill Hotline at 1-800-282-9378.

4.3 IEMA Spill Notification 1-800-782-7860 (25 gallons or more that isn't contained on Green Era's property)

If contacting the Illinois Emergency Management Agency, plan to provide the following information.

4.3.1 Responsible Party – name of carrier

4.3.2 Date/time of the spill

4.3.3 Location (address, cross-street, or mile marker) use phone to determine location if needed.

4.3.4 Materials (cake solids, digestate, or feedstock product) If the result of a traffic accident, check for diesel or fuel leakage.

4.3.5 Quantity (estimated spilled and the total potential amount – size of tank)

4.3.6 Hazards (pathogens, H2S) and advise for any first responders

4.3.7 Affected media/area (air, land or waterway, including threats to ditches, storm sewers, and streams)

4.3.8 Actions/notifications (evacuations, containment, contractor hired for cleanup)

4.3.9 Contacts on the scene (responder cell phone, responsible party, contractor, facility point of contact)

4.3.10 Other useful info. (Truck DOT number etc.)

4.4 Stop the source of the spill

If possible, stop further material from being spilled and/or take steps to reduce the flow of material from the containment.

4.4.1 Close valves

If a pipe has broken, and an upstream valve is accessible, close the valve.

4.4.1.1 Feedstock tank valves

Two 10-inch manual valves are located in the tank building and supply the manifolds. The suction manifold valve is labeled HVK-100B and the valve may be closed by turning the wheel clockwise to seat the knife gate.

The pressure manifold valve is labeled HVK-100A and the valve may be closed by turning the wheel clockwise to seat the knife gate.

4.4.1.2 Digester tank valves

Two 10-inch manual valves are located in the tank building and supply the manifolds. The suction manifold valve is labeled HVK-105B and the valve may be closed by turning the wheel clockwise to seat the knife gate.

The pressure manifold valve is labeled HVK-105A and the valve may be closed by turning the wheel clockwise to seat the knife gate.

4.4.2 Stop pumping

For tank overflows, stop pumping into the tank and begin to transfer out of the tank to other tanks with available storage volume, if possible.

4.5 Contain the spill

4.5.1 Close the plug valve at the normal outlet (CB13) of the stormwater detention pond.

Spilled sludge on the site will flow to the stormwater detention pond through the stormwater drainage system.

The normal outfall of the detention pond (at CB13) is an 8-inch diameter outfall to the combined sanitary/storm sewer from a manhole at the southeast corner of the site. A pond overflow outfall (STM MH8) is also present along the southern boundary of the detention pond.

To prevent any sludge or sludge and stormwater from entering the combined sewer, the plug valve at CB13 at the outfall from the detention pond should be manually closed.

To close the plug valves, use a valve wrench to turn the valve clockwise until the plug seats. A valve wrench will be stored at all times in a labeled and capped PVC pipe at the fence for emergency use.

Notify the Operations Manager that the plug valve has been closed and any other authorities. Leave the valve wrench on the valve.

Upon completion of the removal of spilled digestate from the detention pond and any other areas on Site that could discharge to the detention pond, open the plug valves at the outlets of the storm water detention pond, so that the pond can function as primarily designed (i.e., to convey storm water in a controlled manner from the Site to the sewer system).

4.5.2 Consider if diverting digestate to Processing Building lower level is necessary

Refer to procedures specified in SOP-21-010 (Flooding Lower Level of Process Building). In the event of a large volume spill that would otherwise flow off-site, close the outfall plug-valve at the detention pond, and then pump from the

detention pond to the lower level of the building, so as to recapture the ability of the detention pond to function as designed (i.e., with an outfall to the sewer system).

4.5.3 Determine if the stormwater pond will overflow

As constructed (13.00 CCD HWL), the total detention basin volume is 656,692-gallons. There is an additional 24,738-gallons of temporary storage volume in on-site sewer pipes and structures when the outfall of the detention pond at catch basin CB13 has been closed off, resulting in a total temporary storage volume in the pond of 681,430-gallons. The available volume to temporarily store spilled digestate will depend upon whether any of this total temporary storage volume is lost or will be lost due to temporary storage of actual storm water from a precipitation event. Consult the weather forecast and consider whether the full possible volume of the basin is available for temporary digestate storage. The City of Chicago Liquid Waste Facility permit limits the operating volume of the digester tank to 602,057-gallons. As such, there is an allowance for temporary storage of a precipitation volume of 79,373-gallons, and it is not expected that the stormwater pond will overflow even in a catastrophic spill event.

Follow the procedure in SOP-21-010 to flood the lower level from the digester tank or feedstock tank.

4.5.4 Construct Berms

Build berms with available material to contain spill and direct fluid towards the storm water drains, swales, ditches that lead to the stormwater detention pond. Bermed dirt can be effective in diverting flow. A dug hole can help to pump up material with a vac truck. Fine shredded bark mulch and/or saw dust can be effective in absorbing small amounts of spilled liquid so it can be handled as a solid. Straw bales can be used to dike ditches if staked.

4.6 Pump Spilled Material From Pond

The Operations Manager will direct on-site personnel to mobilize the on-site high-capacity diesel powered recovery pumps, and initiate the pumping of accumulated liquid from the detention pond to the lower level of the building. Locate the pump in an area adjacent to the pond that is accessible and can be reached with 24’ of suction hose. Attach the suction hose to the inlet of the pump with the quick coupler. Layout the dragline hose from the pump to the building using a telehandler or skidsteer to manage the reel. Couple the hose to the discharge side of the pump. Place the discharge end of the hose in the grit tank so the pumped flow can be contained and stilled prior to overflowing into the pit. Snake any excess length in the yard so it isn’t pinched. Once the pumps and hoses have been positioned at the pond, but prior to initiating

pumping, ensure that the procedures specified in SOP-21-010 Flooding Lower Level of Process Building have been completed. Then, initiate pumping by following the procedures on the pump skid to start the pump. Continue pumping until the recoverable liquids and sludge in the pond have been removed or the lower level detention area is full.

4.7 Contact Emergency Response Contractors

Call emergency response contractors to start the mobilization of vacuum recovery trucks to the Site, and to secure additional equipment and manpower assistance (as necessary) to respond to the spill. A list of such contractors will be maintained at the Site, and updated every 6-months. See below for a current list. This list must be updated every 6-months. The vacuum recovery trucks are expected to be the primary means to remove the liquid and sludge from the lower level of the building to off-site discharge/disposal options.

PRIMARY EMERGENCY RESPONSE CONTRACTOR
SET Environmental; Wheeling, IL (877-437-7455)

OTHER EMERGENCY RESPONSE CONTRACTORS
HazChem Environmental; Addison, IL (630-458-1910)
Heritage Environmental; Lemont, IL (877-436-8778)
Clean Harbors; New Lenox, IL (815-836-8813)
GFL (formerly Future Environmental); Mokena, IL (708-479-6900)
Safety-Kleen; Dolton, IL (708-225-8500)
ERC Midwest (formerly North Branch); Roselle, IL (630-529-0240)

Other potential haulers include the following:

New Era Spreading; Grant Park, IL (815-693-7695)
Walter and Son Hauling, Darien, WI (262-882-7867)

4.8 Open Plug Valve at Outfall of Detention Pond

Once the recoverable liquids/sludge from the detention pond have been pumped out, open the plug valve at the outfall of the detention pond (CB13).

4.9 Document the extent of the spill

Use a cell phone or digital camera to take photos and/or video of the spill source, affected area and containment. Use voice memos or take notes for further incident documentation and reporting. Note the time the spill occurred and the time when the spill was contained.

4.10 Perform Additional Site Cleanup Activities

Use water to irrigate areas with accumulated sludge and use pumps or vac trucks to remove wastewater from low areas or temporary sump pits.

4.10.1 Spills on impervious (paved) surfaces

Use rubber squeegees, brooms and flat scoop shovels, to remove bulk material from paved areas and roadways. Push to an area where bulk material can be contained and removed. After removing bulk sludge from the paved surface, flush the surface with fresh water after a spill to clean. A pressure washer service or vac truck with water on board may be used effectively depending on the spill type.

4.10.2 Spills on aggregate (stone)

For areas with compacted stone or gravel, irrigate with a fire hose to flush solids towards temporary sump pits and use a vac truck to remove surface water.

4.10.3 Spills on vegetated surfaces outside detention pond

Use a fire hose with a flat low velocity spray to wash any ponded sludge towards low spots or temporary sump pits to recover additional wastewater. Plant seasonal rye grass or other grass covers in areas with disturbed soils. Erect silt fencing until grasses establish to mitigate solids runoff.

4.11 Off-Site Disposal of Recovered Liquid and Sludge

The preferred disposal location of the recovered liquid and/or sludge is the MWRD Calumet Water Reclamation Plant, which has a High Strength Organic Materials (HSOM) acceptance program. However, in the event the recovered digestate cannot be sent to the MWRD, the following facilities are located within a reasonable distance from the Site and could be used as alternate disposal options to the MWRD Calumet Plant:

Liquid Environmental Solutions; Chicago, IL (866-694-7327)
Circon Environmental (formerly Beaver Oil); Hodgkins, IL (219-881-9234)
Circon Environmental (formerly Water Integrated Treatment Systems); Dolton, IL (708-880-0400)

Finally, another potential destination for the recovered digestate would be at land application (agricultural) sites, though given the further travel distance, closer, more cost-effective options would be initially utilized.

4.11.1 Spills on impervious (paved) surfaces

Use rubber squeegees, brooms and flat scoop shovels, to remove bulk material from paved areas and roadways. Push to an area where bulk material can be contained and removed.

4.11.2 Public Roadways

While site conditions and the restriction on the operating volume of the digester should preclude any off-site impacts even in the event of a catastrophic spill, the following direction is provided as a precaution. Should any spilled materials flow to off-site public roadways, follow the following procedures:

- Set up cones and have someone direct traffic away from the spill as necessary.
- Notify the City of Chicago by calling 911 if a large or catastrophic spill. Also, notify City of Chicago Department of Public Health via email per the Liquid Waste Handling Permit requirements.
- After removing bulk sludge from a roadway, flush the roadway with fresh water after a spill to clean. The size of the spill on a public roadway and length of affected area will determine the type of equipment used to irrigate the road. A pressure washer service or vac truck with water on board may be used effectively depending on the spill type. If there is a major public safety issue or the spill occurred on a busy highway, the local authority may have the fire department respond to assist. Roadways should be cleaned to the satisfaction of the local authority.

4.12 Document the clean-up

Use a cell phone or digital camera to take photos and/or video of the cleaned area. Use voice memos or take notes for further incident documentation and reporting of the clean-up methods used. Be sure to note who responded to the spill, who assisted with clean-up, and equipment that was used. Note the time when the clean-up started and when it was completed.

4.13 Additional Internal Notification

The Operations Manager should be informed of the spill and s/he should inform the rest of the staff and management team. If team members cannot immediately be reached via cell phone and text messages, messages should be left on their devices that explain the situation.

4.14 Regulatory Notification

In addition to the notifications to the City of Chicago via 911 in the event of a catastrophic spill, if the spill was more than 25 gallons and occurred offsite, the spill should be reported the Illinois EPA (217-782-3637) and a spill report should be filed with their office. Initial notification should occur within 24 hours of the incident with report to follow within 5 days.

Contact the MWRD (312-751-5600) if any slug discharge or potential slug discharge will occur as a result of the spill or clean-up. The storm water and sanitary sewers are a combined system at the Green Era plant and they are treated by the Stickney Water Reclamation Plant.

4.15 Record retention

Spill reports and incident records should be retained for the life of the facility.

5 References

5.1 MP-06 Green Era Emergency Response Plan

5.2 Record drawings, stored onsite, Site Utility Plan (C-4), Building Plumbing Plans

5.3 SOP-21-010 Flooding Lower Level of Process Building

5.4 MP-14 SPCC Plan

SOP-21-010
FLOODING LOWER LEVEL OF PROCESS BUILDING

Green Era	**Standard Operating Procedure Flooding Lower Level of Process Building**	SOP-21-010 Revision: 1 Effective: 02/20/23 Reviewed: 02/20/23

1 Purpose

This SOP provides steps necessary to safely flood the lower level of the process building with digestate or feedstock when required for additional containment volume after a catastrophic spill.

Refer to SOP-21-009 for the Catastrophic Spill Containment Plan for the steps in the decision-making process.

2 Scope

This SOP applies to facility operations at the Green Era digester facility.

3 Definitions and Acronyms

3.1 Carbon Dioxide

Odorless, colorless gas that is non-combustible. Carbon dioxide is produced by bacteria during anaerobic digestion and may be released from feedstock or digestate during a spill event. In confined spaces, carbon dioxide can displace oxygen and represents a suffocation hazard.

3.2 Catastrophic Spill

Any unintended release of digestate or feedstock from piping, tanks, or other vessels to the environment that is in excess of 50,000 gallons or is expected to exceed 50,000 gallons when the source of the spill cannot be stopped or contained in a timely manner. The only storage facilities at Green Era in excess of 50,000 gallons are the biomass tank and the digester tank.

3.3 Digestate

Digestate is the resultant liquor after the process of anaerobic digestion has treated the feedstock. For this facility, digestate is always pumpable. Digestate can contain pathogens. The pH of the digestate is normally slightly alkaline and can range from 7.2 pH to 8.5 pH. Digestate may produce hazardous gasses including methane, carbon dioxide, and hydrogen sulfide. The digestate contains a significant amount of plant available nitrogen and phosphorus, similar to liquid animal manures.

3.4 Feedstock

Any solid or pumpable untreated organic waste that is received by the facility for treatment by anaerobic digestion, whereby volatile solids will be reduced and pathogens will be reduced. Feedstock can contain pathogens. The pH of feedstock varies depending on the source organic material. It is often acidic, especially after holding in a tank. The pH of hydrolyzed feedstock within the feedstock tank can vary from 3 to 5 SU. Feedstock may produce hazardous gasses including methane, carbon dioxide, and hydrogen sulfide.

3.5 4 gas meter

A portable safety device that is used to detect the presence of combustible gasses, low oxygen levels, and hydrogen sulfide. Fire departments will have these meters on the truck. Green Era keeps these meters at the plant.

3.6 Hydrogen Sulfide

Colorless gas that has a pungent smell similar to rotten eggs, natural gas odorants, or a skunk. Hydrogen sulfide can be smelled at levels lower than 1 part per million. Hydrogen sulfide can accumulate in confined spaces and is toxic. 10 PPMV is the OSHA permissible exposure limit over an 8-hour time weighted average. A personal respirator should be worn when H2S is detected above 5 PPMV by a 4-gas meter.

3.7 Methane

Odorless, colorless gas that is combustible and can be an explosive hazard in the presence of oxygen. Methane is produced by bacteria during anaerobic digestion and may be released from digestate during a spill event.

3.8 Plant Operator

Onsite personnel who have the designated responsibility to operate and maintain the facility on behalf of Green Era.

3.9 Acronyms

SOP – Standard Operating Procedure
PPE – personal protective equipment

4 Steps to transfer sludge into the lower level pit area for containment

4.1 Get help and Notify

Notify others nearby first to alert them to the intent to use the lower level for containment and have them visually monitor the activity from a safe location. Do not reenter the spill affected area without having one or more persons onsite who would be able to administer first aid and call for additional help if any injuries occur while containing the spill. Contact the plant Operations Manager if not already notified.

4.2 Passive Ventilation

Open all overhead doors to the process building to allow for passive airflow through the building. Large volumes of sludge flowing into the open lower level have the potential to release gases into the building including carbon dioxide, methane, and hydrogen sulfide.

4.3 Safety Equipment

Anyone entering the building during the flooding event shall have a personal 4-gas meter with them at all times.

4.4 Disconnect Power

Power should be removed from the following MCCs and Panels at the main disconnect switch for each panel. Follow Lockout Tagout procedures per SOP-21-003. One-line drawings and location drawings for these panels are attached to this SOP for reference.

4.4.1 MCC-1A, RM 112

4.4.2 MCC-1B, RM 112

4.4.3 MCC-2A, RM 124

4.4.4 MCC-2B, RM 124

4.4.5 LP-1, RM 112

4.5 Pump spilled liquid from Detention Pond and Other Accumulated Areas to Lower Level

Refer to SOP-21-009 Catastrophic Spill Containment Plan, for procedures to pump spilled liquid into the lower level of the building

4.6 Confirm everyone is in a safe location

4.7 Ensure everyone is outside the building before proceeding to pump fluids into the lower level. Monitor the fluid level in the building to prevent overfilling

Allow the pit to fill until within 6-inches of the main floor. The lower building level can contain 600,000 gallons of sludge. If the pit is overfilled, sludge will overflow onto the main level will exit the building through the overhead door openings.

4.8 Stop the flow to the lower level

Stop the flow and pumping of liquid into the lower level. If the source of the main spill is able to be stopped while the lower level is being filled, pumping of sludge into the lower building level can also be stopped.

4.9 Document the extent of the spill

Use a cell phone or digital camera to take photos and/or video of the spill source, affected area and containment. Use voice memos or take notes for further incident documentation and reporting. Note the time the spill occurred and the time when the spill was contained.

4.10 Clean up

4.10.1 Remove liquid from the building lower level

Use vac trucks to remove sludge from the lower level or set-up a self-priming engine driven pump to load trucks through a hose or top-fill pipe cart.

4.10.2 Pressure wash

Clean all walls and equipment surfaces with pressure washers to remove solids. Remove wash water from sumps with vac trucks or self-priming engine driven pumps.

4.10.3 Remove motors

Remove all motors and gearboxes that were submerged.

Send to shop for cleaning, seal and bearing replacements, and testing.

Reinstall motors after reconditioning.

4.10.4 Inspect electrical components and wiring

Meg-Ohm test each motor branch circuit prior to restoring power.

Test one circuit at a time from each affected MCC and panel.

Commission each motor and piece of equipment independently after reinstallation of the motor to check for proper rotation.

4.11 Document the clean-up

Use a cell phone or digital camera to take photos and/or video of the cleaned area. Use voice memos or take notes for further incident documentation and reporting of the clean-up methods used. Be sure to note who responded to the spill, who assisted with clean-up, and equipment that was used. Note the time when the clean-up started and when it was completed.

4.12 Record retention

Spill reports and incident records should be retained for the life of the facility.

5 References

5.1 MP-06 Green Era Emergency Response Plan

5.2 SOP-21-009 Catastrophic Spill Containment

6 Reference Electrical Drawings

1. GAE DE-501, Room 124 Process Electrical
2. GAE DE-502, Room 112 Process Electrical
3. GAE DE-510, Lower Level Process Electric
4. GAE 1512-2001-105, One-line diagram, MCC-1A
5. GAE 1512-2002-105, One-line diagram, MCC-1B
6. GAE 1512-2003-105, One-line diagram, MCC-2A
7. GAE 1512-2004-105, One-line diagram, MCC-2B
8. MC2 Elect. E-002, LP-1 One-line

RESPONSE COST BACKUP

XXXX ENVIRONMENTAL CORPORATION

Estimation Backup for Emergency Response to 650 W. 83rd Street Catastrophic Spill to Detention Pond

Rate Sheet - Contract

ASSUMES 3-DAYS (24-HRS/DAY) CLEANUP PLUS 1-DAY MOB, 1-DAY DEMOB

LABOR

Title/Position	Rate	# of People	Hours Worked	Extended
Principal, Straight Time	$190.00			$0.00
Principal, **Overtime**	$285.00			$0.00
ER Manager, ST	$119.00	1	8	$952.00
ER Manager, **OT**	$178.00	1	4	$712.00
Equipment Operator, ST	$99.00	1	8	$792.00
Equipment Operator, **OT**	$148.50	1	4	$594.00
Project Technician, ST	$89.00	1	8	$712.00
Project Technician, **OT**	$133.50	1	4	$534.00
Field Support	$49.00			$0.00
Response Fee, ST	$100.00			$0.00
Response Fee, **OT**	$150.00			$0.00
Per Diem	$150.00			$0.00

Labor Total 3-people/shift $4,296.00

EQUIPMENT

Vehicles & Trailers	Rate	How many	Hours Used	Extended
Automobile / Per Hour	$40.00			$0.00
Pick-up / Per Hour	$49.00	1	12	$588.00
Emergency Response Truck / Per Hour	$129.00	1	12	$1,548.00
Box Truck 24' / Per Hour	$129.00			$0.00
Tractor Trailer Combo/ Per Hour	$130.00			$0.00
3,000 Gallon Vac Truck / Per Hour	$135.00	2	12	$3,240.00
5,500 Gallon Vac Truck / Per Hour	$159.00			$0.00
Level C & D Trailer / Per Hour	$60.00			$0.00
Level A & B Trailer / Per Hour	$290.00			$0.00
48'-53' Semi Trailer Only / Per Day	$70.00			$0.00
Heavy Equipment	**Rate**	**How Many Hours**		**Extended**
Bobcat / Per Hour	$125.00	12		$1,500.00
Bobcat Sweeper/ Per Hour	$90.00			$0.00
Bobcat Forklift Attachment / Per Hour	$15.00			$0.00
Forklift (includes 1 propane tank) / Per Hour	$95.00			$0.00
Equipment	**Rate**	**How Many**	**Hours Days Each**	**Extended**
Generator/ Per Day	$105.00			$0.00
Portable Light Stand / Per Day	$65.00			$0.00
3000 PSI Hot Water Washer with Water Tank / Per Hour	$79.00		Hours	$0.00
Air Compressor Portable / Per Hour	$25.00		Hours	$0.00
Chain Saw / Per Day	$100.00			$0.00
Concrete Cut *Off* (includes 1 blade) / Per Day	$100.00			$0.00
Electric Hand Tools / Per Day	$45.00			$0.00
Air Hand Tools / Per Day	$45.00			$0.00
Jack Hammer 70 lb. / Per Day	$105.00			$0.00
Pallet Jack / Per Day	$35.00			$0.00
Non-Sparking Tool Kit/ Per Day	$50.00			$0.00
Betts Emergency Unloading Valve / Per Day	$555.00			$0.00
Propane Heater / Per Day (does not include fuel)	$95.00			$0.00
Barricade s/Horses - Per Each/Pe r Day	$15.00			$0.00
Portable Fencing, 20' Sections - Per Each / Per Day	$9.00			$0.00
Safety Cones - Per Each / Per Day	$1.00			$0.00
Fan, Industrial 72" / Per Day	$95.00			$0.00

SawzAll (no blades) / Per Day	$35.00			$0.00
Blades / Per Each	$3.00			$0.00
Portable Heater 150,000 BTU / Per Day (does not include fuel)	$190.00			$0.00
Power Sweeper	$110.00			$0.00
Gamma Jet	$450.00			$0.00
Air Compressor Large	$295.00			$0.00
Brass Tool Set	$75.00			$0.00
Chop Saw	$125.00			$0.00
Drill	$25.00			$0.00
Drum Cart	$15.00			$0.00
Evacuation Fan	$99.00			$0.00
Light Tower Tow Behind	$295.00	5		$1,475.00
Pumps	**Rate**	**How Many**		**Extended**
Disposable Hand Pump / Per Each	$40.00			$0.00
3/4" Fuel Transfer Pump / Per Hour	$25.00		Hours	$0.00
1-1/2" Double Diaphragm Pump / Per Hour	$35.00		Hours	$0.00
2" Double Diaphragm Pump / Per Hour	$50.00		Hours	$0.00
2" Stainless Steel Double Diaphragm Pump / Per Hour	$60.00		Hours	$0.00
2" Submersible Pump / Per Hour	$25.00		Hours	$0.00
2" Trash Pump / Per Hour	$25.00	24	Hours	$600.00
2" Chemical Hose - Per Foot / Per Day	$2.00			$0.00
2"-3" Suction Hose - Per Foot / Per Day	$2.00			$0.00
Discharge Hose - Per Foot / Per Day	$2.00			$0.00
Hudson Sprayer / Per Each	$20.00			$0.00
Micro-blaze pumps and hoses / Per Hour	$25.00		Hours	$0.00
Vacuum Equipment	**Rate**	**How Many**		**Extended**
Mercury Vacuum / Per Day	$40.00			$0.00
Wet/Dry (55 Gallon Tornado) / Per Day	$95.00			$0.00
HEPA 20 Gallon Vacuum / Per Day	$275.00			$0.00
Confined Space Equipment	**Rate**	**How Many**		**Extended**
Body Harness / Per Day	$60.00			$0.00
Negative Air Vent System (excludes tubing) / Per Day	$95.00			$0.00
Confined Space Tripod (Winch System) / Per Day	$240.00			$0.00
Venturi Air Blower / Per Day	$60.00			$0.00
Negative Air Tubing / Per Roll	$110.00		Rolls	$0.00
Negative Air Filter / Per Each	$40.00			$0.00
Breathing Air Equipment	**Rate**	**How Many**		**Extended**
30 Minute SCBA (excluding refills) - Per Person / Per Day	$175.00			$0.00
Cascade Air System (excluding refills) - Per Person / Per Day	$75.00			$0.00
Electronic Devices / Monitoring Equipment	**Rate**	**How Many**		**Extended**
4 Gas Meter with PID / Per Day	$195.00			$0.00
Nippon Mercury Meter / Per Day	$350.00			$0.00
Draeger Testing Unit / Per Day	$30.00			$0.00
Draeger Testing Tubes / Per Each	$25.00			$0.00
Intrinsically Safe 2-Way Radio / Per Day	$100.00			$0.00
Laptop / Per Day	$50.00			$0.00
Digital Camera / Per Day	$35.00	1		$35.00

Equipment Total	$8,986.00

CONSUMABLES

PPE Ensembles	**Rate**	**How Many**		**Extended**
Level "A" (Encapsulated Suit w/ Supplied Air) / Per Set	$1450.00			$0.00
Level "B" (Chemical Resistant Suit w/ Supplied Air)/ Per Set	$395.00			$0.00

Level "C" (Tyvec **w/** Air Purifying Respirator) / Per Set	$130.00			$0.00
Level "D" (Hard Hat, Safety Glasses, Steel-Toed Boots)/ Per Set	$65.00	3		$195.00
PVC Acid Suit / Per Set	$70.00			$0.00
Poly Coated Suit / Per Set	$35.00			$0.00
Saranex Suit / Per Set	$49.00			$0.00
Latex Boot Covers / Per Pair	$6.00			$0.00
Bala HazMax Boots / Per Pair	$85.00			$0.00
Chern Kleen Boot Cove rs / Per Pair	$3.00			$0.00
Fire Resistant Coveralls / Per Each	$35.00			$0.00
Butyl Gloves / Per Pair	$7.00			$0.00
Hip Waders / Per Each	$40.00			$0.00
Respiratory Protection	**Rate**	**How Many**		**Extended**
Cartridges - GME / Per Set	$35.00			$0.00
Cartridges - GME P-100 / Per Set	$60.00			$0.00
Cartridges - Mersorb P-100 / Per Set	$80.00			$0.00
Dust Mask / Per Each	$3.00			$0.00
SCBA Re fill Bottle / Per Each	$40.00			$0.00
Large Air Cylinders / Per Each	$80.00			$0.00
Containers	**Rate**	**How Many**		**Extended**
5 Gallon, Poly (OH) / Per Each	$13.50			$0.00
15 Gallon, Poly (OH) / Per Each	$99.00			$0.00
15 Gallon, Poly (TH) Per Each	$79.00			$0.00
30 Gallon, Poly (OH) / Per Each	$109.00			$0.00
30 Gallon, Poly (TH) / Per Each	$95.00			$0.00
30 Gallon, Steel (OH) / Per Each	$55.00			$0.00
30 Gallon, Steel (TH) / Per Each	$55.00			$0.00
55 Gallon, Poly (OH) / Per Each	$105.00			$0.00
55 Gallon, Poly (TH)/ Per Each	$95.00			$0.00
55 Gallon, Steel (OH) / Per Each	$79.00			$0.00
55 Gallon, Steel (TH) / Per Each	$79.00			$0.00
85 Gallon, Steel, Overpack / Per Each	$325.00			$0.00
95 Gallon, Poly, Overpack / Per Each	$325.00			$0.00
11O Gallon, Steel, Overpack / Per Each	$450.00			$0.00
Super Sack , Overpack / Per Each	$150.00			$0.00
Cubic Yard Box, w/ Liner & Skid / Per Each	$120.00			$0.00
PIH Box (Poison Inhalation Hazard) / Per Each	$45.00			$0.00
330 Gallon IBC - re-bottled	$395.00			$0.00
55 Gallon Lid / Per Each	$9.00			$0.00
55 Gallon Ring/Bolt/ Per Each	$9.00			$0.00
Absorbents	**Rate**	**How Many**		**Extended**
Oil Dry / Per Bag	$13.00			$0.00
Universal Pads / Per Bag	$85.00			$0.00
Oil Only Pads / Per Bag	$85.00			$0.00
8' x 1O' Oil Boom / Per Section	$55.00	0		$0.00
36" x 100' Pad, Roll, Universal/ Per Roll	$220.00			$0.00
36" x 100' Pad, Roll, Oil / Per Roll	$260.00			$0.00
Skirted Boom - Per Section / Per Day	$250.00			$0.00
Vermiculite / Per Bag	$30.00			$0.00
Dust Suppressan t / Per 50 lb. Bag	$50.00			$0.00
Kem Kob / Per Bag	$35.00			$0.00
Chemicals	**Rate**	**How Many**		**Extended**
Alconox / Per Box	$60.00			$0.00
Citric Acid / Per 50 lb. Bag	$150.00			$0.00
Epoxy Paint/ Per Set	$170.00			$0.00
SCS-100, LEL Suppressant / Per Gallon	$75.00		Gallon(s)	$0.00
HGCS-102 - Mercury Cleaner / Per Gallon	$75.00		Gallon(s)	$0.00
HMCS-101 - Heavy Metal Cleaner / Per Gallon	$75.00		Gallon(s)	$0.00

PCB Cleaner / Per Gallon	$75.00		Gallon(s)	$0.00
Met-L-X Powder / Per 50 lb. Bag	$250.00			$0.00
Mineral Oil / Per Gallon	$30.00			$0.00
Simple Green / Per Gallon	$30.00			$0.00
Sodium Bicarbonate / Per Bag	$75.00			$0.00
Sodium Hypochlrorite 12% / Per Gallon	$75.00		Gallon(s)	$0.00
Miscellaneous Supplies	**Rate**	**How Many**		**Extended**
55 Gallon Drum Liners / Each	$2.00			$0.00
85 Gallon Drum Liners / Each	$4.00			$0.00
Poly Sheeting 6 Mil 20x100 / Per Roll	$95.00			$0.00
Duct Tape / Per Roll	$7.00			$0.00
Caution Tape / Per Roll	$30.00			$0.00
8' x 50' Excelsior Blanket with Seed / Per Roll	$125.00			$0.00
Disposable Brushes / Per Each	$9.00			$0.00
Disposable Sewer Mat / Per Each	$325.00			$0.00
Funnels / Per Each	$25.00			$0.00
Glass Coliwasas / Per Each	$25.00			$0.00
Mercury Charcoal Filter / Per Each	$950.00			$0.00
Mercury Vacuum Bag, Cup & Filter/ Per Each	$95.00			$0.00
Shrink Wrap/ Per Roll	$35.00			$0.00
Tape/Chem Tape / Per Roll	$40.00			$0.00
Mop & Bucket / Per Each	$18.00			$0.00
Mop Heads/ Per Each	$10.00			$0.00
Daily Hydratilon - Per Shift/Per Man	$15.00	3		$45.00
Tote/Drum vent and filter	$235.00			$0.00

Consumables Total $240.00

Subcontractors	**Cost**	**Markup**		**Extended**
		1.2		$0.00
		1.2		$0.00
		1.2		$0.00
		1.2		$0.00

Subcontractors Total $0.00

Disposal	**Price**	**How Many**		**Extended**
				$0.00

Disposal Total $0.00

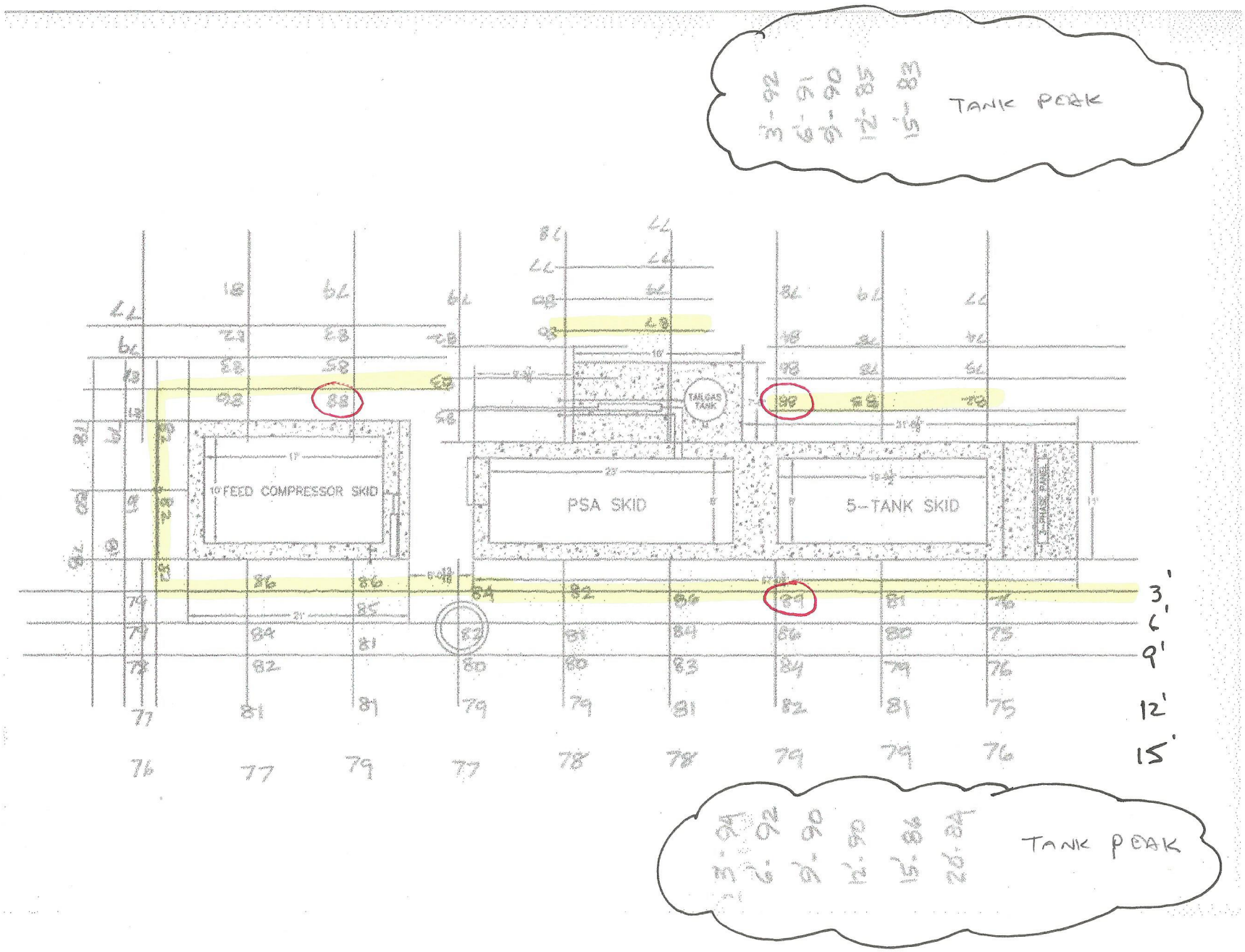
Subtotal Labor, Equipment, Consumables $13,522.00

Contingency (assumed to be zero) $0.00

Job Total $13,522.00

Approximate Total for 12-hr Shift = **$13,522**
TOTAL DAILY 24-HR CHARGE = **$27,044**

ATTACHMENT 14
PSA SOUND MEASUREMENTS


TANK PEAK
FEED COMPRESSOR SKID
PSA SKID
5-TANK SKID
TAIL GAS TANK
3'
6'
9'
12'
15'
TANK PEAK

ATTACHMENT 15
SPCC PLAN

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN
DOC. NO. MP-14
GREEN ERA RENEWABLE ENERGY & URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS 60620-1937

March 3, 2023

DAI Project # 7741

Prepared For:
Green Era 83rd Street, LLC
218 North Jefferson Street, Suite 300
Chicago, Illinois 60661-1307

Prepared By:
DAI Environmental, Inc.
27834 North Irma Lee Circle
Lake Forest, Illinois 60045-5130

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN
FOR
Green Era Renewable Energy & Urban Farming Campus
650 West 83rd Street
Chicago, Illinois 60620

Original Date of Plan: March **, 2023
Date of Last Plan Amendment/P.E. Certification: N/A
Date of Current Plan Amendment/P.E. Certification: TBD, 2023
(to be signed/certified upon completion of construction and improvements)

Designated person accountable for spill prevention:
Clemens Halene
Plant Manager

CERTIFICATION

I hereby certify that I (or my duly authorized representative) have examined the facility and attest that this Spill Prevention, Control, and Countermeasure (SPCC) Plan has been prepared in accordance with good engineering practices, including establishing procedures for required inspections and testing. The SPCC Plan and spill containment conform to all applicable regulations and will provide adequate protection for spills and slug loadings when used and maintained properly.

This certification in no way relieves the owner/operator of the duty to prepare and fully implement this SPCC Plan in accordance with the applicable requirements. This Plan is valid only to the extent that the facility owner or operator maintains, tests, and inspects equipment, containment, and other devices as prescribed in this Plan.

Professional Engineer Certification

Engineer: _____

Signature: _____

Registration Number: _____

Date: _____ SEAL

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN
MANAGEMENT APPROVAL & REVIEW PAGE

MANAGEMENT APPROVAL

Green Era 83rd Street, LLC is committed to the prevention of discharges to navigable waters and the environment. This Spill Prevention, Control, and Countermeasure Plan (SPCC) Plan will be appropriately implemented, including completing required inspections and testing, and performing regular review/update, as applicable.

Authorized Representative: Erika Allen Title: President

Signature: _____ Date: _____

MANAGEMENT REVIEW

A review and evaluation of this SPCC Plan is conducted periodically. If changes to the facility design, construction, operation, or maintenance occurs which materially affects the facility's potential for the discharge of into or upon the navigable waters of the United States or the stormwater sewer system, a recertification by a Professional Engineer will be conducted. Examples of such changes include increase/decrease in oil and/or hazardous material storage, addition/subtraction of secondary containment, and alteration of oil/hazardous material handling operations. Non-technical amendments (e.g. name/phone number changes or material storage changes where there is no increase/decrease) do not require the certification of a Professional Engineer.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1.0 FACILITY OWNER AND OPERATOR

1.1 Facility Owner, Address, and Telephone

Green Era 83rd Street, LLC
218 North Jefferson Street, Suite 300
Chicago, Illinois 60661-1307
Telephone: (708) 792-0649

1.2 Facility Operator, Address and Telephone

Green Era 83rd Street, LLC
218 North Jefferson Street, Suite 300
Chicago, Illinois 60661-1307
Contact: Erika Allen, President
Telephone: (708) 792-0649

Facility SIC Code:	4953
Facility NAICS Code:	562219
Latitude:	41° 44' 41.68" North
Longitude:	87° 38' 26.83" West
Location:	Township 38 North, Range 14 East, Section 33

2.0 DEFINITIONS AND REGULATORY CITATIONS

Under Article V, Section 4 of the Metropolitan Water Reclamation District of Greater Chicago (MWRD) *Sewage and Waste Control Ordinance*, "Each significant industrial user and each industrial user notified of applicability of this section…shall provide protection from accidental discharge to the sewerage system…each such industrial user must have detailed plans on file at the District showing facilities and operating procedures to provide this protection. Plans shall contain all elements required under 40 CFR 403.8(f)(2)(vi), which are:

> ***(A)*** *Description of discharge practices, including non-routine batch Discharges;*
>
> ***(B)*** *Description of stored chemicals;*
>
> ***(C)*** *Procedures for immediately notifying the POTW of Slug Discharges, including any Discharge that would violate a prohibition under § 403.5(b) with procedures for follow-up written notification within five days;*
>
> ***(D)*** *If necessary, procedures to prevent adverse impact from accidental spills, including inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site run-off, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants (including solvents), and/or measures and equipment for emergency response;*

Additionally, the MWRD has published an "Elements of a Slug Control Plan" document on their website that provides further guidance as to the required or recommended contents of a Slug Control Plan. These include:

> *B. Equipment to Contain Spills - Drainage and Secondary Containment (Absolute Requirements)*
> *1. No floor drains or other direct bypass to the sewer system may exist in wet manufacturing areas, wastewater pretreatment areas, or raw chemical/sludge storage areas which in the event of run-off spillage would result in a violation of any criteria of the Sewage and Waste Control Ordinance.*
> *2. Under those situations when floor drains are required by specific building codes or when the elimination of floor drains is not feasible, a detailed explanation of the prohibitive factors along with an acceptable alternative plan to prevent run-off spillage from entering the sewer system must be provided.*
> *3. Adequate secondary containment, such as but not limited to impervious diking, must be provided for all manufacturing, pretreatment operations and raw chemical/sludge storage areas identified by Item No. IV, B, 1.*
> *4. Impervious flooring with no direct drainage to the sewer system must be provided for all secondary containment areas.*
> *5. A minimum secondary containment capacity of 100% of the volume of the largest above ground process tank located in wet manufacturing areas which, in the event of run-off spillage, would result in a violation of any criteria of the Sewage and Waste Control Ordinance must be provided.*
> *6. A minimum secondary containment capacity of 100% of the volume of the largest above ground wastewater pretreatment system process tank which, in the event of run-off spillage, would result in a violation of any criteria of the Sewage and Waste Control Ordinance must be provided.*
> *7. A minimum secondary containment capacity of 100% of the maximum volume of each of the following: (a) stored chemicals, (b) production residues, (c) pretreatment sludge must be provided. Outside storage facilities must be covered to prevent stormwater from entering secondary containment areas.*
> *8. Supporting documentation pursuant to Item Nos. IV, B, 1 through 7 must be submitted. Said documentation must include written narratives, sketches, and engineering computations on tank sizing, worst-case scenario spill volumes and secondary containment capacities. Further, said documentation must be prepared by a professional engineer registered in the state of Illinois and must certify that the design and capacities of the secondary containment facilities will satisfy District requirements and provide adequate protection to prevent run-off spillage from entering the sewer system or waters under the jurisdiction of the District.*

As per the MWRD's Sewage and Waste Control Ordinance, "Plans shall be certified by a Registered Professional Engineer licensed by the state of Illinois." This plan is referred to as a Slug Control Plan (SCP), and the information required by MWRD in a SCP is effectively identical to the information to be included in a typical Spill Prevention Control and Countermeasure (SPCC) Plan as per USEPA regulations (where applicable).

Additionally, the Chicago Liquid Waste Handling Facility regulations, which are also applicable to the facility, require an SPCC Plan as per the following:

> *8.5.11. Spill Prevention and Control. [Section 11-4-1520(B)(4)] The operating plan shall include a Spill Prevention and Control Plan. This plan shall include, but not be limited to:*
>
> *8.5.11.1. Descriptions of the measures taken to prevent spills occurring at tanks, piping, pits, and treatment devices. This description shall include a schedule of routine inspections for leaks and spills.*
>
> *8.5.11.2. Descriptions of the measures taken to control a spill should one occur.*
>
> *8.5.11.3. A listing of the materials and equipment available on-site for use in controlling spills should one occur, including the location of the equipment within the facility.*
>
> *8.5.11.4. Descriptions of the procedures used to document and report the spill to the Department of Environment and other agencies.*
>
> *8.5.11.5. Descriptions of emergency procedures and evacuation plans for use in the event of an uncontrollable spill.*
>
> *8.5.11.6. A listing of all safety equipment available at the facility, including the location of the equipment within the facility.*

Given that secondary containment is a standard component of an SPCC plan, the Chicago Liquid Waste Handling facility rules regarding secondary containment are relevant to the SPCC plan, and are as follows:

> *8.4.22. Secondary Containment. [Section 11-4-1520(B)(5)] The design report shall contain sufficient documentation that secondary containment exists for all tanks, drum storage areas, tanker truck loading/unloading areas, liquid transfer points, pits, lagoons, impoundments, and similar liquid waste handling devices or storage systems or devices, and as necessary and appropriate, pumps and piping systems.*
>
> *11.8. Secondary Containment. Secondary Containment volume shall be equivalent to the volume of the largest tank plus precipitation from a 25 year, 24 hour rainfall event. The secondary containment installations shall allow for the complete removal of any spilled waste or other materials.*

This SPCC Plan has been developed to address the specified MWRD and City of Chicago requirements for an SCP.

3.0 FACILITY INFORMATION

3.1 Facility Operations

The property addressed as 650 West 83rd Street in Chicago and owned by Green Era Educational NFP will be operated as a food waste (solid and liquid) recycling (composting) facility (Green Era Renewable Energy and Urban Farming Campus). See Figure 1 for a topographical Site Location Map. The facility and associated equipment are owned and operated by Green Era 83rd Street, LLC. The facility will operate as a food waste recycling facility developed to create commercial compost and biomethane for injection into the local natural gas utility system. Two (2) forms of food-based waste are to be received: solid food waste and pumpable liquid commercial food waste. Solid food waste includes food waste from food processors (dairies, bakeries, potato chip plants, etc.), grocery stores, and restaurants, as well as bagged kitchen waste from neighborhood curbside collection programs and other packaged food waste (e.g., beverages or soup in cans, milk or juices in plastic jugs, bottles, or cartons, and single serving condiment packs). Pumpable commercial food waste includes whey, liquid ice cream mix, end of batch soups, and sauces and syrups. Fats, oils, and greases (FOG) collected from grease traps at restaurants and food processors will also be accepted. Wash waters from food product tanker trucks and food product railcars will also be accepted by the facility. After being separated and pulverized during pre-digestion processing steps, solid food waste will be mixed with liquid food waste to generate a slurry, which is then pumped into the Biomass Equalization Tank where the preliminary steps of anaerobic digestion process initiate.

The facility is located in the Auburn Park neighborhood of Chicago within an industrial area bound by residential neighborhoods. The facility is bound by undeveloped land (under contract for lease by Green Era) and an industrial building, then a ComEd substation to the north; by South Wallace Street, then Diamond Waste Recycling or a vacant lot used for truck parking to the east: by West 83rd Street, then a church or Mahalia Jackson Park to the south; and by Metra railroad tracks, then a residential neighborhood to the west. Figure 2 is an aerial view of the development property and surrounding area.

Physically, the nearest surface water to the facility is the Auburn Park Lagoon, located approximately 2,305-ft to the north-northeast. The nearest significant body of surface water is over 4-miles southeast of the facility through heavily developed urban landscape. Based upon the distance to surface water and the highly urban development, it is not reasonable to expect that spills from the facility could directly impact the nearest surface waters by overland flow. Rather, the potential impacts to surface waters from the facility would be by a release into the City of Chicago stormwater sewer systems, which ultimately discharges to the MWRD combined sewer system. The combined sewer system in the area of the facility flows to the MWRD Stickney Water Reclamation Plant (WRP), which discharges treated wastewater into the Chicago Sanitary and Ship Canal (CSSC), a man-made waterway that eventually discharges to the Des Plaines River. The Stickney WRP is located practically adjacent to the CSSC at approximately mile marker 316 (shortly downstream of the South Central Avenue bridge). Under a worst case discharge evaluation that assumes a release to the sewer system and a failure to capture the release in the sewers and/or at the Stickney WRP, a discharge from the facility could result in a discharge to navigable waters.

The approximately 8.905-acre property is a mixture of asphalt paved driveways/parking, buildings, and non-hardscape surface. Buildings on-site include the 35,000-ft^2 Processing Building, 5,600-ft^2 Compost Loading and Handling Building (Pole Barn), and approximately four (4) "hoop houses" (i.e., simple greenhouse structures) that will be used to perform indoor urban farming within the "Urban Agriculture Area." Areas without hardscape include the stormwater detention pond, the "Urban Agriculture Area," the community garden center, and various areas of general landscaping. Figure 3 provides a Site Plan with the drainage detail.

Solid food waste will arrive via compactors, roll-off boxes, and dump or walking floor trailers. Packaged food products will be delivered in box trucks. Tanker trucks will deliver pumpable food wastes. All transfer operations will be conducted inside the Processing Building, with the exception of palletized packaged food deliveries occurring at the single truck dock at the northeast end of the building. Liquid food waste is initially transferred into two (2) sub-grade concrete holding tanks (tanks fully encased in concrete and located in the building lower level) before being mixed with pulverized solid food waste and ultimately transferred to the first of two (2) aboveground storage tanks (ASTs) located outside to the north of the Processing Building.

Finished product commercial compost will be shipped off-site via trailer truck or utilized on-site in the urban farming area. Biomethane, a by-product of the anaerobic digestion process, will be distributed into the natural gas utility pipeline as a finished product.

In addition to the raw ingredient and finished products transferred and stored in association with the anaerobic digestion process, the facility will receive and store small quantities of various petroleum oils and chemicals. Oil (various) will be maintained in small volume (5-gallon pales) inside the Processing Building for subsequent use in processing equipment. Undiluted polymer (non-hazardous) will be received as a liquid emulsion (mineral oil) in 275-gallon totes and subsequently diluted in an AST for use in enhancing flocculation prior to the dewatering process. Ethylene glycol (glycol) will be used for a non-contact heat transfer liquid. Undiluted glycol totes will also be stored inside the Processing Building. Two (2) tanks service the heat exchange system with diluted (mixed with water) glycol. Figure 3A shows the locations of the tote storage and the polymer and glycol process tanks. Figure 3B is a detail of the processing building.

Three (3) additional sub-grade concrete tanks located in the lower level of the Processing Building were installed during building construction, tanks T-210A (14,000-gallons), T-210C (14,000-gallons), and T-251 (30,000-gallons). Tank T210-A is intended for the future storage of undiluted polymer, while the future use of the other two (2) tanks is to be determined based upon operational needs. Figure 3A shows the locations of these empty (i.e., currently non-regulated) tanks.

Other chemical storage on-site will include household cleaning supplies, paint products, and/or fuel in small volume containers (5-gallons or less) inside flammables cabinets within the maintenance area inside the Processing Building.

Municipal water intake will be utilized for domestic use (i.e., sinks, toilets, etc.), polymer makeup (for improved solids removal during post-digestion dewatering), and equipment/facility wash water. Four (4) operations conducted by the facility will account for the equipment/facility wash water generation:

- Dewatering belt press clean rinsing (post-digestion), the primary source of wastewater discharge from the facility;

- Wash down following unloading of food waste containers, and exteriors of trucks, and tankers;
- Rinsing of separated grit prior to transfer to garbage compactors (pre-digestion, thus conveyed to digester, not to discharge); and
- General housekeeping.

All City of Chicago water intake will discharge to the MWRD. Average discharge volume to the MWRD is expected to be 60,385-gallons/day. The excess volume (beyond the intake water) is the result of the imported liquid food waste, with the wastewater ultimately generated by the belt press dewatering step and stored in two (2) sub-grade concrete holding tanks prior to batch discharge via Outfall 1A under MWRD Discharge Authorization. The wastewater generated at the facility will be discharged to the MWRD without any pretreatment; the facility is not a categorical pretreatment facility.

Between two (2) and seven (7) personnel are expected to control operations at the facility. Operations will be controlled from the small office area inside the approximate middle of the Processing Building. Typical operations (i.e., when food waste is imported and preliminarily processed) will be from 7:00-17:00, Monday-Saturday. It is possible the facility may periodically operate on Sundays. However, the facility will be continuously monitored, with anaerobic digestion operations occurring 24-hrs/day, 7-days/wk.

3.2 Facility Storage

Oil Storage

The facility will maintain limited storage of various oils, including both petroleum and the polymer/mineral oil emulsion. Motor oil, hydraulic oil, and gear box oil (both new and used) on-site on the main floor of the southwestern portion of the Processing Building. Oil storage is maintained for equipment maintenance and is generally limited to 5-gallon buckets. Used oil generated during equipment maintenance will be placed into one (1) 55-gallon drum pending off-site shipment for disposal. The used oil drum will be maintained in the same area.

In addition to the small volume petroleum oil, polymer emulsion will be delivered in concentrated form in 275-gallon totes that will be maintained within the dewatering area of the Processing

Building. Initial polymer storage is expected to be limited to a single 275-gallon tote until full-scale operations are achieved. (Sub-grade concrete tank T-210A is anticipated to be utilized for future storage of undiluted polymer.) The concentrated emulsion will be diluted with water in a 2,000-gallon AST (T-210B), located on the main floor of the Processing Building. Tank T-210B is primarily water and is therefore not being considered as storing an oil.

Oil-filled equipment will also be located on-site. Two (2) pad-mounted transformers owned by ComEd containing mineral oil (with an assumed volume greater than 55-gallons) are located outside the northwest wall of the Processing Building and near the northern property boundary in same location as the gas upgrading equipment. (A pad is available for the installation of a third transformer adjacent to the unit outside the northwest wall of the Processing Building.) Process equipment located inside of the Processing Building utilized to handle the solid food waste as part of the pre-digestion steps is oil-filled, but the volumes are below the 55-gallon threshold.

The combined aboveground oil storage capacity will remain well below the 1,320-gallons threshold that triggers USEPA SPCC regulations (40 CFR 112). See Figures 3-3B for locations of oil storage.

Chemical Storage

Most chemical storage will be non-hazardous or unregulated small volume. The only hazardous liquid storage on-site relates to ethylene glycol to be used in the heat exchanger system. Storage is generally limited to no more than two (2) 275-gallon totes. Tote storage of undiluted ethylene glycol will be located on the main floor of the southern portion of the Processing Building. Additionally, two (2) tanks will be connected to the heat exchanger system, the 55-gallon diluted glycol tank (T-400A) and the 238-gallon expansion tank (T-400B). (The total system volume including piping has been calculated at 2,000-gallons.) Both tanks will be located in the boiler room on the main floor of the Processing Building. Spent glycol removed from the equipment will be placed into a 55-gallon drum pending off-site shipment for disposal. Total aboveground hazardous chemical storage capacity will be 898-gallons, including the two (2) tanks, two (2) 275-gallon totes, and a 55-gallon drum of ethylene glycol. The total glycol volume on-site including

what is stored and what is flowing through the system would be 2,605-gallons. Non-hazardous chemical storage is excluded. See Figure 3A for storage locations.

Liquid Waste Storage

In addition to oil and hazardous chemical storage on-site that is regulated by MWRD, this SPCC Plan covers "liquid waste" storage as regulated by the City of Chicago Liquid Waste facility requirements. Eight (8) tanks will be utilized across the various steps of the food waste composting process as described below.

Liquid food waste, FOGs, and rinse waters that will be accepted by the facility will be transferred into two (2) 30,000-gallon concrete holding tanks (T-050A and T-050B) located in the lower level of the Processing Building. From the holding tanks, the liquid food waste will be blended with pulverized solid food waste in the separation mill to create a slurry that is then transferred into the slope-bottom grit hopper with 5,500-gallon holding tank (T-065A). After allowing for the removal of grit, the slurry will be transferred to the 320,000-gallon Biomass Equalization Tank (T-100). Hydrolysis and acidification (initial steps of the anaerobic digestion process) begin in the Biomass Equalization Tank, breaking down the complex carbon chains into simple acids (e.g., acetic acid, butyric acid, and propionic acid). The anaerobic digestion process is then completed in the 1,680,000-gallon Digester Tank (T-105), altering the food waste slurry into a high-strength wastewater (referred to as digestate). Until future development on the property to the north provides the sufficient containment capacity for the maximum operating capacity plus freeboard of the 25-yr, 24-hr storm (5.7-in), the City of Chicago Liquid Waste Handling Facility Permit will limit the initial operating volume of the Digester Tank to 602,057-gallons, the secondary containment capacity currently available less the volume generated within the first 15-minutes of a 2-yr storm before high volume pumping response can be implemented.

From the Digester Tank, the digestate is transferred to a 30,000-gallon sub-grade concrete holding tank (T-205) located inside the lower level of the Processing Building prior to entering the dewatering step. The dewatering step generates the finished product commercial compost and wastewater (referred to as filtrate). Filtrate is temporarily stored in two (2) 30,000-gallon sub-grade

concrete holding tanks (T-250A and T-250B) for equalization, pending discharge to the MWRD. The characteristics of the digestate and the filtrate are summarized below:

		Digestate	Press Filtrate
Nominal Flowrate[1]	GPD_7	51,667	55,024
pH	SU	7.8 - 8.5	7.8 - 8.5
BOD (50% of COD)	mg/l		1,500 - 3,750
	lbs/day		688 - 1,721
COD	mg/l	30,000 - 55,000	3,000 - 7,500
	lbs/day	12,930 - 23,704	1,377 - 3,442
TKN	mg/l	3,000 - 6,000	2,000 - 5,000
	lbs/day	1,293 - 2,585	918 - 2,295
N as NH3	mg/l	2,000 - 4,000	1,500-3,500
	lbs/day	862 - 1,724	688 - 1,606
TP	mg/l	600 - 1,000	40 - 200
	lbs/day	259 - 431	18 - 92
TSS	mg/l	30,000 - 45,000	200 - 2,000
	lbs/day	12,930 - 19,395	92- 918
TDS	mg/l	2,000 - 10,000	2,000 - 10,000
	lbs/day	862 - 4,310	918 - 4,589
Alkalinity (4.6)	mg/l		3,000 - 8,000
	lbs/day		1,377 - 3,671

1. Flowrate stated for 7-day average volume when processing an average of 50,000 TPY SSO and 26,750 TPY FOG.

Total aboveground liquid waste storage in the eight (8) tanks is 2,155,500-gallons. Total initial storage with the restricted volume in the Digester Tank is 1,077,557-gallons See Figures 3-3B for locations of the liquid waste tanks.

3.3 Discharge Prevention and Control Measures

The facility will be observed daily during operations, with personnel present 24-hrs/day, 7-days/wk. Consistent with the requirements of the City of Chicago Liquid Waste regulations, formal facility inspections will be conducted daily in order to detect any abnormalities that may cause a problem. Records of these inspections will be documented and signed by the inspector. All drips and/or staining will be promptly reported so that arrangements can be made to have proper maintenance performed.

All liquid food waste will be received by the facility via tanker trucks (up to approximately 5,500-gallons capacity) for subsequent gravity distribution into the sub-grade holding tanks T-050A and T-050B. All subsequent liquid transfers will be via pump and piping. Tanker truck transfer operations to the holding tanks will be conducted inside the northern portion of the Processing Building and will be overseen by facility personnel. During transfer activities, drivers and facility personnel will take all necessary precautions to prevent a release. Established procedures will be strictly adhered to during transfers. In the event of a release, trench drains in the floor of the building within the tanker truck transfer station flow to sump pits, which subsequently drain to the liquid receiving tanks via sump pump. Even if the immediate trench drains are overwhelmed, any liquid release would flow into the lower level of the building and be recovered in the lower level trench drains and sump pits. The entire main floor and lower level of the Processing Building are concrete. All liquids removed from the sump pits will be transferred into the two (2) liquid food waste receiving tanks. In the event of a release, facility personnel will respond with applicable spill equipment, which will generally consist of simple tools (e.g., shovels, brooms, etc.) and water. For quick access, spill materials, including a 95-gallon spill kit, sorbent pads, and oil-dry will be located in the maintenance area. There is no threat of a release inside the building of reaching the sewer system.

Totes of chemical will be delivered to the facility on an as needed basis. Facility personnel will manually transfer oil from buckets to equipment during maintenance operations. The heat exchanger system will be replenished with glycol when necessary. Used oil and spent glycol removed from the equipment will be placed into a 55-gallon drum pending off-site shipment for disposal. All transfers will be conducted indoors by appropriately trained personnel. The oil and glycol drums will be stored inside the southwestern portion of the Processing Building pending removal by the facility's waste handler.

All liquid storage tanks at the facility are single-walled, constructed of carbon steel or concrete. All tanks are monitored by an automatic gauging system. The tanks will be continually monitored by the SCADA (supervisory control and data acquisition) system with automatic signal processing and alarming. Additionally, the large-volume ASTs have been designed with overflow piping that

connects to a 3,000-gallon underground sump pit. Daily visual observations of tanks and the facility will be performed in order to detect any abnormalities that may cause a problem.

Solid material transfers will also occur on-site, specifically food waste import, non-digestible material transfer from equipment to compactor boxes, and transfer of finished product compost from the dewatering belt press to trucks. Most of these transfers will be completed via auger or belt conveyor systems. Solid food waste will be generally tipped directly into the live-bottom receiving bunker. Occasionally materials will be staged on the main floor of the building pending subsequent transfer into the receiving bunker, only expected during peak import operations.

There have been no reportable spills at this facility as operations have not yet begun. Minor surficial releases in amounts less than reportable quantities are anticipated to occur periodically and will be immediately cleaned up by on-site personnel using spill supplies. Detailed controls and countermeasures are discussed throughout this SPCC Plan. Appropriate reporting and response measures are detailed within this SPCC Plan to address a slug discharge, should one occur.

3.4 Disposal of Recovered Liquids

In the event that a release of liquids occurs at this facility, Green Era will attempt to contain and recover as much of the spilled liquid as possible. The facility will maintain three (3) high-capacity, diesel powered pumps (1,250-gal/min capacity, each) on-site to aid in response and recovery efforts (though the use of these pumps is only expected to be necessary in the event of very large spill, such as a failure of the digester tank). When appropriate, materials will be stockpiled temporarily on-site until waste profiling and off-site disposal acceptance is obtained. If possible, collected material will be returned to the tank system for anaerobic digestion. When the material is considered a waste, transportation of the materials will be carried out using a licensed waste hauler and be disposed of at an approved location that is properly registered and permitted according to all local, state, and federal regulations. All applicable laws, rules, and regulations in disposing of the recovered liquid, cleanup materials, and contaminated soil will be followed.

3.5 Contact List

Name	Title	Telephone
Federal Number		
National Response Center		(800) 424-8802
USEPA Region 5		(312) 353-2318
State Notification Number		
Illinois Emergency Management Agency (State Emergency Response Commission)		(800) 782-7860
Illinois Environmental Protection Agency Office of Emergency Response		(217) 782-3637
Illinois Environmental Protection Agency Des Plaines Field Office		(847) 294-4400
Local Notification Number		
Chicago Office of Emergency Management and Communications (Local Emergency Planning Commission)		(312) 746-6430
Metropolitan Water Reclamation District (MWRD) (For a release into the sewer system)		(312) 787-3575 (24-hr) (312) 751-3044 (daytime)

Name	Title	Telephone
Chicago Fire Department/Police Department		911
Green Era		
Clemens Halene	Plant Manager	(708) 792-0649 (330) 601-4160 (24-hr)
Ned Mast	Plant Engineer	(708) 792-0649 (330) 465-9132 (24-hr)
Green Era (Administrative)		
Erika Allen	President	(312) 735-4833 (24-hr)
Jason Feldman	Director	(773) 710-2204 (24-hr)
Spill Response Organization		
SET Environmental, Inc.		(877) 437-7455 (24-hr)
Environmental Consultant		
Richard J. Vamos, DAI Environmental, Inc.		(847) 343-4257 (cell)

4.0 SPILL REPORTING AND RESPONSE

The Green Era facility does not store greater than 1,000,000-gallons of oil or extremely hazardous substances in excess of a threshold planning quantity such that the completion of a Facility Response Plan (40 CFR 112.20) or an Emergency Response Plan is required. In general, in the event of a release, personnel are instructed to shut-off the source of the spill, if possible, and use spill control equipment to contain the release as best as possible. Spill supplies, including a 95-gallon spill kit, sorbent pads, and oil-dry, will be located in the maintenance area. Visible discharges are promptly addressed and are removed as soon as possible. If necessary, an outside contractor will be called in to assist in cleanup and disposal of waste materials. Appendix A provides SOP-21-001: *Spill Contingency Plan* with spill response and reporting procedures. Appendix B provides SOP-21-002: *Standard Operating Procedure Sewer Spill Prevention and Reporting*, which includes established procedures to be followed in the event of a release to the MWRD sewer system (the SOP together with the SPCC address the SCP requirements). Appendix C includes SOP-21-009: *Standard Operating Procedure Catastrophic Spill Containment Plan*, which discusses spill containment/response to a major release of 50,000-gallons or greater.

As soon as safe and possible, personnel must perform the required notifications. The Plant Manager (or appropriately qualified alternate contact) is to be notified of a measurable spill as soon as possible. A listing of emergency contact numbers is included previously in Section 3.5. Illinois reporting requirements are included in Appendix D. An example discharge notification form is also included in Appendix D. The form includes all information required while notifying the designated authority of a reportable release. Tables of quantities for reportable releases are provided in 40 CFR 117.3 and 40 CFR 302.4. Minimum quantities for mandatory reporting of spills have been established by the State of Illinois as detailed on the spill reporting guidance obtained from the Illinois Emergency Management Agency and included in Appendix D. Petroleum spills in excess of 25-gallons or any volume of oil or hazardous liquid that may potentially impact waters of the state (either surface water or groundwater), must be reported. Any discharge of oil or hazardous material into the sewer system must be reported to MWRD within 24-hrs and followed up with a written description of the incident within 5-days of the incident.

In the event that the facility has discharged more than 1,000-gallons of oil in a single discharge or more than 42-gallons of oil in each of two (2) discharges within any 12-month period, submit the following information to the USEPA Regional Administrator within 60-days from the date of discharge: 1) name of the facility; 2) your name; 3) location of the facility; 4) maximum storage/handling capacity of the facility and normal daily throughput; 5) corrective actions/countermeasures taken, including a description of equipment repairs and replacements; 6) adequate description of the facility, including maps, flow diagrams, and topographical maps, as necessary; 7) cause of such discharge, including a failure analysis of the system or subsystem in which the failure occurred; 8) additional preventive measures taken or contemplated to minimize the possibility of recurrence; and 9) other information as the USEPA Regional Administrator may reasonably require pertinent to the SPCC or discharge. A form included in Appendix D provides a template for submitting this information.

5.0 POTENTIAL SPILL SOURCES

5.1 Aboveground Storage Tanks and Associated Equipment/Material

Below is a listing of all facility bulk storage tanks, capacity and contents, direction of flow, and form of spill containment.

Chemical

Tank #	Material Stored	Volume (Gallons)	Flow Direction	Containment
T-400A	Ethylene glycol	55	Spread laterally within Processing Building boiler room	Inside Processing Building
T-400B	Ethylene glycol	238		

Subtotal (chemical): 288-gallons

Liquid Waste

Tank #	Material Stored	Volume (Gallons)	Flow Direction	Containment
T-050A	Liquid food waste/FOG/ rinse water	30,000	Spread laterally within Processing Building lower level	Inside Processing Building lower level with full concrete walls and floor
T-050B	Liquid food waste/FOG/ rinse water	30,000		
T-065A	Food waste slurry	5,500		
T-100	Food waste slurry	320,000	Spread laterally overland (S) with engineered flow towards sewers that drain into the stormwater detention pond	Stormwater detention pond (closed outfall) and prompt spill response
T-105	Digestate (Wastewater)	1,680,000 (602,057 initial restriction)		
T-205	Digestate (Wastewater)	30,000	Spread laterally within Processing Building lower level	Inside Processing Building lower level with full concrete walls and floor
T-250A	Filtrate (Wastewater)	30,000		
T-250B	Filtrate (Wastewaster)	30,000		

Subtotal (food waste): 385,500-gallons
Subtotal (wastewater): 1,770,000-gallons (692,057-gallons with initial restriction)

Non-regulated/Empty

Tank #	Material Stored	Volume (Gallons)	Flow Direction	Containment
T-210A	Empty	14,000	Not Applicable	Inside Processing Building lower level with full concrete walls and floor
T-210B	Water (with diluted polymer)	2,000	Spread laterally within Processing Building towards trench drain	
T-210C	Empty	14,000	Not Applicable	
T-251	Empty	30,000		

Total (non-regulated): 2,000-gallons
Total (empty): 58,000-gallons

The ASTs at the facility will be compatible with contents: liquid food waste, digestate or filtrate (wastewater), and ethylene glycol. Tanks will have overfill protection via automatic gauging system. Additionally, the large-volume ASTs have been designed with overflow piping that connects to a 3,000-gallon underground sump pit. Potential sources of spills from these storage tanks include leaks from holes or deterioration, tank overfill, and complete tank failure and rupture. In the event of a complete failure, most tanks are located inside of the Processing Building, either in the full concrete wall and floor lower level (6), or in the concrete slab floor and walls boiler room (2). Spills would spread laterally across the concrete floor of the building, likely dropping into trench drains that flow into concrete sump pits. No open floor drains are located in the building that directly connect to the sanitary sewer. Spills from the two (2) outside tanks will flow laterally overland with engineered grading of the facility, with spills directed toward on-site catch basins that drain to the stormwater detention pond located at the southeast corner of the facility. A portion of the release volume would be expected to infiltrate into surrounding unpaved ground. Flow to the north is restricted by a combination of soil berm and concrete barriers. (Future flow will be intentionally directed to the north into a retention basin designed to provide adequate secondary containment.)

In addition to the ASTs, the valves, pumps, and pipes utilized for liquid transfer pose a potential spill source. Pumps and pipes will be used to move liquid to and from storage tanks. Potential sources of spills from this equipment include leaks (primarily at connection points and seals), spillage from connections, and pipes bursting. Negligence during transfer operations also represents a potential for incident. Flow direction in the event of a spill will be laterally within the

building (indoor piping) or consistent with the engineered drainage towards on-site storm sewers (outdoor piping).

5.2 Other Potential Sources

There are other potential spill sources on-site. Tanker truck transfer of liquid food waste into the receiving tanks will occur within the northern portion of the Processing Building. Negligence or undetected leaks may cause a release during transfer operations. Potential sources of spills include drips from pipe/hose connection points or rupture. Additionally, tanker trucks pose a threat of release via leak or rupture. In the event of a spill occurring at tanker truck transfer area, liquid food waste would spread laterally across the concrete floor of the building towards trench drains and/or into the lower level of the Processing Building.

There are two (2) oil-filled transformers located outside the west wall of the Processing Building (1) and along the northern boundary of the facility (1). The pad-mounted transformers are owned by the electrical utility. Lack of attention and proper maintenance of this oil-filled equipment could result in a release. The direction of flow for the transformers depends on the location, but will general be laterally on-site and with limited spread.

Finally, totes, drums, and small volume containers of oil, polymer/mineral oil emulsion, and chemicals will be located inside the Processing Building. Spills or leaks may occur as a result of damage, deterioration, or vandalism, although the volume of a release would be less than an AST release. A spill would spread laterally across the concrete floor of the building, likely dropping into trench drains that flow into concrete sump pits or into the building lower level. No open floor drains are located in the building that directly connect to the sanitary sewer.

6.0 PREVENTION MEASURES PROVIDED

6.1 Aboveground Storage Tanks and Associated Equipment

To meet the requirements for secondary containment, most storage tanks at the facility are located inside of the Processing Building. The building has a lower level with cast-in-place concrete walls and floor. No trench or floor drains within the processing areas of the building are connected to sanitary sewers. The stormwater sump in the northwest basement floor is sealed closed, preventing any material spilled into the basement from subsequently pumping out of the building into the on-site stormwater sewer system. The main floor of the building is concrete slab and building walls are pre-cast concrete construction. Most pumps, piping, and other appurtenances will also be located inside. For small spills and leaks, emergency spill supplies will be located in the maintenance area. In the event of a large release, the facility's emergency response contractor will be called upon to assist in the cleanup and recovery operations.

As presently constructed, the facility does not have the ability to provide secondary containment capable of managing of managing a catastrophic release: the full 1,680,000-gallons capacity of the Digester Tank and the additionally required freeboard of the 25-yr, 24-hr storm (5.7-in). Therefore, the property to the north of the facility has been leased with the intent to allow for the design and build of appropriately sized secondary containment. Until such time as the full secondary containment is in-place, the Digester Tank operating volume is limited by the City of Chicago Liquid Waste Handling Facility permit to a maximum of 602,057-gallons. Secondary containment for this volume is provided by a combination of designed surface flow towards on-site sewers that drain into the stormwater detention basin (combined capacity of 681,430-gallons) and rapid response with three (1) 1,250-GPM pumps that will be used to transfer spilled material into the basement of the Processing Building (647,035-gallons) and empty sub-grade concrete storage tanks (additional 65,743-gallons). To ensure that the detention pond will act as a temporary retention basin in the event of a significant release, a normally-open plug valve will be closed, preventing release from the pond into the sewer system (i.e., no slug discharge). The plug-valve will not be re-opened until the release is contained and response operations have been implemented to prevent a significant release of material into the sewer system. Detailed discussion of the currently available secondary containment is provided in Section 16.2. See Appendix E for

engineering calculations establishing the available containment and Digester Tank restriction volume.

6.2 Other Potential Sources

There is only one (1) liquid transfer area at the facility, and the station is located inside of the northern portion of the Processing Building. Containment of the tanker truck transfer operations is provided by the building structure with concrete walls and floor. The trench drains in the transfer area flow to concrete sump pits that subsequently direct liquids into the liquid receiving tanks flow via sump pump. There are no direct connections from the transfer area to sanitary sewers. Therefore, the transfer area is fully contained. A slug discharge to the MWRD is not considered a possibility from transfer operations. Spill supplies will be utilized to clean floors in the event of a spill.

The utility-owned oil-filled transformers do not have a form of containment other than cautious oversight by facility personnel during daily inspections. The newly installed transformers are not expected to be a likely source of release, and the mineral oil volume that could be released would be expected to only impact on-site property; no off-site flow or discharge to the MWRD sewer system should occur. Facility personnel will deploy spill supplies in the event that oil is observed to be leaking from the units during facility inspections, and the utility will be promptly notified so repair or replacement can be performed. Cautious oversight and prompt response using available equipment on-site to block and/or absorb a spill will serve as the containment for transformers.

All drums/totes are stored inside. The storage inside a concrete wall and floor building provides full secondary containment. There is no floor drains that would allow for a release to the sewers. Spill supplies will be located in the maintenance area for use in quick response, if necessary.

7.0 IMPRACTICABILITY CONSIDERATIONS

No impracticability considerations are considered for this facility.

8.0 INSPECTIONS/RECORD KEEPING

Daily inspection will be conducted by facility personnel during operating hours as required by Chicago Liquid Waste regulations. Daily inspection will be performed to identify signs of malfunctions, leaks/spills, deterioration/corrosion, cracks/damage, or other signs of potential concern for tanks, piping, and secondary containment. Daily inspections will be documented on the *Daily Tank Inspection Log* and *Daily Secondary Containment Checklist* forms (see Appendix F). In addition to daily inspections, formal monthly (at a minimum) inspections of the entire facility, tanks, equipment, etc. will also be performed to identify deterioration, malfunctions, and possible leaks. The inspections include: tank shell, supports, foundations, fittings, pumps, valves, pipes/hoses, and other equipment; bulk containers and associated storage areas; oil-filled transformers; containment structures; spill supplies; and transfer areas. The inspections will be recorded on the *Monthly Facility Inspection Log* form and signed by the inspector (see Appendix F). Any abnormalities, leaks, corrosion, and/or signs of damage will be recorded and reported. Repairs or modifications will be performed promptly. As required, copies of the completed inspection forms will be maintained in the same location as the SPCC Plan for at least 3-years.

9.0 PERSONNEL TRAINING AND SPILL PREVENTION PROCEDURES

The person accountable for spill prevention at the facility will be the Clemens Halene, Plant Manager. The facility provides the following minimum training to oil-handling personnel prior to assignment of job responsibilities:

- General facility operations;
- Operation and maintenance of equipment to prevent discharges;
- Proper handling and spill prevention procedures;
- Oil/hazardous material discharge procedure protocols;
- Spill equipment use;
- General knowledge of oil/hazardous material characteristics;
- Understanding of causes for concern regarding spills, particularly into bodies of water;
- Applicable spill prevention and pollution control (State & Federal) laws, rules, and regulations; and
- The contents of the facility SPCC Plan

A log with the signatures of personnel who have reviewed this SPCC will be maintained at the facility. An example SPCC annual review form is provided in Appendix G. Appendix G includes a log sheet to document the oil-handling employees that have received the appropriate training.

In addition to preliminary training, refresher training for spill response will be conducted once a year, and deployment exercises for spill response will be periodically performed. Employees will also be briefed on the SPCC Plan at least once a year during a safety and environmental meeting. During this meeting, all personnel will be briefed on the purpose and scope of the SPCC, and any questions regarding the SPCC Plan and responsibilities associated with it will be answered. These briefings include discussions of potential discharges or component failures and precautionary measures. Any near misses or incidents will be discussed in these briefings in order to prevent them from recurring. Employee feedback and recommendations will be encouraged in spill prevention and operation. Additionally, notification protocols, equipment deployment and testing (spill cleanup and dispersion prevention materials), and emergency exercises for spill response will be discussed. Sign-in sheets (which include the topics of discussion at each meeting) for the annual discharge prevention meeting are included in Appendix G. Appendix G also includes a log for documenting annual refresher training and response equipment deployment/testing. Training records will be kept on file for a minimum of 3-years.

10.0 SITE SECURITY

The facility is being built in the Auburn Gresham neighborhood of Chicago. The area is a mixture of residential, commercial, and industrial properties. Typical operations (i.e., when food waste is imported and preliminarily processed) will be from 7:00-17:00, Monday-Saturday. It is possible the facility may periodically operate on Sundays. However, with anaerobic digestion operations occurring in the digester tank constantly, the facility will be continuously monitored, (24-hrs/day, 7-days/wk). Additionally, the facility is surrounded by fencing on three (3) sides, with the western property boundary being the concrete retaining wall of the adjacent railroad tracks. Adequate lighting is being installed to discourage and easily identify vandalism or other security concerns. Identification signage will be installed at both entrance/exit drives, the eastern off South Wallace Street and the southern off West 83rd Street.

11.0 TRUCK/RAIL LOADING RACKS

11.1 Drainage Control

Only one (1) liquid transfer area exists inside the building. The tanker truck transfer area does not meet the definition of a rack. Loading/unloading procedures meet the requirements and regulations of the United States Department of Transportation (DOT). Minor leaks may be controlled by placing drip pans under the leak. Cautious oversight and prompt response using available spill equipment on-site will also be instituted to minimize the impact of a release, though any release will be fully contained by the building structure. Green Era's emergency response contractor will be called upon to assist in the cleanup and removal of spills as needed.

11.2 Prevention of Spills Associated with Filling and Departure

Pumpable food wastes will be unloaded into two (2) 30,000-gallon holding tanks (T-050A and T-050B) located in the lower level of the Processing Building via gravity discharge from tanker trucks located on the main floor of the north end of the Processing Building. Transfers will be continuously observed by facility personnel. Personnel will be present to detect leakage or equipment malfunction and respond with spill supplies, as necessary. Drivers must comply with DOT regulations in 49 CFR 177.

12.0 REPAIR/ALTERATION OF FIELD CONSTRUCTED TANKS

There are two (2) field constructed tanks at this facility, the Biomass Equalization Tank (T-100) and the Digester Tank (T-105). As a best management practices, if these tanks are repaired, altered, or undergo a change of service, an evaluation of the increased risk of discharge due to brittle fracture will be completed prior placing the AST back into service. If an increased risk is determined, the tank will be inspected for risk of brittle fracture. Any increased risk will be mitigated before the tank is put back into service.

13.0 OTHER DISCHARGE PREVENTION

The facility is subject to both MWRD and Chicago Liquid Waste Handling Facility permit requirements. If the liquid food waste is considered by a regulatory agency as meeting the USEPA/USCG definition of "oil" per 40 CFR 112.2, then the facility will be required to meet USEPA SPCC regulations of 40 CFR 112.7 and 112.8/112.12.

14.0 QUALIFIED OIL-FILLED EQUIPMENT

The facility includes stationary oil-filled equipment in the form of transformers. There are two (2) oil-filled transformers located on-site, both pad-mounted units that are owned by ComEd. There are no specific safeguards in place for the transformers. However, cautious oversight of the transformers aids in the control and mitigation of a potential spill. Facility personnel can will quickly deploy spill supplies in the event that oil is observed to be leaking from a transformer unit and ComEd will be promptly contacted to handle the required repairs and/or replacement of transformers. Any spill from a transformer is expected to be of a volume that will remain on-site and of limited extent. All oil-filled process equipment on-site have oil reservoirs with capacity less than 55-gallons and are located inside the Processing Building.

15.0 FACILITY DRAINAGE

15.1 Facility Drainage from Diked Areas

There are no diked areas at the facility that are exposed to precipitation.

15.2 Facility Drainage from Undiked Areas

The areas of the facility with a threat of release that are undiked are the primary ASTs and the transformers. Flow from these areas will direct to the on-site stormwater detention basin via engineered grading and on-site sewer systems, as well as a diversionary berm (earthen and concrete barriers) installed along the northern property boundary. Future modifications to the facility will direct flow from these areas to a retention basin to the north, but details of the current facility design/surface flow are discussed in detail in Section 16.2 below.

15.3 Facility Drainage Treatment

No pretreatment of the wastewater (i.e., the filtrate) is expected to be conducted or necessary. There is no wastewater treatment system in use at the facility.

16.0 BULK STORAGE TANKS

16.1 Bulk Storage Container Construction

All liquid storage tanks at the facility are single-walled, constructed of carbon steel or concrete. All tanks are made of materials compatible with their contents: liquid food waste, digestate or filtrate (wastewater), and ethylene glycol.

16.2 Bulk Storage Secondary Containment

As discussed in Section 6.1, compliance with secondary containment requirements is met for most storage tanks at the facility by being located inside of the Processing Building. The building has concrete walls and floor, and no open trench or floor drains in the building are directly connected to the sanitary sewer system. All trench drains and sumps within liquid storage areas direct captured liquids back to the two (2) liquid receiving tanks. Additionally, the stormwater sump in the northwest basement floor is sealed closed, preventing any material spilled into the basement from subsequently pumping out of the building into the on-site stormwater sewer system.

Engineering design work is presently being performed to develop an appropriately sized secondary containment sufficient to manage the catastrophic release of the full 1,680,000-gallons capacity of the Digester Tank and the additionally required freeboard of the 25-yr, 24-hr storm (5.7-in). Until complete secondary containment capacity is available, the Digester Tank is restricted by the City of Chicago Liquid Waste Handling Facility Permit to a volume of 602,057-gallons, which was approved based upon the presently available secondary containment provided by the on-site stormwater detention basin (656,692-gallons) plus the on-site sewer system (24,738-gallons) minus 79,373-gallons of precipitation generated within the first 15-minutes of a 2-yr storm (after which high volume recovery efforts can be initiated). The detention basin has the volumetric capacity to hold the entire volume of the Biomass Equalization Tank (320,000-gallons).

The engineered grading of the facility in combination with a diversionary berm installed along the northern property boundary ensure that release from either of the outdoor storage tanks flows to the east and south, either overland into the on-site detention basin or into on-site sewers that drain to the detention basin, preventing a significant release of this type from flowing off-site. The adjacent elevated railway will prevent any westerly flow of a release. Based upon the topographic map developed for the facility and the presence of the on-site sewers, easterly flow will be limited to areas on-site (i.e. no off-site impact). (The diversionary berm to the north will be removed as part of the full-capacity secondary containment basing being designed for construction on the property to the north.)

In the event of a large volume release, a normally-open plug valve will be closed, temporarily converting the detention pond into a retention basin that will prevent a release from the pond into the sewer system (i.e., no slug discharge). The engineered grading of the facility in combination with a diversionary berm installed along the northern property boundary ensure that release from either of the outdoor storage tanks flows to the east and south, either overland into the on-site detention basin or into on-site sewers that drain to the detention basin. The adjacent elevated railway will prevent any westerly flow of a release. The diversionary berm to the north will be removed as part of the full-capacity secondary containment basing being designed for construction on the property to the north.

The plug-valve will not be re-opened until the full volume released is pumped from the pond and on-site sewer system into the basement of the Processing Building (647,035-gallons capacity) and spare sub-grade concrete storage tanks (additional 65,743-gallons). The combined capacity of the basement and spare tanks is 712,778-gallons, capable of holding 100% of the restricted capacity plus the 79,373-gallons of precipitation, with an excess capacity of 31,348-gallons. The transfer of the spilled material into the basement will be accomplished using three (3) diesel powered 1,250-GPM pumps (total capacity of 3,750-GPM) that will be maintained on-site at all times.

In addition to the high volume pumping capacity, spill response supplies are maintained on-site for use in smaller volume spills. Spill equipment includes simple tools (e.g., shovels, brooms, etc.), a 95-gallon spill kit, sorbent pads, and oil-dry. The spill materials are located in the maintenance

area for quick access. In the event of a larger spill, additional assistance will be obtained from the spill response contractor.

16.3 Secondary Containment Drainage

As previously noted, there is no diking at the facility exposed to precipitation. The detention basin that will serve as a secondary containment structure is affixed with a normally-open plug valve on the discharge piping, which allows for discharge of non-impacted stormwater into the combined sewer system during normal operating conditions. In the event of a release, the plug valve will be automatically closed to prevent an uncontrolled release (i.e., slug discharge) of non-stormwater into the sewer system.

16.4 Underground Storage Tanks

There are no underground storage tanks or partially buried tanks at this facility.

16.5 Aboveground Storage Tanks Testing and Leak Prevention

The external surface of each tank will be frequently observed by operating personnel, and facility personnel perform daily and monthly inspections of the ASTs and bulk storage containers to identify signs of deterioration. Any leaks, drips, or other malfunctions will be noted on inspection forms. Repairs or modifications will be performed immediately, if necessary.

Tanks covered under the manufacturer's warranty do not require integrity testing provided that the tank is intact and free of damage. Absent a warranty, formal integrity testing should be performed by a certified inspector per appropriate protocol to monitor for damage, corrosion, or other deterioration not easily identifiable during general visual tank inspection by facility personnel. Industry standard protocols for tank inspection include American Petroleum Institute (API) 653 (can be applied to water/wastewater storage), Steel Tank Institute (STI) SP001, or the applicable America Water Works Association (AWWA) manual of practice. Integrity testing generally includes visual integrity inspection (internal and external); single-walled tanks are often additionally inspected by non-destructive means (e.g., hydrostatic, radiographic, ultrasonic, and/or acoustic testing). Inspection standards and results dictate the interval between inspections. A file will be maintained for each tank inspected that includes the inspection reports, as well as repair

and modification information. Comparison records will be maintained for two (2) tests at a minimum.

The two (2) outdoor tanks will be equipped with internal heating loops for non-contact heat transfer. The tanks and heat transfer system will be new and unlikely to be a concern of failure. However, the glycol return from the tanks to the running heat transfer system will be monitored for signs of leakage that requires repair. All ASTs will be grounded. All tanks will be equipped with automatic gauging and continually monitored by the SCADA system with automatic signal processing and alarming. Additionally, the large-volume ASTs have been built with overflow piping that connects to a 3,000-gallon sump tank. Engineered controls will be regularly inspected/tested to ensure proper functioning.

16.6 Portable Storage Tanks

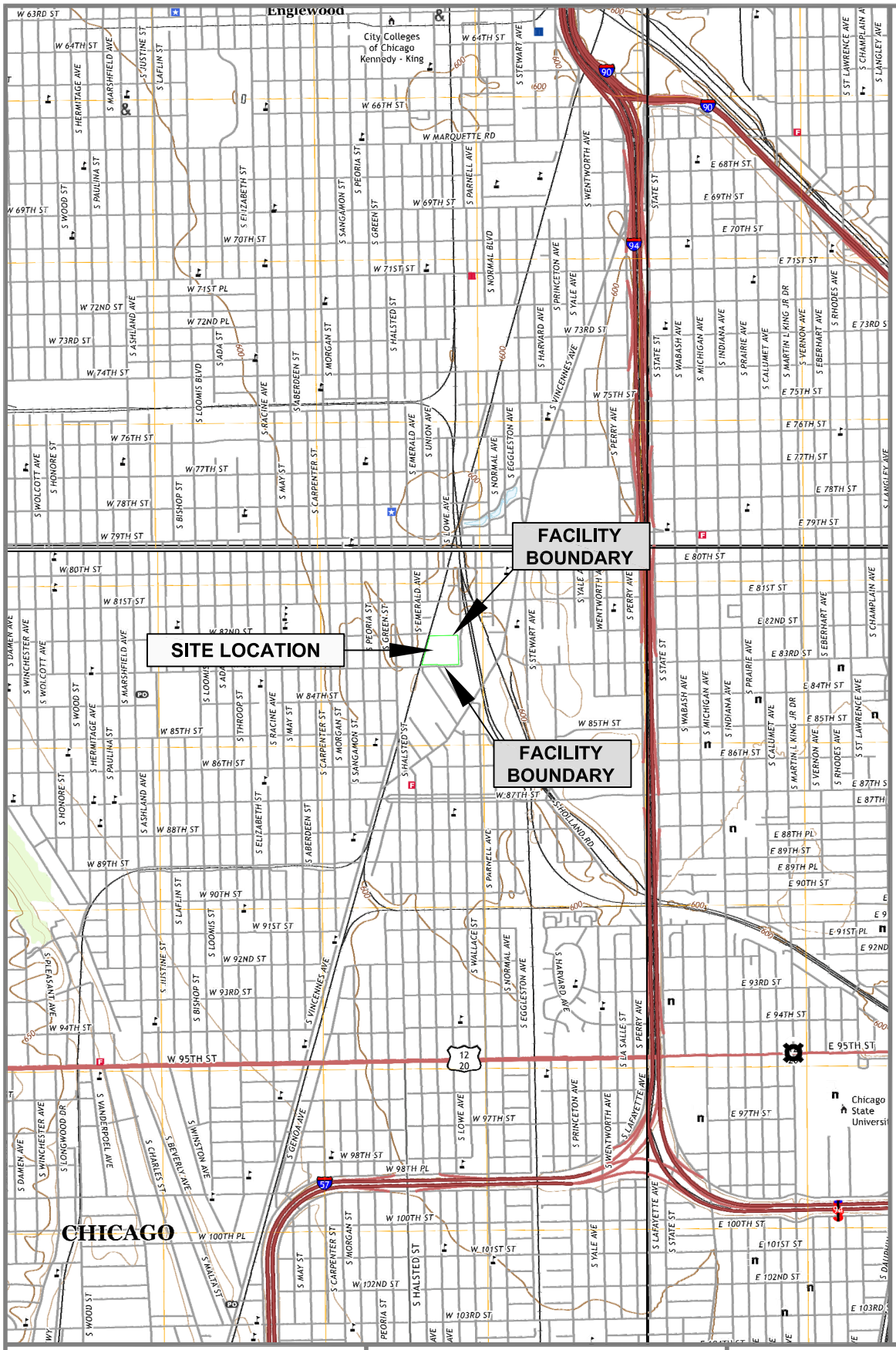
There will be drums/totes and other small volume containers of oil, polymer emulsion, and chemical stored inside the Processing Building. All drums/totes will be stored inside. The storage inside a concrete wall and floor building provides full secondary containment. There are no floor drains that would allow for a release to the sewers. Spill supplies will be located in the maintenance area for use in quick response, if necessary.

17.0 FACILITY TRANSFER OPERATIONS

Some underground piping associated with the anaerobic digestion process exists between the Processing Building and the outdoor tanks. All underground piping is coated. The piping is not wrapped or cathodically protected but is bedded in a non-corrosive stone backfill. Currently no piping is in standby service. Any pipeline that enters standby service will be blank-flanged and marked. Pipe supports were designed to minimize abrasion and corrosion. The supports allow for thermal expansion and contraction of the supported pipelines. Most aboveground pipelines at the facility will be inside, and all piping will be inspected daily and monthly. Any irregularities will be noted on inspection forms and corrected immediately by on-site maintenance personnel. Additionally, formal piping inspections by a certified inspector may be performed on aboveground piping following API 570 standards. Formal piping inspections typically include collection of

thickness measurements to determine corrosion rate and remaining life. There is no piping located in areas where vehicle traffic exists. All aboveground piping will be sufficiently protected.

FIGURES



LEGEND

APPROXIMATE SITE PROPERTY BOUNDARY

BLUE ISLAND & ENGLEWOOD QUADRANGLES ILLINOIS-COOK CO.

AND

JACKSON PARK & AND LAKE CALUMET QUADRANGLES ILLINOIS-INDIANA 7.5-MINUTE SERIES (2021 TOPOGRAPHIC)

N

0' 3,000'

S C A L E

CAD FILE: 7741-01B

REVISED: 09/09/21

DAI ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 1
SITE LOCATION MAP

LEGEND

PROPERTY BOUNDARY OF COMPOSTING FACILITY

ANAEROBIC DIGESTION PROCESS ABOVEGROUND STORAGE TANK

N

0' 300'

S C A L E

CAD FILE: 7741-14B

REVISED: 01/31/23

DAI ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 2
AERIAL VIEW OF SITE AND SURROUNDING PROPERTY USAGE
(MAY 2021 AERIAL TAKEN GOOGLE MAPS)

AABBITT ADHESIVES, INC.

WEST 82ND STREET

SOUTH EMERALD AVENUE

RESIDENTIAL

RESIDENTIAL

RESIDENTIAL BOUNDARY

RESIDENTIAL

METRA

REGULATOR & GAS UTILITY CONNECTION

FACILITY BOUNDARY

WATER TOWER

T-105 DIGESTER AST (1,680,000-GAL)

T-100 BIOMASS EQUALIZATION AST (320,000-GAL)

3,000-GAL UNDERGROUND OVERFLOW SUMP

MCC

METER

COMP

REG

GC

PSA

BIOGAS UPGRADE EQUIPMENT SKIDS

COMPOST LOADING & HANDLING BUILDING (POLE BARN) (TEMPORARY INDOOR MATERIAL STOCKPILING)

SIGN LOCATION

SOUTH WALLACE STREET

DIAMOND WASTE & RECYCLING

UNION PACIFIC RAILWAY

THERMAL OXIDIZER

FLARE BURNER

PROCESSING BUILDING

LOWER LEVEL

ELEC

BLOWERS & UTILITY ROOM

IONIZER CABINET

CONDENSATE DRAIN

HVAC STACK

OFFSET PATH

MUNICIPAL DUMPSTER ENCLOSURE

PROCESS WASTEWATER DISCHARGE FROM BUILDING

SANITARY WASTEWATER DISCHARGE FROM BUILDING

COMBINED PROCESS AND SANITARY WASTEWATER

PARKING (9 SPACES)

PARKING (3 SPACES)

PARKING (7 SPACES)

VEGETATION

HOOP HOUSE (INDOOR FARMING)

HOOP HOUSE (INDOOR FARMING)

HOOP HOUSE (INDOOR FARMING)

HOOP HOUSE (INDOOR FARMING)

URBAN AGRICULTURE AREA

STORMWATER POND (659,647-GAL)

HWL=13.00

COMMUNITY GARDEN CENTER

FACILITY BOUNDARY

SIGN LOCATION

FINAL MANHOLE

VALVE BOX

SAMPLING & METERING MANHOLE (OUTFALL 1A)

CONNECTION TO 45-INCH SEWER LINE BELOW STREET

CONNECTION TO 45-INCH SEWER LINE BELOW STREET

TRUCK TRAILER PARKING

WEST 83RD STREET

UNDEVELOPED

CHURCH

MAHALIA JACKSON PARK

LEGEND

- PROPERTY BOUNDARY OF COMPOSTING FACILITY (8.095-ACRES)
- RAILROAD TRACKS
- GAS UTILITY
- BIOGAS/BIOMETHANE/TAIL GAS PIPING
- WATER UTILITY
- STORM SEWER
- SANITARY SEWER
- MWRD COMBINED SEWER (OFF-SITE)
- T — ELECTRICAL TRANSFORMER
- FENCING (6-FT HIGH)
- ASPHALT PAVING
- GRAVEL COVERING
- ON-SITE TOPOGRAPHIC CONTOUR LINE (CITY OF CHICAGO DATUM)
- SURFACE FLOW DIRECTION
- TANKER TRUCK TRANSFER AREA
- SPILL SUPPLIES (COMM. EQUIPMENT ON PERSONNEL AND IN PROCESSING BUILDING)

NOTE: DISCHARGE SAMPLING (I.E., OUTFALL 1A) TO BE PERFORMED AT METERING MANHOLE INSTEAD OF FINAL ON-SITE MANHOLE; METERING MANHOLE REPRESENTATIVE OF COMBINED FACILITY DISCHARGE, INCLUDING SANITARY DISCHARGE)

N

0' 100'

S C A L E

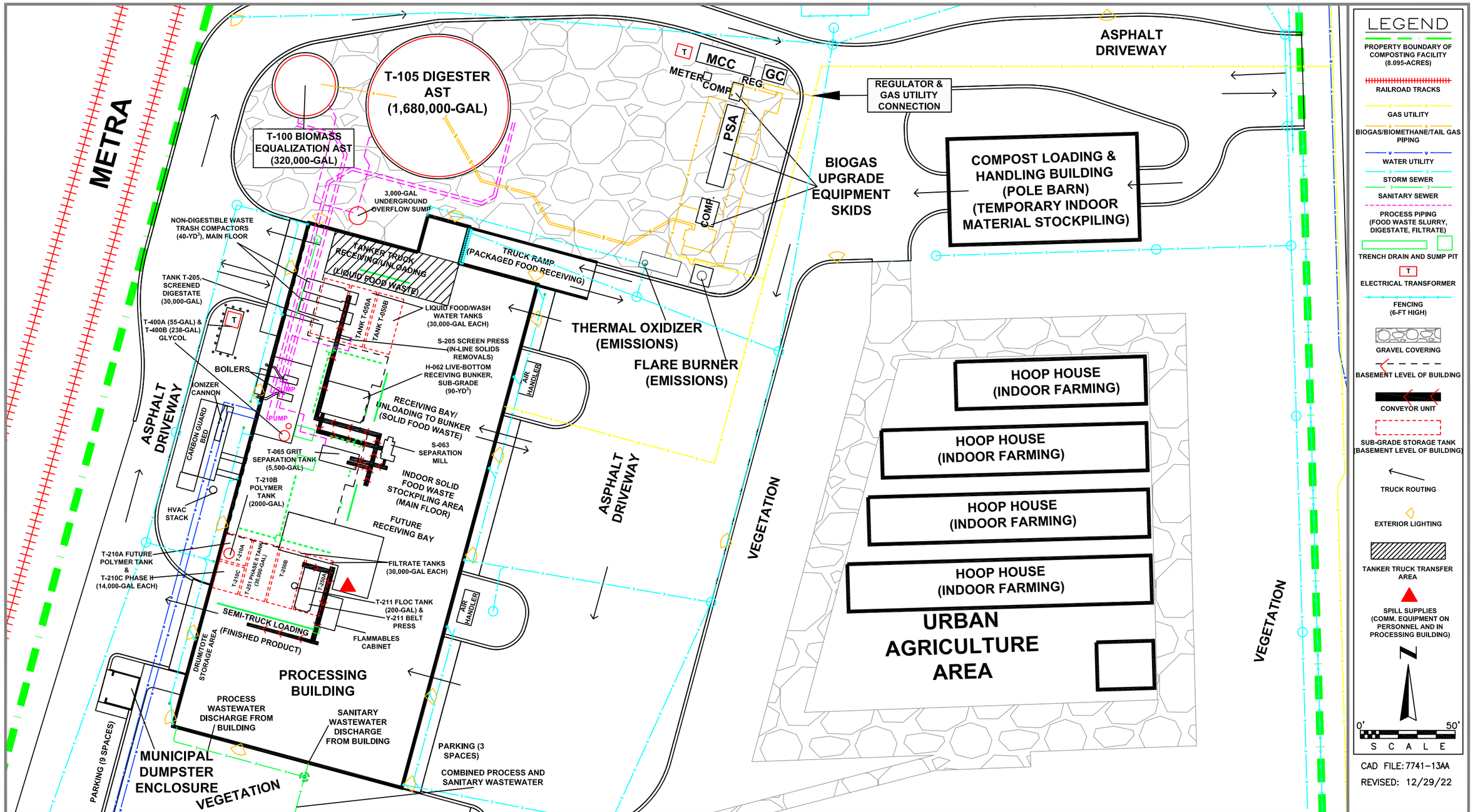
CAD FILE: 7741-12A

REVISED: 12/21/22

DAI ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

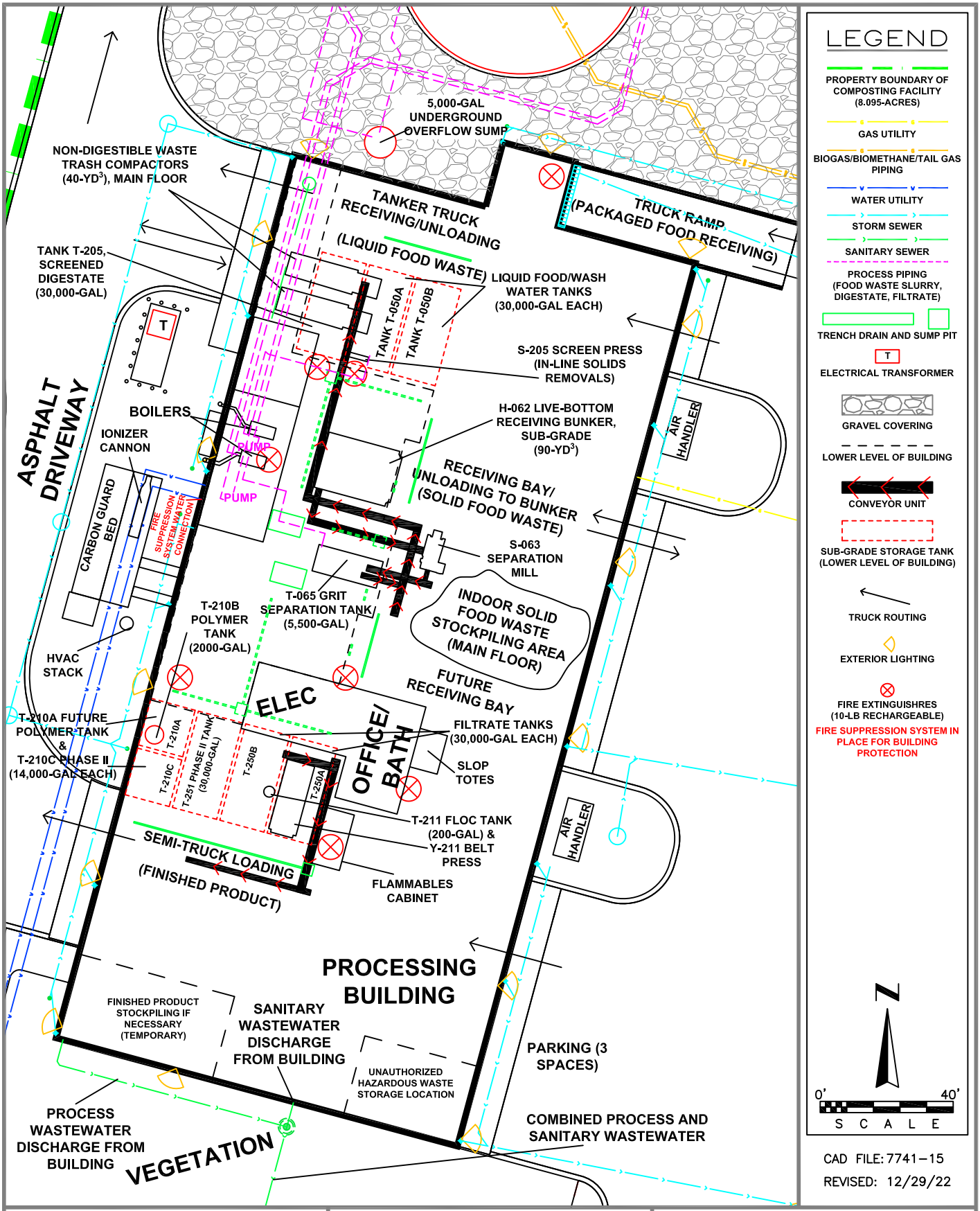
FIGURE 3
SITE PLAN AND DRAINAGE DETAIL



DAI ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 3A
SITE DETAIL SHOWING
PROCESS OPERATIONS AND EQUIPMENT



CAD FILE: 7741–15

REVISED: 12/29/22

ENVIRONMENTAL

GREEN ERA RENEWABLE ENERGY AND URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS

FIGURE 3B
PROCESS BUILDING DETAIL

APPENDIX A
SOP-21-001
(SPILL RESPONSE PROCEDURES)

Green Era	**Standard Operating Procedure Spill Contingency Plan (< 50,000-gallons)**	SOP-21-001 Revision: 3 Effective: 02/20/23 Reviewed: 02/20/23

1 Purpose

This SOP establishes consistent methods for responding to spills of volumes less than 50,000-gallons, mitigating the impact, clean-up, recordkeeping, and notification. Refer to SOP-21-009 in the event of a catastrophic spill (including spills of digestate greater than 50,000-gallons).

2 Scope

This SOP applies to facility operations at the Green Era digester facility and affiliated contract operations for product transportation on public or private roadways and/or composting operations.

3 Definitions and Acronyms

3.1 Cake Solids

The semi-solid organic fiber separated from the stabilized anaerobic digestate during the dewatering process. This material still contains between 70% and 80% water, but is stackable. Cake solids can contain pathogens. The cake solids can contain a significant amount of plant available nitrogen and phosphorus, similar to animal manure.

3.2 Carbon Dioxide

Odorless, colorless gas that is non-combustible. Carbon dioxide is produced by bacteria during anaerobic digestion and may be released from feedstock or digestate during a spill event. In confined spaces, carbon dioxide can displace oxygen and represents a suffocation hazard.

3.3 Digestate

Digestate is the resultant liquor after the process of anaerobic digestion has treated the feedstock. For this facility, digestate is always pumpable. Digestate can contain pathogens. The pH of the digestate is normally slightly alkaline and can range from 7.2 pH to 8.5 pH. Digestate may produce hazardous gasses including methane, carbon dioxide, and hydrogen sulfide. The digestate contains a significant amount of plant available nitrogen and phosphorus, similar to liquid animal manures.

3.4 Feedstock

Any solid or pumpable untreated organic waste that is received by the facility for treatment by anaerobic digestion, whereby volatile solids will be reduced and pathogens will be reduced. Feedstock can contain pathogens. The pH of feedstock varies depending on the source organic material. It is often acidic, especially after holding in a tank. The pH of hydrolyzed feedstock within the feedstock tank can vary from 3 to 5 SU. Feedstock may produce hazardous gasses including methane, carbon dioxide, and hydrogen sulfide.

3.5 4 gas meter

A portable safety device that is used to detect the presence of combustible gasses, low oxygen levels, and hydrogen sulfide. Fire departments will have these meters on the truck. Green Era keeps these meters at the plant.

3.6 Hydrogen Sulfide

Colorless gas that has a pungent smell similar to rotten eggs, natural gas odorants, or a skunk. Hydrogen sulfide can be smelled at levels lower than 1 part per million. Hydrogen sulfide can accumulate in confined spaces and is toxic. 10 PPMV is the OSHA permissible exposure limit over an 8-hour time weighted average. A personal respirator should be worn when H2S is detected above 5 PPMV by a 4-gas meter.

3.7 Methane

Odorless, colorless gas that is combustible and can be an explosive hazard in the presence of oxygen. Methane is produced by bacteria during anaerobic digestion and may be released from digestate during a spill event.

3.8 Plant Operator

Onsite personnel who have the designated responsibility to operate and maintain the facility on behalf of Green Era.

3.9 Acronyms

SOP – Standard Operating Procedure
PPE – personal protective equipment

4 Procedure in the event of a spill

4.1 Evacuate the area to protect yourself and others

First move to a safe location to assess the spill. Be aware of gasses that may be released from the spill. Move to a well-ventilated area if inside, or upwind, if outdoors. Gather and use PPE equipment as needed before reentering the spill affected area. PPE equipment will depend on the hazard, but is likely to include gloves, boots, respirator, and a 4-gas meter.

4.2 Get help and Notify

Notify others nearby first to alert them to the spill and have them visually monitor the activity from a safe location. Do not reenter the spill affected area without having one or more persons onsite who would be able to help if you have an accident containing the spill. Contact the plant operations manager if not already notified. If the spill, of 25 gallons or more, occurred on a public site, call the IEPA Spill Hotline at 1-800-282-9378.

4.3 NOTIFICATIONS (25 gallons or more that isn't contained on Green Era's property)

In contacting the Illinois Emergency Management Agency (1-800-782-7860), the City of Chicago (call 911 if an emergency response such as a catastrophic spill), or the City of Chicago Department of Public Health (via email, as per the Liquid Waste Handling Facilities Permit), plan to provide the following information.

4.3.1 Responsible Party – name of carrier

4.3.2 Date/time of the spill

4.3.3 Location (address, cross-street, or mile marker) use phone to determine location if needed.

4.3.4 Materials (cake solids, digestate, or feedstock product). If the result of a traffic accident, check for diesel or fuel leakage.

4.3.5 Quantity (estimated spilled and the total potential amount – size of tank)

4.3.6 Hazards (pathogens, H2S) and advise for any first responders

4.3.7 Affected media/area (air, land or waterway, including threats to ditches, storm sewers, and streams).

4.3.8 Actions/notifications (evacuations, containment, contractor hired for cleanup)

4.3.9 Contacts on the scene (responder cell phone, responsible party, contractor, facility point of contact)

4.3.10 Other useful info. (Truck DOT number etc.).

4.4 Stop the source of the spill

If possible, stop further material from being spilled and/or take steps to reduce the flow of material from the containment.

4.4.1 Close valves

If a pipe has broken, and an upstream valve is accessible, close the valve.

4.4.2 Stop pumping

For tank overflows, stop pumping into the tank and begin to transfer out of the tank to other tanks with available storage volume, if possible.

4.5 Contain the spill

For small volume spills where the following is feasible, build berms with available material to contain spill and direct fluid away from storm water drains, swales, ditches or any waters of the state. Bermed dirt and sand bags can be effective in diverting flow. A dug hole can help

to pump up material with a vac truck. Fine shredded bark mulch and/or saw dust can be effective in absorbing small amounts of spilled liquid so it can be handled as a solid. Straw bales can be used to dike ditches if staked.

Small volumes of spilled cake solids can be shoveled into a truck or other bin. Larger volumes of spilled cake solids can be cleaned up with a loader. If cake sludge was spilled on a public roadway, the area should be swept broom clean. After sweeping, if residual remains on the roadway that would make the surface slippery, the material should be rinsed off with water.

Fuels or oils should be absorbed with oil dry and/or absorbent mats that are kept in the facility's spill kit.

To address larger volume spills (including a catastrophic spill of digestate from the digester), refer to SOP-21-009 (Catastrophic Spill Containment Plan).

A list of current emergency response operators that can be called upon to provide services include the following (and in total are believed to have access to over sixty (60) 5,500-gallon vacuum recovery trucks):

4.6 Document the extent of the spill

Use a cell phone or digital camera to take photos and/or video of the spill source, affected area and containment. Use voice memos or take notes for further incident documentation and reporting. Note the time the spill occurred and the time when the spill was contained.

4.7 Clean up

4.7.1 Large volume spills, greater than 25 gallons (including catastrophic release)

Have a vacuum truck service assist with clean-up of large quantities of spilled liquids. A list of current emergency response operators that can be called upon to provide services include the following (and in total are believed to have access to over sixty (60) 5,500-gallon vacuum recovery trucks):

<u>Preferred (contractor with contractual agreement)</u>
SET Environmental; Wheeling, IL (877-437-7455)

<u>Additional and Alternate Contractors</u>
HazChem Environmental; Addison, IL (630-458-1910)
Heritage Environmental; Lemont, IL (877-436-8778)
Clean Harbors; New Lenox, IL (815-836-8813)

GFL (formerly Future Environmental); Mokena, IL (708-479-6900)
Safety-Kleen; Dolton, IL (708-225-8500)
ERC Midwest (formerly North Branch); Roselle, IL (630-529-0240)

Dig holes, if necessary, to create sump areas for the vac truck to use. Direct spilled fluids/sludges to the holes. After recovery, the preferred disposal location of the recovered liquid is the MWRD Calumet Water Reclamation Plant, which has a High Strength Organic Materials (HSOM) acceptance program. However, in the event the recovered digestate cannot be sent to the MWRD, the following facilities are located within a reasonable distance from the Site and could be used as alternate disposal options to the MWRD Calumet Plant:

Liquid Environmental Solutions; Chicago, IL (866-694-7327)
Circon Environmental (formerly Beaver Oil); Hodgkins, IL (219-881-9234)
Circon Environmental (formerly Water Integrated Treatment Systems); Dolton, IL (708-880-0400)

4.7.2 Spills on impervious (paved) surfaces

Use rubber squeegees, brooms and flat scoop shovels, to remove bulk material from paved areas and roadways. Push to an area where bulk material can be contained and removed.

4.7.3 Public Roadways

Set up cones and have someone direct traffic away from the spill as necessary. Notify the local authority of this activity, sheriff, State Highway Patrol, or local police dept.

After removing bulk sludge from a roadway, flush the roadway with fresh water after a spill to clean. The size of the spill on a public roadway and length of affected area will determine the type of equipment used to irrigate the road. A pressure washer service or vac truck with water on board may be used effectively depending on the spill type. If there is a major public safety issue or the spill occurred on a busy highway, the local authority may have the fire dept respond to assist. Roadways should be cleaned to the satisfaction of the local authority.

4.8 Document the clean-up

Use a cell phone or digital camera to take photos and/or video of the cleaned area. Use voice memos or take notes for further incident documentation and reporting of the clean-up methods used. Be sure to note who responded to the spill, who assisted with clean-up, and

equipment that was used. Note the time when the clean-up started and when it was completed.

4.9 Additional Internal Notification

Plant manager should be informed of the spill and s/he should inform the operations manager and the asset manager.

4.10 Regulatory Notification

If the spill was more than 25 gallons and occurred off-site, the spill should be reported to the Illinois EPA Office of Emergency Response (217-782-3637) and a spill report should be filed with their office. Additionally, the City of Chicago may require notifications (consult requirements specified in the Chicago Liquid Waste Handling Facility Permit). Initial notification should occur within 24 hours of the incident with report to follow within 5 days.

Contact the MWRD (312-751-5600) if any slug discharge or potential slug discharge will occur as a result of the spill or clean-up. The storm water and sanitary sewers are a combined system at the Green Era plant and they are treated by the Stickney Water Reclamation Plant. Refer to SOP-21-002 for additional details regarding procedures and reporting in the event of a spill that reaches the sewer system.

4.11 Record retention

Spill reports and incident records should be retained for the life of the facility.

5 References

5.1 SOP-21-002 Sewer Spill Prevention and Reporting

5.2 SOP-21-009 Catastrophic Spill Containment Plan

5.3 MP-06 Green Era Emergency Response Plan

5.4 MP-14 SPCC Plan

APPENDIX B
SOP-21-002
(SEWER SPILL PREVENTION AND REPORTING)

Green Era	**Standard Operating Procedure** **Sewer Spill Prevention and Reporting**	SOP-21-002 Revision: 4 Effective: 02/20/23 Reviewed: 02/20/23

1 Purpose

This SOP establishes consistent methods for preventing unintended discharges to the Chicago sewer and for responding to a spill that has entered the combined sanitary and stormwater sewer system through a floor drain, manhole, or pipe and may impact the receiving Chicago wastewater treatment facility. Additionally, refer to SOP-21-009 Catastrophic Spill Containment Plan and MP-14 SPCC Plan.

2 Scope

This SOP applies to facility operations at the Green Era plant.

3 Definitions and Acronyms

3.1 Carbon Dioxide

Odorless, colorless gas that is non-combustible. Carbon dioxide is produced by bacteria during anaerobic digestion and may be released from feedstock or digestate during a spill event. In confined spaces, carbon dioxide can displace oxygen and represents a suffocation hazard.

3.2 Detention Pond

The earthen stormwater holding pond on the southeast corner of the Green Era site that collects storm water from all on-site stormwater gathering pipes. Retained stormwater will overflow to the City sewer after reaching an invert elevation of 9-feet and will discharge through an 8-inch pipe from the catch basin located in the southeast corner of the property.

3.3 Digestate

Digestate is the resultant liquor after the process of anaerobic digestion has treated the feedstock. For this facility, digestate is always pumpable. Digestate can contain pathogens. The pH of the digestate is normally slightly alkaline and can range from 7.2 pH to 8.5 pH. Digestate may produce hazardous gasses including methane, carbon dioxide, and hydrogen sulfide.

3.4 Fats, Oils, and Grease

Fats, Oils, and Grease (FOG) is a classification of feedstock that is received at Green Era. FOG is collected from grease traps by vacuum trucks from food service establishments. FOG is a mixture of water and lower density fats, oils, and grease that have a lower density than the water and float on top of the water. This waste may also include food solids.

3.5 Feedstock

Any solid or pumpable untreated organic waste that is received by the facility for treatment by anaerobic digestion, whereby volatile solids will be reduced and pathogens will be reduced. Feedstock can contain pathogens. The pH of feedstock varies depending on the source organic material. It is often acidic, especially after holding in a tank. The pH of hydrolyzed feedstock within the feedstock tank can vary from 3 to 5 SU. Feedstock may produce hazardous gasses including methane, carbon dioxide, and hydrogen sulfide.

3.6 Filtrate

The remaining water after solids are separated from the digestate during the dewatering process on the belt press. Filtrate will be discharged to the sanitary sewer.

3.7 4 gas meter

A portable safety device that is used to detect the presence of combustible gasses, low oxygen levels, and hydrogen sulfide. Fire departments will have these meters on the truck. Green Era keeps these meters at the plant.

3.8 Hydrogen Sulfide

Colorless gas that has a pungent smell similar to rotten eggs, natural gas odorants, or a skunk. Hydrogen sulfide can be smelled at levels lower than 1 part per million. Hydrogen sulfide can accumulate in confined spaces and is toxic. 10 PPMV is the OSHA permissible exposure limit over an 8-hour time weighted average. A personal respirator should be worn when H2S is detected above 5 PPMV by a 4-gas meter.

3.9 Methane

Odorless, colorless gas that is combustible and can be an explosive hazard in the presence of oxygen. Methane is produced by bacteria during anaerobic digestion and may be released from digestate during a spill event.

3.10 Plant Operator

Onsite personnel who have the designated responsibility to operate and maintain the facility on behalf of Green Era.

3.11 Sewer, or Sanitary Sewer

The pipe system that carries wastewater and stormwater to a Chicago wastewater treatment facility. The Green Era facility is connected to a sewer main pipe that carries the waste to the Stickney Water Reclamation Facility.

3.12 Slug Discharge

Any discharge to the sewer system of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge. Definition in accordance with 40 CFR 403.8(F)(2) (VI).

3.13 Storm water

Rainwater that is collected from impervious surfaces (pavement, buildings) and directed to common discharge pipes that discharge it to surface waters of the State (creeks, streams, rivers) or to a combined sanitary and stormwater sewer pipe.

3.14 Acronyms

COD – Chemical Oxygen Demand
FOG – fats, oils, and grease
PPE – personal protective equipment
SOP – Standard Operating Procedure
TS – Total Solids
WWTP – waste water treatment plant

4 Normal Discharge Practices to the City Sewer

4.1 Process Building

The process building is connected to the sanitary sewer. An 8-inch sanitary sewer pipe exits the south face of the building, and a 4-inch process wastewater pipe exits the west face of the building. The two pipes combine just south of the building and flow through an 8-inch pipe, first south, then east, connecting to a Metering Manhole located just west of the W. 83rd Street entrance drive and just north of the south property line. The wastewater then flows to the final discharge manhole that is located just east of the W. 83rd Street entrance drive and just north of the south property line, from which it flows to the combined sewer beneath W. 83rd Street.

The building restrooms, sinks, shower, and boiler room floor drains are all connected with the sanitary sewer. Trench drains on the main level receiving floor, dewatering area, and lower level are connected to the process sumps and liquid receiving tanks for treatment in through the anaerobic digester.

No concentrated chemicals shall be dumped, disposed of, or discharged to the sinks or floor drains.

All digestate and process wastewater resulting from the treatment of organic waste shall be stored in closed tanks. Wastewater will be discharged to the sanitary district under an approved Discharge Authorization.

4.1.1 Dewatered Filtrate / Process Wastewater

Filtrate from the dewatering operation (belt press) will drain to two below slab receiving tanks. The filtrate will be pumped from these tanks through a force main to the sanitary discharge pipe. An electromagnetic flowmeter will be installed in the filtrate force main and discharge volume will be recorded on the plant SCADA. The filtrate will also be composite sampled for nutrient analysis. The facility combined discharge (i.e., process wastewater plus sanitary wastewater) will be sampled semi-annually per MWRD requirements for compliance certification and invoicing.

4.2 Yard overflow tank

The yard process tanks (biomass tank and digester) have dedicated overflow pipes at the maximum tank operating levels below the roof. The overflow pipes are routed down the outside of the tanks and are piped to a concrete transfer tank in the yard. The transfer tank has redundant sump pumps to transfer any overflowed sludge or foam to the feedstock receiving pits in the process building so it can be treated again in the AD system. There are multiple controls in place to prevent tank overflow conditions from occurring. The highest risk for a tank overflow condition is in the feedstock tank if the blend of feedstocks produces a lot of gas and foaming occurs whereby the density of the feedstock in the tank is reduced due to the entrained gas and would provide a false level reading from the pressure sensor at the base of the tank used to determine tank level. A secondary level sensor is also installed at the top of the tank that uses radar to directly detect the distance to the liquid level. The level readings from both sensors is continually monitored by the SCADA and will notify operations staff if foam conditions are detected so steps can be taken to ensure an overflow event does not occur.

4.3 Condensate trap

The gas condensate trap that collected hydrogen sulfide laden water from the biogas piping is pumped to the liquids receiving tank at the head of the plant. The condensate trap manhole is located northwest of the flare and thermal oxidizer.

5 Storm water

5.1 Collection System

All stormwater catch basins and stormwater culverts on the site discharge to the detention pond on the southeast corner of the property. Under normal conditions, retained stormwater will overflow to the City sewer after reaching an invert elevation of 9-feet and will discharge through an 8-inch pipe from the catch basin located in the southeast corner of the property. In the event of a catastrophic release event that results in digestate or other unsuitable liquids entering the detention pond, the outfall of the detention pond will be

manually closed via a plug valve installed at outfall (catch basin CB13). As such, no discharges to the City sewer or MWRD sewer system is anticipated as a result of a catastrophic release. See SOP-21-001 (Spill Contingency Plan) for response procedures in the event of a small volume release and SOP-21-009 (Catastrophic Spill Containment Plan) for further information regarding the procedures that are to be followed in the event of a catastrophic release of digestate.

5.2 Parking area catch basins

Catch basins in the parking area are connected with the storm water drains. This flow does not directly enter the waters of the State. It is collected in the detention pond and then overflows to the combined sanitary and stormwater sewer.

5.3 Tank Yard

The catch basins in the tank yard are connected to the stormwater system. In event of a minor spill in the tank yard, these catch basins in the yard should be plugged and/or covered to prevent discharge of any runoff to the detention pond. In the event of a catastrophic release of digestate, these catch basins should NOT be plugged, as the response plan calls for the detention pond to provide temporary storage of the spilled digestate prior to removal via facility response using on-site high capacity diesel powered recovery pumps (see SOP-21-009 for additional details).

6 Stored Chemicals

6.1 Bulk quantities in excess of 5 gallons

Chemical	Where Used	Quantity Stored	Storage Container
Virgin Motor Oil, hydraulic oils, gearbox oils	Stationary Engine / Generator, Gas compressors.	Less than 600 gallons	55 gallon steel drums or 275 gallon totes
Used Oils	Stationary Engine / Generator, Gas compressors.	Less than 300 gallons	55 gallon steel drums or 275 gallon totes
Virgin Ethylene Glycol	Stationary Engine / Process heating (boiler) as heat transfer fluid	Less than 300 gallons	55 gallon steel drums or 275 gallon totes. Also in plastic tank system feeders, qty 2 in building.
Diluted Ethylene Glycol	Stationary Engine / Process heating (boiler) as heat transfer fluid	Less than 300 gallons.	Drained glycol from process heating system during maintenance.

6.2 Non-bulk Chemicals

An inventory listing of all fuels, lubricants, paints, cleaning products and other chemicals used for the maintenance and upkeep of the facility shall maintained. Chemicals used for laboratory testing should also be listed. See facility chemical inventory list (maintained at plant) with SDS sheets.

7 Procedures in event of a Spill or SLUG discharge to the sewer

7.1 For a spill, evacuate the area to protect yourself and others

First move to a safe location to assess the spill. Be aware of gasses that may be released from the spill. Move to a well-ventilated area if inside. Gather and use PPE equipment as needed before reentering the spill affected area. PPE equipment will depend on the hazard, but is likely to include gloves, boots, respirator, and a 4-gas meter.

7.2 Get help and Notify

Notify others nearby first to alert them to the spill and have them visually monitor the activity from a safe location. Do not reenter the spill affected area without having one or more persons onsite who would be able to help if you have an accident containing the spill. Contact the plant operations manager if not already notified.

7.3 MWRD Immediate Notification

During normal business hours, contact the MWRD R&D Dept., Industrial Waste Division to report the discharge.

MWRD Industrial Waste Div. (312) 751-3044 – follow the representative's instructions, if no one is directly reached, leave a message and call the number below for the Systems Dispatcher available 24/7.

Systems Dispatcher: (312) 787-3575, staffed 24/7

Be prepared to provide the following information

7.3.1 Your name and cell phone number where you can be reached.

7.3.2 Service address: 650 West 83rd

7.3.3 Company name: Green Era

7.3.4 Federal Tax ID: 81-3934327

7.3.5 Date/time of the spill

7.3.6 Materials (digestate, feedstock product, or chemical)

7.3.7 Specify the approximate TS and COD if the material is digestate or feedstock.

7.3.8 Quantity (estimated spilled and the total potential amount – size of tank or line where you expect the leak to be originating from)

7.3.9 Hazards (pathogens, H2S)

7.3.10 Entry point – let them know where the material is entering the sewer, manhole, stormwater overflow, etc.

7.3.11 Actions/notifications (evacuations, containment, contractor hired for cleanup)

7.3.12 Contacts on the scene (responder cell phone, responsible party, contractor, facility point of contact)

7.3.13 Record the representative's contact information and the time the call was made.

7.4 Stop the source of the spill

If possible, stop further material from being spilled and/or take steps to reduce the flow of material from the containment.

7.4.1 Close valves

If a pipe has broken, and an upstream valve is accessible, close the valve.

7.4.2 Stop pumping

For tank overflows, stop pumping into the tank and begin to transfer out of the tank to other tanks with available storage volume, if possible.

7.5 Contain the spill

Build berms with available material to contain spill and direct fluid away from sewer drains and or stormwater catch basins. Bermed dirt and sand bags can be effective in diverting flow. If outdoors and entering through a manhole, a dug hole can help to pump up material with a vac truck. Fine shredded bark mulch and/or saw dust can be effective in absorbing small amounts of spilled liquid so it can be handled as a solid. Straw bales can be used to dike ditches if staked.

7.6 Document the extent of the spill

Use a cell phone or digital camera to take photos and/or video of the spill source, affected area and containment. Use voice memos or take notes for further incident documentation and reporting. Note the time the spill occurred and the time when the spill was contained.

7.7 Clean up

7.7.1 Large volume spills, greater than 25 gallons, less than 50,000-gallons

Have a vacuum truck service assist with clean-up of large quantities of spilled liquids. Dig holes to create sump areas for the vac truck or other recovery equipment to use. Direct spilled fluids/sludges to the holes. Refer to SOP-21-009 Catastrophic Spill Containment Plan, in the event of a catastrophic spill.

7.7.2 Spills on impervious (paved) surfaces

Use rubber squeegees, brooms and flat scoop shovels, to remove bulk material from paved areas and roadways. Push to an area where bulk material can be contained and removed.

7.8 Document the clean-up

Use a cell phone camera or other digital camera to take photos and/or video of the cleaned area. Use voice memos or take notes for further incident documentation and reporting of the clean-up methods used. Be sure to note who responded to the spill, who assisted with clean-up, and equipment that was used, and which agencies were notified with their contacts. Note the time when the clean-up started and when it was completed.

7.9 Additional Internal Notification

Plant manager should be informed of the spill and s/he should inform the operations manager and the asset manager.

7.10 Further Regulatory Notification

A written follow-up report shall be submitted to MWRD within five (5) calendar days of the incident. **The current form is RD-116, revised July 1998.**

https://mwrd.org/sites/default/files/documents/RD-116.pdf

The report shall contain the following:

1. A description of the discharge, the cause of the upset, and the upsets impact upon the user's compliance status.

2. The period of non-compliance, including the exact dates and times of noncompliance, and if the noncompliance continues, the time by which the non-compliance is expected to be corrected.

3. Any and all steps taken, or to be taken, to reduce, eliminate, and prevent recurrence of the non-compliance.

Submit this written report to:

MWRD
Industrial Waste Division
Enforcement Section
111 East Erie Street
Chicago, Illinois 606111
E-Mail: mwrd-ucts@mwrd.org

7.11 Record retention

Spill reports and incident records should be retained for the life of the facility.

8 Training and Spill Prevention

8.1 Training

8.1.1 New employees shall be trained on the content of this SOP no later than 30 days after their first day of employment.

8.1.2 Current staff shall review this plan every 24 months along with the Spill Contingency Plan.

8.2 Prevention

8.2.1 Regular preventative maintenance and visual inspection of pumps and piping systems that convey process wastewater in the facility.

8.2.2 Store chemicals with secondary containment or keep in areas where containers are protected from damage from forklifts or other traffic.

8.2.3 Only store chemicals in containers approved for the use.

8.2.4 Minimize the volume of chemicals stored onsite.

9 Detection

9.1 Camera system and staffing

9.1.1 Maintain camera system that can remotely monitor areas of the plant for spills.

9.1.2 Walk at the beginning and end of staffed shifts to visually inspect all assets.

9.2 Automatic monitoring and alarms

SCADA/PLC system shall monitor tank levels for unexpected changes. Unexpected level drops will interlock all pumping processes to that tank and close all automatic valves to isolate piping sections. An alarm will notify the responsible party through SMS text messaging or email.

10 References

10.1 Emergency Management Plan

10.2 SOP-21-001 Spill Contingency Plan

10.3 SOP-21-009 Catastrophic Spill Containment Plan

10.4 Green Era Stored Chemical List - site log

10.5 Record drawings, stored onsite, Site Utility Plan (C-4), Building Plumbing Plans

10.6 MP-14 SPCC Plan

APPENDIX C
SOP-21-009
(CATASTROPHIC SPILL CONTAINMENT PLAN)

Green Era	**Standard Operating Procedure** **Catastrophic Spill Containment Plan**	SOP-21-009 Revision: 1 Effective: 02/20/23 Reviewed: 02/20/23

1 Purpose

This SOP establishes consistent methods for responding to spills in excess of 50,000 gallons, procedures for containment, mitigating the impact, clean-up, recordkeeping, and notification.

2 Scope

This SOP applies to facility operations at the Green Era digester facility.

3 Definitions and Acronyms

3.1 Carbon Dioxide

Odorless, colorless gas that is non-combustible. Carbon dioxide is produced by bacteria during anaerobic digestion and may be released from feedstock or digestate during a spill event. In confined spaces, carbon dioxide can displace oxygen and represents a suffocation hazard.

3.2 Catastrophic Spill

Any unintended release of digestate or feedstock from piping, tanks, or other vessels to the environment that is in excess of 50,000 gallons or is expected to exceed 50,000 gallons when the source of the spill cannot be stopped or contained in a timely manner. The only storage facilities at Green Era in excess of 50,000 gallons are the biomass tank and the digester tank.

3.3 Digestate

Digestate is the resultant liquor after the process of anaerobic digestion has treated the feedstock. For this facility, digestate is always pumpable. Digestate can contain pathogens. The pH of the digestate is normally slightly alkaline and can range from 7.2 pH to 8.5 pH. Digestate may produce hazardous gasses including methane, carbon dioxide, and hydrogen sulfide. The digestate contains a significant amount of plant available nitrogen and phosphorus, similar to liquid animal manures.

3.4 Feedstock

Any solid or pumpable untreated organic waste that is received by the facility for treatment by anaerobic digestion, whereby volatile solids will be reduced and pathogens will be reduced. Feedstock can contain pathogens. The pH of feedstock varies depending on the source organic material. It is often acidic, especially after holding in a tank. The pH of hydrolyzed feedstock within the feedstock tank can vary from 3 to 5 SU. Feedstock may produce hazardous gasses including methane, carbon dioxide, and hydrogen sulfide.

3.5 4 gas meter

A portable safety device that is used to detect the presence of combustible gasses, low oxygen levels, and hydrogen sulfide. Fire departments will have these meters on the truck. Green Era keeps these meters at the plant.

3.6 Hydrogen Sulfide

Colorless gas that has a pungent smell similar to rotten eggs, natural gas odorants, or a skunk. Hydrogen sulfide can be smelled at levels lower than 1 part per million. Hydrogen sulfide can accumulate in confined spaces and is toxic. 10 PPMV is the OSHA permissible exposure limit over an 8-hour time weighted average. A personal respirator should be worn when H2S is detected above 5 PPMV by a 4-gas meter.

3.7 Methane

Odorless, colorless gas that is combustible and can be an explosive hazard in the presence of oxygen. Methane is produced by bacteria during anaerobic digestion and may be released from digestate during a spill event.

3.8 Plant Operator

Onsite personnel who have the designated responsibility to operate and maintain the facility on behalf of Green Era.

3.9 Acronyms

SOP – Standard Operating Procedure
PPE – personal protective equipment

4 Procedure in the event of a catastrophic spill

4.1 Evacuate the area to protect yourself and others

First move to a safe location to assess the spill. Be aware of gasses that may be released from the spill. Move to a well-ventilated area if inside, or upwind, if outdoors. Gather and use PPE equipment as needed before reentering the spill affected area. PPE equipment will depend on the hazard, but is likely to include gloves, boots, respirator, and a 4-gas meter.

4.2 Get help and Notify

Notify others nearby first to alert them to the spill and have them visually monitor the activity from a safe location. Do not reenter the spill affected area without having one or more persons onsite who would be able to help if you have an accident containing the spill. Contact the plant operations manager if not already notified. If the spill, of 25 gallons or more, occurred on a public site, call the IEPA Spill Hotline at 1-800-282-9378.

4.3 IEMA Spill Notification 1-800-782-7860 (25 gallons or more that isn't contained on Green Era's property)

If contacting the Illinois Emergency Management Agency, plan to provide the following information.

4.3.1 Responsible Party – name of carrier

4.3.2 Date/time of the spill

4.3.3 Location (address, cross-street, or mile marker) use phone to determine location if needed.

4.3.4 Materials (cake solids, digestate, or feedstock product) If the result of a traffic accident, check for diesel or fuel leakage.

4.3.5 Quantity (estimated spilled and the total potential amount – size of tank)

4.3.6 Hazards (pathogens, H2S) and advise for any first responders

4.3.7 Affected media/area (air, land or waterway, including threats to ditches, storm sewers, and streams)

4.3.8 Actions/notifications (evacuations, containment, contractor hired for cleanup)

4.3.9 Contacts on the scene (responder cell phone, responsible party, contractor, facility point of contact)

4.3.10 Other useful info. (Truck DOT number etc.)

4.4 Stop the source of the spill

If possible, stop further material from being spilled and/or take steps to reduce the flow of material from the containment.

4.4.1 Close valves

If a pipe has broken, and an upstream valve is accessible, close the valve.

4.4.1.1 Feedstock tank valves

Two 10-inch manual valves are located in the tank building and supply the manifolds. The suction manifold valve is labeled HVK-100B and the valve may be closed by turning the wheel clockwise to seat the knife gate.

The pressure manifold valve is labeled HVK-100A and the valve may be closed by turning the wheel clockwise to seat the knife gate.

4.4.1.2 Digester tank valves

Two 10-inch manual valves are located in the tank building and supply the manifolds. The suction manifold valve is labeled HVK-105B and the valve may be closed by turning the wheel clockwise to seat the knife gate.

The pressure manifold valve is labeled HVK-105A and the valve may be closed by turning the wheel clockwise to seat the knife gate.

4.4.2 Stop pumping

For tank overflows, stop pumping into the tank and begin to transfer out of the tank to other tanks with available storage volume, if possible.

4.5 Contain the spill

4.5.1 Close the plug valve at the normal outlet (CB13) of the stormwater detention pond.

Spilled sludge on the site will flow to the stormwater detention pond through the stormwater drainage system.

The normal outfall of the detention pond (at CB13) is an 8-inch diameter outfall to the combined sanitary/storm sewer from a manhole at the southeast corner of the site. A pond overflow outfall (STM MH8) is also present along the southern boundary of the detention pond.

To prevent any sludge or sludge and stormwater from entering the combined sewer, the plug valve at CB13 at the outfall from the detention pond should be manually closed.

To close the plug valves, use a valve wrench to turn the valve clockwise until the plug seats. A valve wrench will be stored at all times in a labeled and capped PVC pipe at the fence for emergency use.

Notify the Operations Manager that the plug valve has been closed and any other authorities. Leave the valve wrench on the valve.

Upon completion of the removal of spilled digestate from the detention pond and any other areas on Site that could discharge to the detention pond, open the plug valves at the outlets of the storm water detention pond, so that the pond can function as primarily designed (i.e., to convey storm water in a controlled manner from the Site to the sewer system).

4.5.2 Consider if diverting digestate to Processing Building lower level is necessary

Refer to procedures specified in SOP-21-010 (Flooding Lower Level of Process Building). In the event of a large volume spill that would otherwise flow off-site, close the outfall plug-valve at the detention pond, and then pump from the

detention pond to the lower level of the building, so as to recapture the ability of the detention pond to function as designed (i.e., with an outfall to the sewer system).

4.5.3 Determine if the stormwater pond will overflow

As constructed (13.00 CCD HWL), the total detention basin volume is 656,692-gallons. There is an additional 24,738-gallons of temporary storage volume in on-site sewer pipes and structures when the outfall of the detention pond at catch basin CB13 has been closed off, resulting in a total temporary storage volume in the pond of 681,430-gallons. The available volume to temporarily store spilled digestate will depend upon whether any of this total temporary storage volume is lost or will be lost due to temporary storage of actual storm water from a precipitation event. Consult the weather forecast and consider whether the full possible volume of the basin is available for temporary digestate storage. The City of Chicago Liquid Waste Facility permit limits the operating volume of the digester tank to 602,057-gallons. As such, there is an allowance for temporary storage of a precipitation volume of 79,373-gallons, and it is not expected that the stormwater pond will overflow even in a catastrophic spill event.

Follow the procedure in SOP-21-010 to flood the lower level from the digester tank or feedstock tank.

4.5.4 Construct Berms

Build berms with available material to contain spill and direct fluid towards the storm water drains, swales, ditches that lead to the stormwater detention pond. Bermed dirt can be effective in diverting flow. A dug hole can help to pump up material with a vac truck. Fine shredded bark mulch and/or saw dust can be effective in absorbing small amounts of spilled liquid so it can be handled as a solid. Straw bales can be used to dike ditches if staked.

4.6 Pump Spilled Material From Pond

The Operations Manager will direct on-site personnel to mobilize the on-site high-capacity diesel powered recovery pumps, and initiate the pumping of accumulated liquid from the detention pond to the lower level of the building. Locate the pump in an area adjacent to the pond that is accessible and can be reached with 24’ of suction hose. Attach the suction hose to the inlet of the pump with the quick coupler. Layout the dragline hose from the pump to the building using a telehandler or skidsteer to manage the reel. Couple the hose to the discharge side of the pump. Place the discharge end of the hose in the grit tank so the pumped flow can be contained and stilled prior to overflowing into the pit. Snake any excess length in the yard so it isn’t pinched. Once the pumps and hoses have been positioned at the pond, but prior to initiating

pumping, ensure that the procedures specified in SOP-21-010 Flooding Lower Level of Process Building have been completed. Then, initiate pumping by following the procedures on the pump skid to start the pump. Continue pumping until the recoverable liquids and sludge in the pond have been removed or the lower level detention area is full.

4.7 Contact Emergency Response Contractors

Call emergency response contractors to start the mobilization of vacuum recovery trucks to the Site, and to secure additional equipment and manpower assistance (as necessary) to respond to the spill. A list of such contractors will be maintained at the Site, and updated every 6-months. See below for a current list. This list must be updated every 6-months. The vacuum recovery trucks are expected to be the primary means to remove the liquid and sludge from the lower level of the building to off-site discharge/disposal options.

PRIMARY EMERGENCY RESPONSE CONTRACTOR
SET Environmental; Wheeling, IL (877-437-7455)

OTHER EMERGENCY RESPONSE CONTRACTORS
HazChem Environmental; Addison, IL (630-458-1910)
Heritage Environmental; Lemont, IL (877-436-8778)
Clean Harbors; New Lenox, IL (815-836-8813)
GFL (formerly Future Environmental); Mokena, IL (708-479-6900)
Safety-Kleen; Dolton, IL (708-225-8500)
ERC Midwest (formerly North Branch); Roselle, IL (630-529-0240)

Other potential haulers include the following:

New Era Spreading; Grant Park, IL (815-693-7695)
Walter and Son Hauling, Darien, WI (262-882-7867)

4.8 Open Plug Valve at Outfall of Detention Pond

Once the recoverable liquids/sludge from the detention pond have been pumped out, open the plug valve at the outfall of the detention pond (CB13).

4.9 Document the extent of the spill

Use a cell phone or digital camera to take photos and/or video of the spill source, affected area and containment. Use voice memos or take notes for further incident documentation and reporting. Note the time the spill occurred and the time when the spill was contained.

4.10 Perform Additional Site Cleanup Activities

Use water to irrigate areas with accumulated sludge and use pumps or vac trucks to remove wastewater from low areas or temporary sump pits.

4.10.1 Spills on impervious (paved) surfaces

Use rubber squeegees, brooms and flat scoop shovels, to remove bulk material from paved areas and roadways. Push to an area where bulk material can be contained and removed. After removing bulk sludge from the paved surface, flush the surface with fresh water after a spill to clean. A pressure washer service or vac truck with water on board may be used effectively depending on the spill type.

4.10.2 Spills on aggregate (stone)

For areas with compacted stone or gravel, irrigate with a fire hose to flush solids towards temporary sump pits and use a vac truck to remove surface water.

4.10.3 Spills on vegetated surfaces outside detention pond

Use a fire hose with a flat low velocity spray to wash any ponded sludge towards low spots or temporary sump pits to recover additional wastewater. Plant seasonal rye grass or other grass covers in areas with disturbed soils. Erect silt fencing until grasses establish to mitigate solids runoff.

4.11 Off-Site Disposal of Recovered Liquid and Sludge

The preferred disposal location of the recovered liquid and/or sludge is the MWRD Calumet Water Reclamation Plant, which has a High Strength Organic Materials (HSOM) acceptance program. However, in the event the recovered digestate cannot be sent to the MWRD, the following facilities are located within a reasonable distance from the Site and could be used as alternate disposal options to the MWRD Calumet Plant:

Liquid Environmental Solutions; Chicago, IL (866-694-7327)
Circon Environmental (formerly Beaver Oil); Hodgkins, IL (219-881-9234)
Circon Environmental (formerly Water Integrated Treatment Systems); Dolton, IL (708-880-0400)

Finally, another potential destination for the recovered digestate would be at land application (agricultural) sites, though given the further travel distance, closer, more cost-effective options would be initially utilized.

4.11.1 Spills on impervious (paved) surfaces

Use rubber squeegees, brooms and flat scoop shovels, to remove bulk material from paved areas and roadways. Push to an area where bulk material can be contained and removed.

4.11.2 Public Roadways

While site conditions and the restriction on the operating volume of the digester should preclude any off-site impacts even in the event of a catastrophic spill, the following direction is provided as a precaution. Should any spilled materials flow to off-site public roadways, follow the following procedures:

- Set up cones and have someone direct traffic away from the spill as necessary.
- Notify the City of Chicago by calling 911 if a large or catastrophic spill. Also, notify City of Chicago Department of Public Health via email per the Liquid Waste Handling Permit requirements.
- After removing bulk sludge from a roadway, flush the roadway with fresh water after a spill to clean. The size of the spill on a public roadway and length of affected area will determine the type of equipment used to irrigate the road. A pressure washer service or vac truck with water on board may be used effectively depending on the spill type. If there is a major public safety issue or the spill occurred on a busy highway, the local authority may have the fire department respond to assist. Roadways should be cleaned to the satisfaction of the local authority.

4.12 Document the clean-up

Use a cell phone or digital camera to take photos and/or video of the cleaned area. Use voice memos or take notes for further incident documentation and reporting of the clean-up methods used. Be sure to note who responded to the spill, who assisted with clean-up, and equipment that was used. Note the time when the clean-up started and when it was completed.

4.13 Additional Internal Notification

The Operations Manager should be informed of the spill and s/he should inform the rest of the staff and management team. If team members cannot immediately be reached via cell phone and text messages, messages should be left on their devices that explain the situation.

4.14 Regulatory Notification

In addition to the notifications to the City of Chicago via 911 in the event of a catastrophic spill, if the spill was more than 25 gallons and occurred offsite, the spill should be reported the Illinois EPA (217-782-3637) and a spill report should be filed with their office. Initial notification should occur within 24 hours of the incident with report to follow within 5 days.

Contact the MWRD (312-751-5600) if any slug discharge or potential slug discharge will occur as a result of the spill or clean-up. The storm water and sanitary sewers are a combined system at the Green Era plant and they are treated by the Stickney Water Reclamation Plant.

4.15 Record retention

Spill reports and incident records should be retained for the life of the facility.

5 References

5.1 MP-06 Green Era Emergency Response Plan

5.2 Record drawings, stored onsite, Site Utility Plan (C-4), Building Plumbing Plans

5.3 SOP-21-010 Flooding Lower Level of Process Building

5.4 MP-14 SPCC Plan

APPENDIX D
ILLINOIS SPILL NOTIFICATION FACT SHEET AND DISCHARGE NOTIFICATION FORMS

Submittal of Information to Regional Administrator for Qualified Discharge(s)

In the event of a qualified discharge or discharges, this page can be utilized to provide official notification to the Regional Administrator. If the Facility has had a discharge or discharges which meet one of the following two criteria, then this report must be submitted to the Regional Administrator within 60 days. (Check as appropriate)

- ☐ This Facility has experienced a reportable spill as referenced in 40 CFR Part 112.1(b) of 1,000 gallons or more.
- ☐ This Facility has experienced two (2) reportable spills (as referenced in 40 CFR Part 112.1(b)) of greater than 42 gallons each within a 12-month period.

Facility Name and Location: _____

_____

Facility Contact Person (Name, address/phone number): _____

_____

_____

Facility maximum storage or handling capacity: _____

_____

Facility normal daily throughput: _____

_____

_____

Describe the corrective action and countermeasures taken (include description of equipment repairs and replacements): _____

_____

_____

Describe the Facility (maps, flow diagrams and topographical maps attached as necessary): _____

_____

Describe the cause of discharge (as referenced in 40 CFR Part 112.1(b)) including failure analysis of the system is:_____

_____

Describe the preventative measures taken or contemplated to be taken to minimize the possibility of recurrence: _____

_____

Other pertinent information. _____

_____

- A copy of this report is also to be sent to the appropriate state agency in charge of oil pollution control activities

Spill Response Notification Form

Note: Do not delay spill notification to collect the information on the list.

Reporter's Name (First, M.I., Last): _____

Position: _____

Phone Numbers: Day ( ) _____ Evening ( ) _____

Company:

Organization Type:

Address:

City / State / Zip:

Were Materials Discharged? _____ (Y / N)

Confidential? _____ (Y / N)

Meeting Federal Obligations to Report? _____ (Y / N) Date Called: _____

Calling for Responsible Party? _____ (Y / N) Time Called: _____

INCIDENT DESCRIPTION

Source and/or Cause of Incident (include facility storage capacity and units): _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Date of Incident: _____

Time of Incident: _____ AM / PM

Incident Address/Location: _____

Nearest City: State:

County: Zip:

Distance from City:

Direction from City:

Section: Township: Range:

Borough: Not Applicable

Container Type: _____

Tank Oil Storage Capacity: _____ Units of Measure: _____

Facility Oil Storage Capacity:

Facility Latitude:

Facility Longitude:

MATERIAL

CHRIS Code of Measure	Discharge Quantity	Unit of Measure	Material Discharge in Water	Quantity	Units

CHRIS – US Coast Guard Chemical Hazards Response Information System (CHRIS)

RESPONSE ACTION

Actions Taken to Correct, Control or Mitigate Incident: _____

_____

_____

_____

_____

IMPACT

Number of Injuries: _____ Number of Deaths: _____

Were there Evacuations? _____ (Y / N) Number Evacuated: _____

Was there any Damage? _____(Y / N) Approximate Cost of Damages: _____

Medium Affected: _____

Description: _____

More Information about Medium: _____

_____

_____

_____

_____

_____

ADDITIONAL INFORMATION

Any information about the incident not recorded elsewhere in the report: _____

_____

_____

_____

_____

_____

_____

_____

CALLER NOTIFICATIONS

EPA? _____ (Y / N) USCG? _____ (Y / N)

State? _____ (Y / N) Other? _____ (Y / N)

Describe: _____

_____

_____

_____

_____

Log Sheet

Documentation of Government Agencies and Organizations Notified of a Discharge

Date: _____ Time: _____AM/PM (circle one)
Agency/Organization: _____
Agency Phone Number: _____
Name of Person Contacted: _____
Report Number (if any): _____

Name of Person Making Contact: _____Signature: _____

Notes/Comments (if any): _____
_____
_____

Date: _____ Time: _____AM/PM (circle one)
Agency/Organization: _____
Agency Phone Number: _____
Name of Person Contacted: _____
Report Number (if any): _____

Name of Person Making Contact: _____Signature: _____

Notes/Comments (if any): _____
_____
_____

Date: _____ Time: _____AM/PM (circle one)
Agency/Organization: _____
Agency Phone Number: _____
Name of Person Contacted: _____
Report Number (if any): _____

Name of Person Making Contact: _____Signature: _____

Notes/Comments (if any): _____
_____
_____

ILLINOIS EMERGENCY MANAGEMENT AGENCY

JB Pritzker
Governor

Alicia Tate-Nadeau
Director

Emergency Release Notification Fact Sheet

A. Immediate telephone notification shall be given by the owner or operator of a facility when a release equal to or exceeding the reportable quantity of an extremely hazardous substance(1) or a CERCLA hazardous substance(2) occurs at the facility.

In such incidents, notifications are to be made to the following:

1) Illinois Emergency Management Agency (IEMA)/State Emergency Response Commission (SERC) at 1-800-782-7860 (within state) or (217) 782-7860 (when calling from out-of-state);
2) Local Emergency Planning Committee (LEPC) that is likely to be affected by the release. The LEPC telephone number(s) may be obtained from the IEMA Website at http://www.illinois.gov/iema/Preparedness/SERC/Pages/default.aspx.
3) National Response Center (NRC) at 1-800-424-8802 (if the substance is a CERCLA hazardous substance).

Please Note: ***Transportation-related incidents only require 9-1-1 notification***.

B. Immediate telephone notification is also required if an incident or accident involving a hazardous material(3) occurs which results in:

1) a member of the general public is killed;
2) a member of the general public receives injuries requiring hospitalization;
3) an authorized official of an emergency agency recommends an evacuation of an area by the general public;
4) a motor vehicle has overturned on a public highway;
5) Fire, breakage, release or suspected contamination occurs involving an etiologic agent;
6) Any release of petroleum (or oil) that produces a sheen on nearby surface water(4) and/or threatens navigable waters;
7) Any spill or overfill of petroleum that results in a release to the environment that exceeds 25 gallons (25-gallon reporting threshold for USTs only)(4). ASTs are not subject to the 25-gallon spill reporting threshold in 41 IAC 176.340 but are subject to 29 IAC 430.

In such incidents, notification shall be made as noted in Paragraph A, above, except no notification is required to the NRC, except items 6 and 7 (oil that impacts water and overfills emanating from underground storage tanks).

At a minimum, notification shall include:

1) the chemical name or identity of any substance involved in the release;
2) an indication of whether the substance is an extremely hazardous substance;
3) an estimate of the quantity in pounds of any such substance that was released into the environment;
4) the time and duration of the release;
5) the specific location of the release;
6) the medium or media (air, land, water) into which the release occurred;
7) any known or anticipated acute or chronic health risks associated with theemergency and, where appropriate, advice regarding medical attention necessary for exposed individuals;
8) proper precautions to take as a result of the release, including evacuations;
9) the name and telephone number of the person or persons to be contacted for further information.

C. WRITTEN FOLLOW-UP NOTICE IS REQUIRED WITH RESPECT TO INCIDENTS AS DESCRIBED IN PARAGRAPH A, ABOVE. As soon as practicable after such release (within 30 days), the owner or operator shall provide a written follow-up emergency notice (or notices, as more information becomes available) to the SERC and the LEPC, updating the information provided in the immediate notification and including additional information with respect to:

1) Actions taken to respond to and contain the release;
2) Any known or anticipated acute or chronic health risks associated with the release;
3) Where appropriate, advice regarding medical attention necessary for exposed individuals.

1 See 40 CFR 355 for a listing of extremely hazardous substances (EHS)
2 See 40 CFR 302.4 for a listing of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) hazardous substances
3 See 49 CFR 172.101 for a list of hazardous materials
4 See 41 IAC 176.340 Reporting and Cleanup of Spills and Overfills (USTs).

(These rules are compiled in 29 IAC 430 and 29 IAC 620) ***rev. 12/2020***

APPENDIX E
ENGINEERING CALCULATIONS
(TANK VOLUME RESTRICTION AND
AVAILABLE SECONDARY CONTAINMENT

DEPARTMENT OF BUILDINGS

CITY OF CHICAGO

DATE: 2/13/2023

TO: Patrick Maloney, PE, Assistant Chief Engineer

FROM: Andrew Billing, PE, Lead Stormwater Reviewer

SUBJECT: Approval of Design Plans, dated: **1/30/2023**

Project Name: **Green Era Digester Plan Amendment-Secondary Containment**
Project Address: **650 W 83rd St**
DOB Permit Number:
Designer/Developer: **Terra Engineering**

☒ **Plan Approval.** The following size(s) of drain connection(s) to the main sewer(s) is/are acceptable for the subject property. Please check the plans for other permit requirements inside private property including covenants for joint maintenance.

☐ **Conditional Plan Approval.** The following size(s) of drain connection(s) to the main sewer(s) is/are acceptable for the subject property. However, the attached comments/mark-ups as noted **must** be incorporated into the final plans. Please verify that the plans have been revised as noted and check other permit requirements inside private property including covenants for joint maintenance.

Connection size and location:

No new connections.

Restrictor size and catch basin number and location:

No new restrictors; Backflow preventers to be installed on CB14A & CB8

Rate Control BMPs:

Total allowable operating volume of 80,483 cubic feet (602,057 gallons) is provided during a spill event.

Volume Control BMPs:

Not applicable for Secondary Containment.

Plan modifications described below (or shown on attached sheets) are required on the following sheet numbers:

Sheet(s) _____ _____

_____

Notes: _____

_____

_____

Stormwater Management Plan Review Fees:

The following stormwater review fee has been paid prior to this stormwater approval. (See Stormwater Ordinance, Article 11-18-080, for review fees.)

☐	$1,000.00	for regulated developments < 50,000 sq. ft.
☐	$3,000.00	for regulated developments >= 50,000 sq. ft.
☐	$1,500.00	for a variance request < 50,000 sq. ft.
☐	$4,500.00	for a variance request >= 50,000 sq. ft.
☐	$350.00	for a plan amendment submitted within one year of plan approval
☒	$500.00	for a plan amendment submitted over one year after plan approval
☐	No Fee Required, reason:	

Departmental requirements are subject to change. This record of approval is **valid for one year** from the date of issue indicated above. It is the designer's/developer's responsibility to field check the size, location, and invert elevation of existing sewers and other city-owned or private utilities prior to the start of construction.

Please be advised: this document is a stormwater design approval; **this is not a permit** to perform the work shown on the plans. The contractor must obtain all required permits prior to beginning construction including, but not limited to, the sewer permit, street opening permit, driveway permit, etc.

Originated by: **Benjamin Stammis, PE, V3 Companies, Stormwater Consultant** BTS
cc-Designer: **John Helfrich, PE, Terra Engineering**

PD Approval

TERRA ENGINEERING LTD.

DATE: June 14. 2022
Revised January 30, 2023

TO: Ben Stammis, PE
City of Chicago – Department of Buildings

FROM: John C. Helfrich, PE, ENV SP

SUBJECT: Green Era Digester – Secondary Containment
650 W. 83rd Street

TERRA Engineering (TERRA) has completed the following assessment for Green Era Sustainability in support of secondary containment measures for the Green Era Digester project located at the northwest corner of W. 83rd Street and N. Wallace Street in Chicago, Illinois. The purpose of this assessment is to determine the capacity of the site to contain a digester tank spill event to establish the maximum allowable operating volume of the digester tank.

Current Site Conditions

The project site is a former open field that has been redeveloped to include an industrial building, digester tanks, paved asphalt parking lots and drives, and a detention pond. The digester tank is situated in the northwest corner of the site, immediately north of the building, within a gravel equipment yard and surrounded by an asphalt drive with a curb and gutter system. The site drainage consists of a system of catch basins and storm sewers that convey runoff to an at-grade detention basin located at the southeast corner of the site, which ultimately discharges to the City's 45-inch combined sewer in 83rd Street.

The detention basin was originally designed to have a 100-yr volume of approximately 88,000 cubic feet at a high-water line (HWL) at 13.00 Chicago City Datum (CCD). An as-built survey was provided by DLZ Industrial Survey, Inc. on May 3, 2022, and TERRA used the current topography to determine the as-built detention provided at 13.00 CCD to be 87,787 cubic feet. Site volumes throughout this assessment were determined using 3D TIN surfaces created in AutoCAD Civil 3D 2020.

Interim Containment Conditions

Green Era is currently establishing an allowable operating volume for the digester with the Chicago Department of Public Health (CDPH). Per coordination with CDPH, this interim operating volume must not exceed the containment capacity that currently exists on-site. In the event of a tank failure, the digestate is anticipated to initially flow from the tank, through the on-site drainage system, and into the detention basin where a new plug valve will be operated to keep digestate from flowing into the City's sewer system. From there, on-site personnel will mobilize high-capacity pumps to remove digestate from the detention basin and pump into the building's basement for storage until it can be hauled to an approved location. The plug valve will then be reopened, and the detention basin will resume function as originally designed.

The above emergency response plan will dictate the allowable interim operating volume which must not exceed the lesser volume between the basement + spare tanks or the detention basin + sewer system. Approximate storage volumes in the basement and spare tanks have been provided by DAI Environmental, Inc. and included in the attached calculations. Calculations have also been provided showing the as-built volume of the detention basin and storage volume in the storm sewer system.

Stormwater Management

In addition to providing containment for the digestate volume, it is recommended to include provisions for a "first flush" rain event occurring at the same time as a spill. The City's Stormwater Spreadsheet Tool R4.1 02-15-2018 was manipulated to import the rainfall intensities for the Bulletin 70, 2-yr rain event ("first flush") and Tab 1.0 Rate Control was used to determine runoff volumes for different

scenarios. Per coordination with Green Era and their operator, we understand that a pump rate of 3,750 GPM will be provided by on-site pump(s) able to be immediately mobilized to the detention basin in the event of a spill.

Scenario 1: A 2-yr rain event occurs while the basin is full of digestate and being pumped into the basement.
Release Rate = 8.355 cfs (3,750 GPM)
Peak Volume = 10,611 cf (79,373 gal)

Scenario 2: A 2-yr rain event occurs while the basin is empty, but the plug valve is closed.
Release Rate = 0.000 cfs
Peak Volume = 86,892 cf (649,999 gal)

Scenario 1 determines the stormwater volume that should be accounted for in the containment capacity of the site and Scenario 2 shows that, even with the outlet of the detention basin plugged, the basin has adequate capacity to hold the 2-yr ("first flush") rain event.

Interim Site Mitigation

TERRA recommends installing a plug valve at the downstream outlet pipe of the basin that can be operated in case of a spill. Backflow preventors will be installed on incoming storm sewers to the basin that do not drain the area around the digester tanks (notably the northeast and west storm outfalls). Minor grading modifications are planned to ensure the detention basin does not overtop to the public right-of-way at the 100-yr HWL of 13.00 CCD. See attached exhibits for anticipated flood areas. A temporary barrier along the north property line is also proposed to ensure that, in the event of a catastrophic failure, digestate does not overtop the existing curb and flow to the north parcel.

All proposed site modifications will be reviewed with the City and permitted, as necessary. Any site modification will not impact the existing drainage patterns and/or the amount of rate control and volume control provided by the current stormwater permit.

Interim Volume Summary

	On-Site Containment Volume	Volume (gal)	Volume (cf)
1	Basin Volume @ 13.00 CCD	656,692 gal	87,787 cf
2	Sewer Pipes & Structure Volume	24,738 gal	3,307 cf
3	**Total Containment Volume**	**681,430 gal**	**91,094 cf**
	Building Containment Volume		
4	Volume in Basement	647,035 gal	86,496 cf
5	Volume in Spare Tanks	65,743 gal	8,789 cf
6	**Total Containment Volume**	**712,778 gal**	**95,285 cf**
	Stormwater Management		
7	2-yr Volume	79,373 gal	10,611 cf
8	**Total Allowable Operating Volume (3-7)**	**602,057 gal**	**80,483 cf**

Future Containment Conditions

Green Era is currently planning improvements to the adjacent parcel north of the digester tank. The conceptual plan includes the construction of an overland spillway, minor storm sewer modifications, and an excavated storage area that would provide containment for the full volume capacity of the digester tank in addition to all requirements of the CDPH rules regarding Landfills, Liquid Waste Handling Facilities and Transfer Stations. All proposed improvements beyond what is included within this memo will be submitted to DOB for further review and approval.

Conclusion

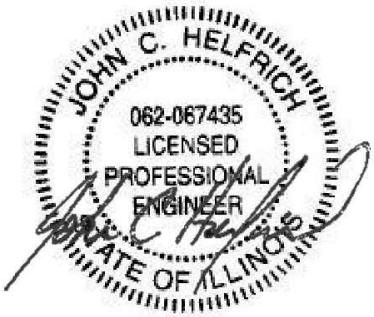
In the event of a digestate spill, interim secondary containment will be provided in the existing on-site drainage system and then immediately pumped into the building's basement and spare tanks for storage before ultimately being disposed of. To achieve the necessary site containment capacity, plug valves and backflow preventors will be required to ensure the spill does not overflow to the 83rd Street right of way. With the proposed modifications within this memo, the operating volume of the facility should be reduced so the containment volume required does not exceed the containment volume provided, until further site modifications can be made.

Should you have any questions or require any further information, please do not hesitate to reach out via email at jhelfrich@terraengineering.com or via phone at 312-467-0123.

Sincerely,
TERRA Engineering, Ltd.

John C. Helfrich, PE, ENV SP
Senior Project Manager

cc: Jason Feldman, Green Era Sustainability
Rick Vamos, DAI Environmental, Inc.



EXP: 11/30/23

Scale: 1 inch = 40 feet

VOLUME SUMMARY

	GALLONS	CUBIC FEET
ON-SITE CONTAINMENT VOLUME		
BASIN VOLUME @ 13.00 CCD (AS-BUILT HWL)	656,692	87,787
SEWER PIPES & STRUCTURE VOLUME	24,738	3,307
TOTAL CONTAINMENT VOLUME	**681,430**	**91,094**
BUILDING CONTAINMENT VOLUME		
AVAILABLE VOLUME IN BASEMENT	647,035	86,496
AVAILABLE VOLUME IN SPARE TANKS	65,743	8,789
TOTAL CONTAINMENT VOLUME	**712,778**	**95,285**
TOTAL ALLOWABLE OPERATION VOLUME	**681,430**	**91,094**

BASIN VOLUME TABLE

Contour Elevation (ft)	Contour Area (sq. ft)	Conic Incremental Volume (cu. ft)	Conic Cumulative Volume (cu. ft)
8.81	0	NA	0
9.00	170	11	11
10.00	20,161	7,394	7,405
11.00	25,323	22,693	30,098
12.00	28,832	27,058	57,156
13.00	32,465	30,630	87,787

TERRA ENGINEERING LTD.
225 W Ohio Street - Suite 400; Chicago, IL 60654
(T) 312-467-0123 | (F) 312-467-0220

SPILL VOLUME EXHIBIT - 13.00 CCD
GREEN ERA DIGESTER
01/05/2023 MBB

City of Chicago
Department of Water Management **1/22/2020**

Name of Project: Green Era Digester
Address: 650 W. 83rd Street
A/E of Record: Terra Engineering, Ltd.
Note: Proposed Areas contain both Phase 1 and Phase 2 of the project.

1.0 Rate Control (Sheet 1 of 2)

Step 1: **Runoff Calculation**

		Proposed Area (sq. ft.)	C-Value 100-Year	Storage Volume (cu. ft.)
Pervious Land	Lawns - Sandy soil, flat, 0% to 2%		0.18	
	Lawns - Sandy soil, avg, 2% to 7%		0.27	
	Lawns - Sandy soil, steep, >7%		0.36	
	Lawns - Heavy soil, flat, 0% to 2%		0.30	
	Lawns - Heavy soil, avg, 2% to 7%	154,709	0.42	
	Lawns - Heavy soil, steep, >7%		0.47	
	Woodlands, flat, 2%		0.39	
	Native Vegetation with prepared soils		0.10	
	Dry bottom basins to HWL	32,824	0.75	
	Wetland		0.80	
	Green Roof		0.50	
Impervious Land	Gravel	49,666	0.70	
	Pavement	104,329	0.95	
	Roofs (conventional)	46,374	0.95	
Food Digester with	Total	1	0.95	
	Wet bottom basins to HWL		1.00	
BMP areas	BMPs providing storage that WILL COUNT toward detention storage (from Worksheet 1.2)	0	1.00	
	BMPs providing volume control storage that WILL NOT BE COUNTED toward detention (from Worksheet 1.2)	0	Storage Provided will be used to factor the adjusted C-value in Cell D38	0

Summary	Total pervious area	187,533	sq ft		
	Total impervious area	200,370	sq ft		
	Total BMP area	0	sq ft		
	Total site area including sidewall	387,903	sq ft	8.91	acres
	Total site area excluding sidewall	387,902	sq ft	8.91	acres
	Weighted C- value (non BMP areas)	0.69	unitless		
	Adjusted C-value (accounts for BMPs)	0.00	unitless		
	Notes:	*Make note of any adjustments made for purposes of detention calcs here (such as removal of roof area that will discharge directly to Waters)*			

Step 2: **Allowable Release Rate Assessment**

		Type Yes or No for all that apply	Notes
Question 1:	Does the site drain directly to Waters?	No	
Question 2:	Does the site only include residential land use?	No	
Question 3:	Is the Regulated Development a Lot-to-Lot Buillding (85% or more of site footprint is occupied by buildings)?	No	
Question 4:	Do you plan to use the standard maximum release rate (only available to sites less than 1.75 acres)?	No	Complete Tab 0.0 Release Rate to calculate the allowable release rate for the site unless a 1 cfs/ac release rate to waters will be used.
Question 5:	Is the site more than 75 percent of substantially contiguous at-grade open space that is conducive to ponding of surface waters (Answer "No" if site discharges to waterway or is a service station)?	No	
Question 6:	Does the development involve flow diversions (existing sewer connection to be relocated to a different main) or multiple sewer connections (only available to sites over 1.75 acres)?	No	
Question 7:	Are there widespread contaminated soils on the site, high ground water table, or is this development classified as a lot-to-lot building?	Yes	Oversized detention is allowed to meet volume control requirements. After completing this worksheet, fill out Tab 2.1.9 to design oversized detention.

City of Chicago
Department of Water Mangement

Name of Project: Green Era Digester
Address: 650 W. 83rd Street
A/E of Record: Terra Engineering, Ltd.

1.0 Rate Control (Sheet 2 of 2)

Step 3: **Achieving Rate Control Measures**

Unadjusted Detention Release Rate =	0.000	cfs	Kostner	0.000
Dry Weather Flow Rate = (From dry weather flow worksheet)	0.000	cfs	Waiting for Dry Weather Flow worksheet to be completed	
Infiltration Facility Release Rate (to be added to eligible release rate when computing required storage)	0.000	cfs	No BMPs with infiltration beds entered on BMP Summary Worksheet or soil's infiltration rate is less than 0.5 in/hr	
Release rate for detention storage computations:	**8.355**	cfs		
Required Storage Volume =	10,611	cu ft		

Pump Rate = 3,750 GPM

Detention Storage Calculations
(Based on Bulletin 70 Rainfall Data)

STORM EVENT (5,10,25,50 or 100) = 2

Allowable release rate 8.355 cfs

Storm Duration (minute)	Runoff Coefficient C	Rainfall Intensity (in/hr)	Drainage Area A (acres)	Inflow Rate Q=CIA	Total Storm Vol (cu ft)	Release Rate Qo (cfs)	Storage Rate (Qi-Qo) (cfs)	Storage Volume Rate (Qi-Qo)*t*60 (cu ft)
5	0.69	4.320	8.91	26.53	7,960	8.355	18.18	5,453
10	0.69	4.020	8.91	24.69	14,814	8.355	16.33	9,801
15	0.69	3.280	8.91	20.14	18,130	8.355	11.79	10,611
30	0.69	2.240	8.91	13.76	24,763	8.355	5.40	9,724
60	0.69	1.430	8.91	8.78	31,617	8.355	0.43	1,539
120	0.69	0.895	8.91	5.50	39,577	8.355	-2.86	-20,579
180	0.69	0.647	8.91	3.97	42,893	8.355	-4.38	-47,341
360	0.69	0.380	8.91	2.33	50,411	8.355	-6.02	-130,057
720	0.69	0.220	8.91	1.35	58,370	8.355	-7.00	-302,566
1080	0.69	0.155	8.91	0.95	61,687	8.355	-7.40	-479,717
1440	0.69	0.127	8.91	0.78	67,214	8.355	-7.58	-654,658
2880	0.69	0.069	8.91	0.42	72,963	8.355	-7.93	-1,370,781
4320	0.69	0.049	8.91	0.30	78,490	8.355	-8.05	-2,087,126
7200	0.69	0.033	8.91	0.20	86,892	8.355	-8.15	-3,522,468
14400	0.69	0.000	8.91	0.00	1,824	8.355	-8.35	-7,216,896
							Required Detention Volume (cu ft)	10,611

Note: 1) the calculation assumes that the rising and recessing limb of inflow and outflow hydrograph are vertical

City of Chicago
Department of Water Management **1/22/2020**

Name of Project: Green Era Digester
Address: 650 W. 83rd Street
A/E of Record: Terra Engineering, Ltd.
Note: Proposed Areas contain both Phase 1 and Phase 2 of the project.

1.0 Rate Control (Sheet 1 of 2)

Step 1: **Runoff Calculation**

		Proposed Area (sq. ft.)	C-Value 100-Year	Storage Volume (cu. ft.)
Pervious Land	Lawns - Sandy soil, flat, 0% to 2%		0.18	
	Lawns - Sandy soil, avg, 2% to 7%		0.27	
	Lawns - Sandy soil, steep, >7%		0.36	
	Lawns - Heavy soil, flat, 0% to 2%		0.30	
	Lawns - Heavy soil, avg, 2% to 7%	154,709	0.42	
	Lawns - Heavy soil, steep, >7%		0.47	
	Woodlands, flat, 2%		0.39	
	Native Vegetation with prepared soils		0.10	
	Dry bottom basins to HWL	32,824	0.75	
	Wetland		0.80	
	Green Roof		0.50	
Impervious Land	Gravel	49,666	0.70	
	Pavement	104,329	0.95	
	Roofs (conventional)	46,374	0.95	
Food Digester with	Total	1	0.95	
	Wet bottom basins to HWL		1.00	
BMP areas	BMPs providing storage that WILL COUNT toward detention storage (from Worksheet 1.2)	0	1.00	
	BMPs providing volume control storage that WILL NOT BE COUNTED toward detention (from Worksheet 1.2)	0	Storage Provided will be used to factor the adjusted C-value in Cell D38	0

Summary	Total pervious area	187,533	sq ft		
	Total impervious area	200,370	sq ft		
	Total BMP area	0	sq ft		
	Total site area including sidewall	387,903	sq ft	8.91	acres
	Total site area excluding sidewall	387,902	sq ft	8.91	acres
	Weighted C- value (non BMP areas)	0.69	unitless		
	Adjusted C-value (accounts for BMPs)	0.00	unitless		
	Notes:	*Make note of any adjustments made for purposes of detention calcs here (such as removal of roof area that will discharge directly to Waters)*			

Step 2: **Allowable Release Rate Assessment**

		Type Yes or No for all that apply	Notes
Question 1:	Does the site drain directly to Waters?	No	
Question 2:	Does the site only include residential land use?	No	
Question 3:	Is the Regulated Development a Lot-to-Lot Buillding (85% or more of site footprint is occupied by buildings)?	No	
Question 4:	Do you plan to use the standard maximum release rate (only available to sites less than 1.75 acres)?	No	Complete Tab 0.0 Release Rate to calculate the allowable release rate for the site unless a 1 cfs/ac release rate to waters will be used.
Question 5:	Is the site more than 75 percent of substantially contiguous at-grade open space that is conducive to ponding of surface waters (Answer "No" if site discharges to waterway or is a service station)?	No	
Question 6:	Does the development involve flow diversions (existing sewer connection to be relocated to a different main) or multiple sewer connections (only available to sites over 1.75 acres)?	No	
Question 7:	Are there widespread contaminated soils on the site, high ground water table, or is this development classified as a lot-to-lot building?	Yes	Oversized detention is allowed to meet volume control requirements. After completing this worksheet, fill out Tab 2.1.9 to design oversized detention.

City of Chicago
Department of Water Mangement

Name of Project: Green Era Digester
Address: 650 W. 83rd Street
A/E of Record: Terra Engineering, Ltd.

1.0 Rate Control (Sheet 2 of 2)

Step 3: **Achieving Rate Control Measures**

Unadjusted Detention Release Rate =	0.000	cfs	Kostner	0.000
Dry Weather Flow Rate = (From dry weather flow worksheet)	0.000	cfs	Waiting for Dry Weather Flow worksheet to be completed	
Infiltration Facility Release Rate (to be added to eligible release rate when computing required storage)	0.000	cfs	No BMPs with infiltration beds entered on BMP Summary Worksheet or soil's infiltration rate is less than 0.5 in/hr	
Release rate for detention storage computations:	**0.000**	cfs	Assume plugged condition	
Required Storage Volume =	86,892	cu ft		

Detention Storage Calculations
(Based on Bulletin 70 Rainfall Data)

STORM EVENT (5,10,25,50 or 100) = 2

Allowable release rate 0.000 cfs

Storm Duration (minute)	Runoff Coefficient C	Rainfall Intensity (in/hr)	Drainage Area A (acres)	Inflow Rate Q=CIA	Total Storm Vol (cu ft)	Release Rate Qo (cfs)	Storage Rate (Qi-Qo) (cfs)	Storage Volume Rate (Qi-Qo)*t*60 (cu ft)
5	0.69	4.320	8.91	26.53	7,960	0.000	26.53	7,960
10	0.69	4.020	8.91	24.69	14,814	0.000	24.69	14,814
15	0.69	3.280	8.91	20.14	18,130	0.000	20.14	18,130
30	0.69	2.240	8.91	13.76	24,763	0.000	13.76	24,763
60	0.69	1.430	8.91	8.78	31,617	0.000	8.78	31,617
120	0.69	0.895	8.91	5.50	39,577	0.000	5.50	39,577
180	0.69	0.647	8.91	3.97	42,893	0.000	3.97	42,893
360	0.69	0.380	8.91	2.33	50,411	0.000	2.33	50,411
720	0.69	0.220	8.91	1.35	58,370	0.000	1.35	58,370
1080	0.69	0.155	8.91	0.95	61,687	0.000	0.95	61,687
1440	0.69	0.127	8.91	0.78	67,214	0.000	0.78	67,214
2880	0.69	0.069	8.91	0.42	72,963	0.000	0.42	72,963
4320	0.69	0.049	8.91	0.30	78,490	0.000	0.30	78,490
7200	0.69	0.033	8.91	0.20	86,892	0.000	0.20	86,892
14400	0.69	0.000	8.91	0.00	1,824	0.000	0.00	1,824
							Required Detention Volume (cu ft)	86,892

Note: 1) the calculation assumes that the rising and recessing limb of inflow and outflow hydrograph are vertical

Project: Green Era Secondary Containment
Title Pipe & Structure Storage
Date: 1/5/2023

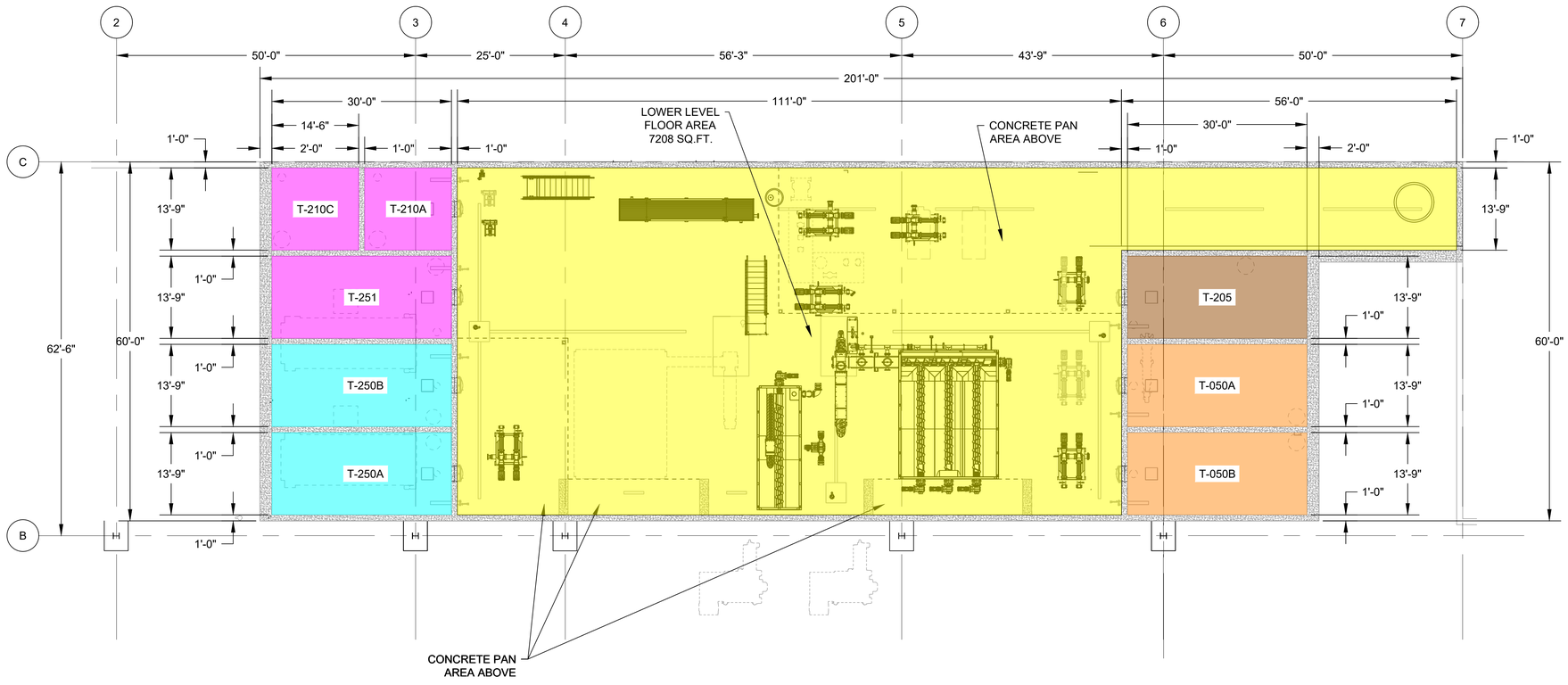
TERRA ENGINEERING LTD.
225 West Ohio Street, 4th Floor
Chicago, Illinois 60610
T:(312)467-0123 F:(312) 467-0220

Calc: MBelongilot
Check: JHelfrich

Stormwater Pipes		
Length (ft)	**Diameter (ft)**	**Volume (CF)**
52	0.5	**10.21**
81	0.67	**28.55**
520	1	**408.33**
319	1.5	**563.61**
164	2	**515.12**
318	2.5	**1,560.68**
Total		**3,086.51**

Stormwater Structures								
Structure Label	**Diameter (ft)**	**RIM (CCD)**	**HWL (CCD)**	**Bottom of Flat Top (RIM - 18")**	**Bottom of Conical Section (RIM-2'-10")**	**Invert**	**Barrel Volume (CF)**	**Total Volume (CF)**
7A	4.0	**16.20**	**13.00**	N/A	13.37	10.07	36.80	39.60
7	4.0	**15.34**	**13.00**	N/A	12.51	10.31	27.59	30.39
6	4.0	**15.34**	**13.00**	N/A	12.51	10.56	24.45	27.25
3A	4.0	**14.71**	**13.00**	N/A	11.88	10.86	12.77	15.57
3	4.0	**13.41**	**13.00**	11.91	N/A	10.91	12.56	15.36
4	4.0	**13.35**	**13.00**	11.85	N/A	11.19	8.29	11.09
2	4.0	**16.81**	**13.00**	N/A	13.98	11.26	21.85	24.65
2	4.0	**15.55**	**13.00**	N/A	12.72	11.50	15.28	18.08
2A	4.0	**16.95**	**13.00**	N/A	14.12	13.40	0.00	2.80
3	4.0	**17.00**	**13.00**	N/A	14.17	10.82	27.38	30.18
6A	4.0	**16.90**	**13.00**	N/A	14.07	13.05	0.00	2.80
6B	4.0	**16.75**	**13.00**	N/A	13.92	13.70	0.00	2.80
Total								**220.58**

Pipe & Structure Volume Provided 3,307 CF



NAME	DESCRIPTION	LENGTH FT	WIDTH FT	DEPTH FT	CAPACITY FT^3	CAPACITY GAL.	SERVICE
	LOWER LEVEL (MAIN AREA)	111	58	12	77,256		-
	LOWER LEVEL (PIPING TUNNEL)	56	13.75	12	9,240		-
	LOWER LEVEL (TOTAL)				86,496	647,035	-
T-050A	LIQUID RECEIVING TANK	30	13.75	10.83	4,469	33,429	FEEDSTOCK
T-050B	LIQUID RECEIVING TANK	30	13.75	10.83	4,469	33,429	FEEDSTOCK
T-205	SCREENED DIGESTATE TANK	30	13.75	10.83	4,469	33,429	DIGESTATE
T-210A	BULK POLYMER/SPARE TANK	14.5	13.75	10.83	2,160	16,157	SPARE
T-210C	BULK POLYMER/SPARE TANK	14.5	13.75	10.83	2,160	16,157	SPARE
T-250A	BELT PRESS FILTRATE TANK	30	13.75	10.83	4,469	33,429	FILTRATE
T-250B	BELT PRESS FILTRATE TANK	30	13.75	10.83	4,469	33,429	FILTRATE
T-251	SPARE TANK	30	13.75	10.83	4,469	33,429	SPARE
					TOTAL	879,921	

TOTAL BASEMENT VOLUME

TOTAL SPARE TANK VOLUME
65,743 GAL (8,789 CF)

DIGESTER BUILDING LOWER LEVEL TANKAGE & BASEMENT VOLUMES

SCALE: 3/32" = 1'-0"

3/32" = 1'-0"

2' 1' 0 2' 4' 6' 8' 12' 16' 24'

NO.	DATE
BY	
REVISION	
NO.	DATE
BY	
REVISION	
NO. 1	DATE 9/1/2022
BY BR	
REVISION REPLACED CHART FLOOR AREA COLUMN WITH LENGTH AND WIDTH COLUMNS	

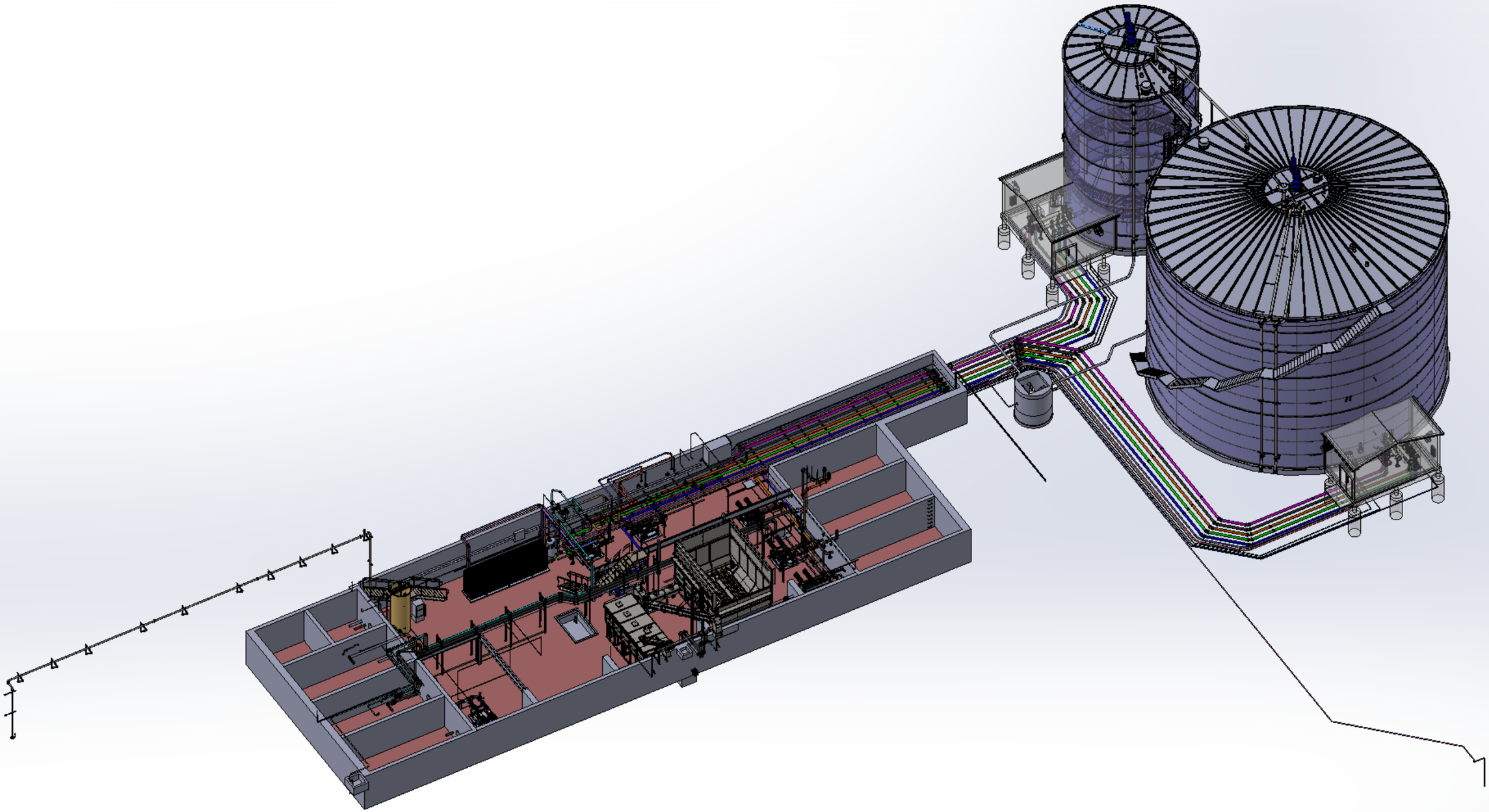
ACEng
ADAMS & CHRISTENSEN ENGINEERING, INC.
7762 WEXFORD CT.
GRAYSLAKE, ILLINOIS 60030
CERTIFICATE OF AUTHORIZATION NO. 05379

GREEN ARROW
2759 LONG ROAD
WOOSTER, OH 44691

DIGESTER BUILDING
LOWER LEVEL TANKAGE & BASEMENT VOLUME

GREEN ERA
650 W. 83RD ST.
CHICAGO, IL 60620

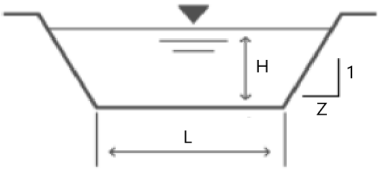
AREA	CHECKED BY NM
JOB NO. 1512	DRAWN BY BR
SCALE SEE NOTE	DATE 5/4/2022
DWG NO.	
SHEET NO. O-510	



Project: Green Era Secondary Containment
Title Overflow Weir Flow Rate
Date: 1/25/2023

TERRA ENGINEERING LTD.
225 West Ohio Street, 4th Floor
Chicago, Illinois 60610
T:(312)467-0123 F:(312) 467-0220

Calc: MBelongilot
Check: JHelfrich



Trapezoidal Weir Release Rate (Q) =	$CLH^{1.5} + \frac{4}{5}CZH^{2.5}$	
Crest Length (L) =	15	ft
Weir Height (H) =	0.33	ft
Side Slope (Z) =	3	:1
Weir Coefficient (C) =	3.0	(MWRD TGM 5-73)
Provided Release Rate (Q) =	8.98	cfs
Site Area =	8.91	
Required Release Rate =	1	cfs/ac
=	8.91	cfs

APPENDIX F
FACILITY INSPECTION FORMS

Daily Tank Inspection Log

1. Check tanks for leaks, specifically looking for:
   drip marks, discoloration of tanks, puddles containing spilled or leaked material
   corrosion, cracks, and localized dead vegetation.

2. Check foundation for:
   cracks, discoloration, puddles containing spilled or leaked material
   settling, gaps between tank and foundation, and damage caused by vegetation roots.

3. Check piping for:
   droplets of stored material, discoloration, corrosion, bowing of pipe between supports;
   evidence of stored material seepage from valves or seals, and localized dead vegetation.

Inspector	Tank	Date	Comments

COPY AS NEEDED **Maintain for a period of at least 3-years**

Daily Secondary Containment Checklist

1. Dike or berm system.
   Level of precipitation in dike/available capacity, Operational status of drainage valves, Dike or berm permeability, Debris, Erosion, Permeability of the earthen floor of diked area, and Location/status of pipes, inlets, drainage beneath tanks.

2. Secondary containment
   Cracks, Discoloration, Presence of spilled or leaked material (standing liquid), Corrosion, and Valve conditions.

3. Retention and drainage ponds
   Erosion, Available capacity, Presence of spilled or leaked material, Debris, and Stressed vegetation.

Inspector	Containment Area	Date	Comments

COPY AS NEEDED **Maintain for a period of at least 3-years**

FACILITY RESPONSE EQUIPMENT CHECKLIST

Check Response Equipment for the following:

1. Inventory (item and quantity);
2. Storage location;
3. Accessibility (time to access and respond);
4. Operational status/condition;
5. Actual use/testing (last test date and frequency of testing); and
6. Shelf life (present age, expected replacement date).

Please note any discrepancies between this list and the available response equipment.

Equipment Inspected	Inventory (Quantity)	Access Time	Storage Location	Operational Status	Last Test/ Test Frequency	Shelf Life	Other Comments

Inspector's Signature: _____ Inspection Date: _____

COPY AS NEEDED **Maintain for a period of at least 3-years**

Monthly Facility Inspection Log

Date of Inspection: _____

STORAGE/TRANSFER AREAS	Tanks/ Containers Exterior	Spill Containment Equipment	Supports, Cradles	Piping/ Hoses	Connections/ Valves	Secondary Containment Condition	Containment Drainage Needed	Spillage Observed	Housekeeping/ Signage	# Drums	Comments
Tanks											
T-050A (30,000-gal liquid food waste/FOG/rinse water)											
T-050B (30,000-gal liquid food waste/FOG/rinse water)											
Tanker Truck Tranfer Area											
T-065A (5,500-gal food waste slurry)											
T-100 (320,000-gal food waste slurry)											
T-105 (1,680,000-gal digestate)											
T-205 (30,000-gal digestate)											
T-250A (30,000-gal filtrate)											
T-250B (30,000-gal filtrate)											
T-400A (55-gal glycol)											
T-400B (238-gal glycol)											
Unregulated Tanks: Inspection not required; complete if necessary											
T-210A (14,000-gal empty)											
T-210B (2,000-gal water with diluted polymer)											
T-210C (14,000-gal empty)											
T-251 (30,000-gal empty)											
Drum Storage Areas											
Oil, small-volume containers (<55-gal) - Processing Building											
Used oil drums (55-gal) - Processing Building											
Ethylene glycol totes (275-gal) - Processing Building											
Used glycol drums (55-gal) - Processing Building											
Undiluted polymer/mineral oil emulsion totes (275-gal) - Processing Building											
Transformers											
Pad-mounted, west											
Pad-mounted, north											
Other Areas/Facility General/Process Equipment											

Monthly Facility Inspection Log

Date of Inspection: _____

STORAGE/TRANSFER AREAS	Tanks/ Containers Exterior	Spill Containment Equipment	Supports, Cradles	Piping/ Hoses	Connections/ Valves	Secondary Containment Condition	Containment Drainage Needed	Spillage Observed	Housekeeping/ Signage	# Drums	Comments

Indicate as Adequate = YES or Not Adequate = NO

NOTE - Add comments as necessary (e.g., damage, vegetation, maintenance requirements, spills, valves, fill port locks, etc.)

Inspector: _____

APPENDIX G
TRAINING AND TESTING LOGS

SPCC ANNUAL REVIEW LOG

The following employees have reviewed and been trained on the details of this SPCC Plan.

Name	Signature	Date of Review

CERTIFICATION

Name: _____ Signature: _____

Title: _____ Date: _____

COPY AS NEEDED

This record must be maintained for a minimum of 3-years.

PERSONNEL RESPONSE TRAINING LOG/REFRESHER TRAINING LOG

The following employees have been received the necessary **minimum** response training or annual refresher training as detailed in Section 9.0 of the SPCC Plan.

Name	Signature	Date of Training/Refresher	Number of Hours

CERTIFICATION

Name: _____ Signature: _____

Title: _____ Date: _____

COPY AS NEEDED

This record must be maintained for a minimum of 3-years.

PERSONNEL PREVENTION TRAINING LOG/REFRESHER TRAINING LOG

The following employees have been received the necessary **minimum** spill prevention training or annual refresher training as detailed in Section 9.0 of the SPCC Plan.

Name	Signature	Date of Training/Refresher	Number of Hours

CERTIFICATION

Name: _____ Signature: _____

Title: _____ Date: _____

COPY AS NEEDED

This record must be maintained for a minimum of 3-years.

ANNUAL DISCHARGE PREVENTION MEETING LOG

SIGN IN SHEET

Name/Signature	Company/Position	Date of Training

Subject/issue identified	Required action	Implementation date

(Note: Required topics must include SPCC Plan.)

CERTIFICATION

Name: _____ Signature: _____

Title: _____ Date: _____

COPY AS NEEDED

This record must be maintained for a minimum of 3-years.

RESPONSE EQUIPMENT TESTING AND DEPLOYMENT DRILL LOG

Date: _____

Last Inspection or Response Equipment Test Date: _____

Inspection Frequency: _____(monthly)

Last Deployment Drill Date: _____

Response Time of Emergency Personnel: _____

Deployment Frequency: _____

Oil Spill removal Organization Certification (if applicable): _____

CERTIFICATION

Name: _____ Signature: _____

Title: _____ Date: _____

COPY AS NEEDED

This record must be maintained for a minimum of 3-years.

ATTACHMENT 16
CLOSURE PLAN

ENVIRONMENTAL

Environmental Engineers, Geologists and Scientists

Tel 847.573.8900
Fax 847.573.8953

Polo Park Business Center
27834 N. Irma Lee Circle
Lake Forest, Illinois 60045-5130

CLOSURE PLAN
GREEN ERA RENEWABLE ENERGY & URBAN FARMING CAMPUS
650 WEST 83RD STREET
CHICAGO, ILLINOIS 60620-1937

DOC. NO. MP-05

March 31, 2021

Revision: March 3, 2023 (revision of previous 12/13/21 Version)

Prepared For:
Green Era 83rd Street, LLC
218 North Jefferson Street, Suite 300
Chicago, Illinois 60661-1307

Prepared By:
DAI Environmental, Inc.
27834 North Irma Lee Circle
Lake Forest, Illinois 60045

TABLE OF CONTENTS

LIST OF APPENDICES

Illinois Environmental Protection Agency

Bureau of Land • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Closure Plans and Post-Closure Care Plans
(LPC-PA11)

This form, along with the General Application for Permit Form (LPC-PA1), should be included in permit applications proposing the initial closure plan, and post-closure care plan if applicable, for waste management units subject to 35 IAC Parts 807 or 832. It does not need to be used in permit applications proposing to modify closure or post-closure care plans that have already been approved through the permit process. To modify an existing plan, identify the type of submission as a Supplemental (35 IAC Part 807) on the General Application for Permit form.

Hand-delivered Permit applications must be delivered between 8:30 am and 5:00 pm, Monday through Friday (excluding State holidays) to:

Bureau of Land, Permit Section, Mail Code #33
1021 North Grand Avenue East, P.O. Box 19276
Springfield, IL 62794-9276

You may also complete this form online, save a copy locally, print, and submit it to the Bureau of Land, Permit Section at the above address.

Site Identification

Site Name: Green Era Renewable Energy and Urban Farming Campus IEPA BOL Number: 0316715228

Street Address: 650 West 83rd Street P.O. Box: _____

City: Chicago State: IL Zip Code: 60620-1937 County: Cook

Permit No.: 2021-167-DE for original DE, if obtained.

1. Identify the type of waste management unit that the plan addresses:

☐ Disposal ☐ WasteTreatment ☐ Storage/Transfer ☒ Composting

Provide a map or plan that clearly delineates each of the above. If more than one unit exists for each category, make sure to clearly designate each individual unit.

2. Was the interim formula for 35 IAC 807.624 previously used to prepare a cost estimate?

☐ Yes ☒ No

Cover Information

3. For disposal unit(s) provide a map which clearly indicates:

A. Those areas (or units) which are documented as having final cover (as defined in IAC 807.305(c)) applied. Provide date(s) when final cover was completed. NOTE: This box will expand as needed.

Not Applicable

Estimated date that cover was or will be applied: _____ The total area (in acres): _____

Average depth of refuse in each area: _____

Provide the bottom elevation (MSL): _____ Provide the final elevation (MSL): _____

Estimated date of final closure: _____

B. Those areas which are documented as having intermediate cover in place (as defined in 35 IAC807.305(c)). Provide date(s) when intermediate cover was completed. NOTE: This box will expand as needed.

Not Applicable

Estimated date that cover was or will be applied: _____ The total area (in acres): _____

Average depth of refuse in each area: _____

Provide the bottom elevation (MSL): _____ Provide the final elevation (MSL): _____

Estimated date of final closure: _____

C. Any areas currently permitted, or proposed to be permitted, which will require any additional cover. NOTE: This box will expand as needed.

Not Applicable

Estimated date that cover was or will be applied: _____ The total area (in acres): _____

Average depth of refuse in each area: _____

Provide the bottom elevation (MSL): _____ Provide the final elevation (MSL): _____

Estimated date of final closure: _____

Closure

The following information must accompany the application. Please indicate the location in the application for the document being submitted for this application. (Refer to 35 IAC 807.502 and 807.503)

Page number or location of information:

4. For disposal and/or indefinite storage units, provide a closure plan which addresses or provides the following:

Not Applicable — A. The location of the source and type of cover material to be used. Provide information for the quality and quantity to be used.

Not Applicable — B. The design specifications to be used in construction of the cap to include compacted depth of each lift, total depth, etc.

Not Applicable — C. The testing and documentation procedures to be used to insure the approved design specifications have been met.

Not Applicable — D. Recordkeeping and certification of test results

Not Applicable — E. The source and type of material to be used for a vegetative layer (on top of the compacted layer).

Not Applicable — F. The total depth of the vegetative layer. The depth selected for the vegetative layer must be accompanied by a discussion demonstrating it will be adequate to:

Not Applicable — 1. Provide moisture for cover species;

Not Applicable — 2. Prevent root penetration into the cover based on the species of vegetation selected; and

Not Applicable — 3. Support the planted species without continued maintenance.

Not Applicable — G. Any gas control system that will be provided prior to post-closure care. Include monitoring and collection or venting systems.

Not Applicable

H. Calculations and cross-sections for the design of the system that will prevent run-on and run-off from affecting the closed unit(s) during the post-closure care period. Include a map showing the drainage and erosion control system design for control of run-on and run-off.

Not Applicable

I. A plan to be followed in case of premature final cover closure and temporary showdown of the unit(s). This should identify the specific differences between routine and premature closure.

Not Applicable

J. A description and justification of any waste to be accepted for use in closure or post-closure care.

K. A schedule of the closure activities to include:

Not Applicable

1. Placement of final cover;

Not Applicable

2. Placement of vegetative layer; and

Not Applicable

3. Seeding, fertilizing and mulching

Not Applicable

L. A procedure to evaluate all monitoring data collected during the active life. This should be able to demonstrate that facility at closure is not causing nor contributing to violations of the Act or 35 IAC Part 807.

5. For composting, treatment or storage/transfer units, provide a closure plan which addresses the following;

See written plan

A. The maximum amount of waste that could be at the facility at the time of closure.

See written plan

B. The plan for removal of the waste material.

See written plan

C. The methods to decontaminate any remaining facilities or equipment.

See written plan

D. A schedule and recordkeeping procedures to be followed.

See written plan

E. A plan to be followed in case of premature final closure and temporary shutdown of the unit(s). This should identify the specific differences between routine and premature closure.

Post-Closure

Applicable to non-hazardous waste landfills subject to 35 IAC 807.

Page number or location of information:

Not Applicable

6. Indicate the number of years post-closure will be provided. _____

Not Applicable

7. Describe the inspection program that will be followed to monitor the site for subsidence, cracks, erosion, establishment of vegetation and gas migration. This should include frequency of inspections, and what procedures will be followed during the inspection. The frequency should be quarterly at a minimum and additional inspections when needed.

Not Applicable

8. Describe the quantitative criteria which will be used to determine what problems discovered during the inspection will require corrective action.

Not Applicable

9. Describe what corrective actions will be taken to correct each type of problem that is discovered.

Not Applicable

10. Discuss any proposed changes to the groundwater monitoring program applicable during closure/ post-closure.

Not Applicable

11. Describe what recordkeeping procedures will be used to document site inspections, problems found, corrective actions taken, groundwater monitoring results, leachate monitoring, impact of the site on groundwater, etc.

Not Applicable

12. Describe the security measures that will be provided to prevent unauthorized entry to the site during the post-closure care period.

Not Applicable

13. Provide a procedure to evaluate all data collected during the post-closure care period. This should be able to demonstrate that the site will not cause future violations of the Act or 35 IAC 807.

Closure Cost Estimates

(Note: Pursuant to 35 IAC 807.621(d) the cost provided below must be based on the assumption that the Agency will contract with a third party for implementation of the closure plan and post-closure plan. Refer to 35 IAC 807 Subpart F).

Provide a cost estimate of the following elements required under the closure plan. (Note: If closure plan is for more than one unit provide separate cost estimates for each unit.) Each estimate must provide details as to how the estimate was derived.

Page number or location of information:

14. For disposal and indefinite storage facilities, provide:

Not Applicable — A. The costs to obtain, move and place the cover material (this should include an estimate of the area requiring final cover).

Not Applicable — B. The cost for inspection and certification of final cover construction details.

Not Applicable — C. The cost to obtain, move and place the vegetative cover (top soil).

Not Applicable — D. The cost to monitor for gas and install any gas control system.

Not Applicable — E. The cost to install the run-on and run-off control system.

Not Applicable — F. The cost of fertilizing, seeding and mulching the vegetative layer.

Not Applicable — G. The cost of certification of closure, utilizing the Agency closure certification forms.

Not Applicable — H. Total cost of the above.

15. For storage/transfer , treatment or composting involving indefinite storage units, provide:

See Written Plan — A. The cost to remove all waste and decontaminate the facility.

See Written Plan — B. The cost to treat, or dispose of, or complete composting of the waste, at an offsite facility.

See Written Plan — C. The cost to certify completion of closure activities utilizing Agency closure certification forms.

See Written Plan — D. total cost of the above.

16. Post-Closure Cost Estimates:

For facilities requiring post-closure care, provide:

Not Applicable — A. The cost for inspection and recordkeeping for subsidence, cracks, erosion, establishment of vegetation, gas migration and leachate collection monitoring.

Not Applicable — B. The estimated frequency and cost of repairing any problems discovered.

Not Applicable — C. The cost to monitor the groundwater and leachate (include sample collection and analytical costs). Leachate removal and disposal costs should also be provided, if applicable.

Not Applicable — D. The cost to review groundwater data and assess impacts.

Not Applicable — E. The cost of recordkeeping for all data.

Not Applicable — F. The cost for annual mowing of the site.

Not Applicable — G. The cost to maintain a gas control system.

Not Applicable — H. The cost to certify the end of post-closure care utilizing the Agency post-closure care certification forms.

Not Applicable — I. Total cost of the above.

Not Applicable — 17. Based on the cost estimates for closure and, if applicable, post-closure care provided above, attach a new/revised financial assurance document for these costs. **Use ORIGINAL Agency forms**.

Not Applicable — 18. If providing trust funds, submit a current status report, including any calculations for annual reports.

1.0 INTRODUCTION

Green Era 83rd Street, LLC will operate a food waste (solid and liquid) recycling facility addressed as 650 West 83rd Street in Chicago, Illinois. The facility will receive food waste into a Processing Building with concrete floor and will additionally process the food waste in two (2) exterior aboveground storage tanks (ASTs): a biomass equalization tank and an anaerobic digester AST. The Illinois Environmental Protection Agency (Illinois EPA) views the anaerobic digestion of food waste process as "in-vessel composting," and defines "composting" as "the biological treatment process by which microorganisms decompose the organic fraction of waste, producing compost." The Illinois EPA further defines "compost" as the humus-like product (solid) of the process of composting waste, which may be used as a soil conditioner." Finished product compost may be temporarily stockpiled inside the Compost Loading and Handling Building (Pole Barn) building with concrete pad floor when not shipped off-site immediately (typical operations). No outdoor storage or transfer operations will be conducted at the facility. The below information provides a *Closure Plan* written consistent with the applicable requirements of 35 IAC 807.503 and requested in Sections 5 and 15 of Illinois EPA LPC-PA11 form.

2.0 CLOSURE PLAN

2.1 ROUTINE CLOSURE

Under the routine (planned) Closure scenario, the facility would cease accepting wastes, and would process through the already-received wastes, such that very little material would be left on-site to manage. No "raw" food waste (i.e., untreated and unprocessed organic materials) should remain if the facility were pursuing a planned closure, because all waste import would be terminated in advance. The digestate would be dewatered and the filtrate discharged to the Metropolitan Water Reclamation District (MWRD) under an existing Discharge Authorization. The dewatered digestate cake (i.e., the finished product created by the 2-stage belt press dewatering process) that might be stored in the Compost Loading and Handling Building (Pole Barn) isn't a "waste," and it is assumed the material would be suitable for agronomic benefit as a soil amendment (if not for sale) as it would be during normal operations. However, in the Closure Costs section, the costs to

transport the material off-site are included. Also, the polymer used to aid in the dewatering of the digestate would all be used by dewatering of the remaining digestate. Therefore, the only materials remaining to be disposed would be some glycol, some virgin and used gear oil and hydraulic oil, activated carbon, and PSA media.

5.A) The maximum amount of waste that could be at the facility at the time of closure.
5.B) The plan for removal of the waste.

The following table summarizes the materials to be managed at routine closure and the plan for removal.

Waste Type	Storage Location	Waste Amount/Volume	Plan for Removal
"Raw" waste - solid	Processing Building floor, concrete	None	Not Applicable
"Raw" food waste - solid	Live-bottom Receiving Bunker	None	Not Applicable
"Raw" pumpable food waste & wash down water - liquid	Concrete ST (2)	None	Not Applicable
Mixed waste - Homogenized liquid slurry	Grit hopper	None	Not Applicable
Partially "treated" waste (Feedstock) - liquid	Biomass Equalization AST	None	Not Applicable
Partially "treated" waste (Conditioned Feedstock) – liquid	Digester AST	None	Not Applicable
Wastewater (Digestate)	Concrete ST	None	Not Applicable
Wastewater (Filtrate)	Concrete ST (2)	None	Not Applicable
Unused polymer	AST (1)	None	Not Applicable
Finished product (compost "cakes") and wood chips/coir	Pole Barn floor, concrete	None	Not Applicable
Non-Food Solid Wastes (activated carbon, PSA media)	Within the operating equipment	32-yd^3 (carbon) 4-yd^3 (PSA media)	Disposal at a licensed special or non-special waste landfill
Glycol (virgin + diluted)	Processing Building (main floor, southern portion); Heat exchanger tanks (2)	600-gallons	Disposed at a licensed liquid waste disposal facility
Virgin Gear and Hydraulic Oil	Processing Building (main floor, southern portion)	600-gallons	Transport to oil recycler
Used Gear and Hydraulic Oil	Processing Building (main floor, southern portion)	300-gallons	Transport to oil recycler

AST – aboveground storage tank
ST – sub-grade storage tank

5.C) The methods to decontaminate any remaining facilities or equipment.

All of the wastes brought to the facility will be non-hazardous liquids and solids that were diverted from a municipal landfill or wastewater treatment facility. Therefore, decontamination of the facility and equipment under this Routine Closure Scenario should not require more than a simple pressure wash-down with water and then discharge of the wash-down water to the Metropolitan Water Reclamation District of Greater Chicago (MWRD) under the existing Discharge Authorization (as the wash down water would be suitable for discharge to the MWRD under the existing Discharge Authorization). It is assumed that a third-party emergency response contractor would be engaged to perform portions of the decontamination. A more detailed listing of the steps and schedule for decontamination, decommissioning, and closure, is provided in Appendix A. The associated costs are discussed in Section 3.1.

5.D) A schedule and recordkeeping procedures to be followed.

As detailed in a Gantt Chart provided in Appendix A, it is presumed that closure and decontamination can be completed in approximately 5.5-weeks (including the time to dewater the contents of the digester). Recordkeeping will be limited to simple waste tracking (e.g., bill of lading) and any recordkeeping/reporting requirements associated with the discharge authorization with the sanitary district. Additional recordkeeping may include any requirements specified in permits obtained from the Illinois EPA and/or City of Chicago. The Closure Activities will be documented in a Closure Report prepared and Certified by a Professional Engineer.

2.2 PREMATURE CLOSURE OR TEMPORARY SHUTDOWN

5.E) A plan to be followed in case of premature final closure and temporary shutdown of the unit(s). The plan should identify the specific differences between routine and premature closure.
5.A) The maximum amount of waste that could be at the facility at the time of closure.
5.B) The plan for removal of the waste

Routine Closure was discussed in Section 2.1. Under the Premature Closure scenario, it is assumed that the facility for some reason must suddenly cease operating, and as a result, the maximum quantities of waste and product that could be at the facility are presumed to be present at the facility

at the time of premature closure, some of which cannot be processed, but rather, must be removed from the facility for off-site management or disposal in accordance with all regulations.

With respect to "temporary shutdown" Closure, the amounts of wastes stored and requiring management would depend on the nature and causes of the "temporary shutdown," and the duration of the shutdown. For example, it can be assumed that under a temporary closure, receiving of wastes would immediately cease. But the plan to deal with and manage the "raw wastes" present within the building, and the liquids in the equalization tank and the digester tank, would depend on the duration of the "temporary closure." If "temporary" meant a few days, and during that time, the flare could be operated to manage the generated biogas, then practically no actions would have to be taken, as the solid and liquid wastes in the building, and the materials in the large ASTs outside the building, could basically continue to be stored within the building/tanks. But on the other end of the spectrum (i.e., a "worst-case" temporary closure), it might be necessary to cease operating the digester, and remove and/or process all of the liquids in the tanks and all of the raw and partially processed wastes within the building, which would then mirror the steps/costs for Premature Closure. As such, the Premature Closure and Temporary Closure scenario will henceforth in this Plan be viewed as the same. The following is assumed with respect to the ultimate disposition and handling of wastes and materials under Premature Closure:

- With the exception of the Digestate, Polymer, and the Finished Product Cake, all remaining materials present at the moment of "premature closure" will be transported off site and disposed at an appropriate and permitted off-site facility. This includes all unprocessed solid food waste, and the contents of the feedstock equalization tank (320,000-gallons). Such locations could include other permitted food waste composting facilities (examples include Christiansen Farms in Peotone, or Midwest Organics Recycling in McHenry) or (for the liquids) publicly owned treatment works with operating digesters that are willing for a fee to accept high strength liquid food wastes that are delivered to them. Further details regarding the assumed destinations for these materials are listed in the table below.
- Digestate will be managed by dewatering using facility personnel and directing the filtrate to the facility's wastewater outfall for discharge to the MWRD under the Discharge Authorization for the Facility. The dewatered digestate cake (estimated in Appendix B at 1,426-tons) will be transported off-site to permitted compost facilities for subsequent use as compost. Decontamination will be accomplished by engaging a third-party contractor.

The table below lists the types and quantities of materials to be addressed under the Premature Closure and/or Temporary Closure, scenarios.

Waste Type	Storage Location	Waste Amount/Volume	Plan for Removal
"Raw" waste - solid	Processing Building floor, concrete	4 loads, 60-yd^3	Disposed at another compost facility
"Raw" food waste - solid	Live-bottom Receiving Bunker	40-yd^3	Disposed at another compost facility
"Raw" pumpable food waste & wash down water - liquid	Concrete ST (2)	60,000-gallons (total)	Delivered to a POTW
Mixed waste - Homogenized liquid slurry	Grit hopper	5,500-gallons	Delivered to a POTW
Partially "treated" waste (Feedstock) - liquid	Biomass Equalization AST	320,000-gallons	Delivered to a POTW
Partially "treated" waste (Conditioned Feedstock) - liquid	Digester AST	1,680,000-gallons	Dewatered on-site by 3rd party contractor, filtrate discharged to MWRD, dewatered digestate donated/used as compost.
Wastewater (Digestate)	Concrete ST	30,000-gallons	Same as above
Wastewater (Filtrate)	Concrete ST (2)	30,000-gallons (each)	Discharged to MWRD under existing authorization
Unused Polymer	AST (1)	None (will be used to assist dewatering of digestate)	Will be used, no need for disposal
Finished product (compost "cakes") and wood chips/coconut husks	Pole Barn floor, concrete	1,426-tons (not all generated and stored at once, but over the closure)	Transported to off-site facilities permitted to accept compost
Non-Food Solid Wastes (activated carbon, PSA media)	Within the operating equipment	32-yd^3 (carbon) 4-yd^3 (PSA media)	Disposal at a licensed special or non-special waste landfill
Glycol	Processing Building (main floor, southern portion); Heat exchanger tanks (2)	600-gallons	Disposed at a licensed liquid waste disposal facility
Virgin Gear Oil and Hydraulic Oil	Processing Building (main floor, southern portion)	600-gallons	Transport to oil recycler
Used Gear Oil and Hydraulic Oil	Processing Building (main floor, southern portion)	300-gallons	Transport to oil recycler

AST – aboveground storage tank
ST – sub-grade storage tank

5.C) The methods to decontaminate any remaining facilities or equipment.

Under the Non-Routine/Temporary Closure Scenario, the following is anticipated regarding decontamination of any remaining facilities or equipment. Because all of the wastes brought to the facility will be non-hazardous liquids and solids, most of the decontamination of the facility and equipment could be accomplished through a simple wash down with water. The wash down water would be suitable for discharge to the MWRD under the existing discharge authorization. It is assumed that a third-party emergency response contractor would be engaged to perform the decontamination and decommissioning. Additional steps and schedule regarding decontamination and decommissioning are provided in Appendix A. The assumptions include:

- The dewatering of the digestate (see Appendix B) is estimated to require 18-days (one person per shift, three shifts/day).
- After the digester is empty, it is estimated that a 4-person, third-party, decommissioning crew, will require approximately 5-weeks (40-hrs/week) to complete the tank cleaning and facility decommissioning. The costs (presented later in Section 3.2) are estimated using a labor rate of $90/hr and a bulk averaged equipment rental rate of $125/hr.
- The other tasks (see Appendix A), including decommissioning of the Gas Handling Equipment, the Feedstock Processing system, the Process Heating system, the Dewatering Equipment, and the Operations Building, are expected to require another crew of four (4) a total of sixteen (16) 8-hr days.
- The work will be overseen by a Professional Engineer familiar with the Closure Plan.

5.D) A schedule and recordkeeping procedures to be followed.

As detailed in a Gantt Chart provided in Appendix A and prepared by Green Arrow Engineering, it is presumed that closure and decontamination can be completed in approximately 5.5-weeks, or less. The schedule in Appendix A actually includes 2-weeks of time to process the liquid in the feedstock equalization tank, which, under the Non-Routine Closure Scenario, would simply be disposed off-site, thereby shortening the Closure time frame a bit. Recordkeeping will be limited to simple waste tracking (e.g., bill of lading) and any recordkeeping/reporting requirements associated with the discharge authorization with the sanitary district. Additional recordkeeping may include any requirements specified in permits obtained from the Illinois EPA and/or City of Chicago. The Closure Activities will be documented in a Closure Report prepared and Certified by a Professional Engineer.

5.E) A plan to be followed in case of premature final closure and temporary shutdown of the unit(s). The plan should identify the specific differences between routine and premature closure.

The steps and assumptions outlined above provide the plan to follow under premature final closure and temporary shutdown. Routine Closure was discussed in Section 2.1.

3.0 CLOSURE COSTS

Per the instructions listed in form LPC-PA11, "*Pursuant to 35 IAC 807.621(d), the closure cost must be based on the assumption that the Agency will contract with a third party for implementation of the closure plan and post-closure plan,*" the costs have been estimated based upon an assumption that the Illinois EPA will contract with a third party to implement the closure plan.

15.A) The cost to remove all waste and decontaminate the facility.
15.B) The cost to treat, or dispose of, or complete composting of the waste, at an offsite facility.
15.C) The cost to certify completion of closure activities utilizing Agency closure certification forms.
15.D) Total cost of the above.

3.1 ROUTINE CLOSURE COSTS

The plan and steps under this scenario were discussed in Section 2.1. The costs to implement the plan are summarized below.

3.1.1 Removal and Treatment/Disposal Costs (Routine Closure)

The removal costs are summarized below, and are based on the following unit costs:

- Non-Food Solid Waste (activated carbon and PSA system media) Removal Costs = \$42/yd^3 (\$30/ton)
- Non-Food Solid Waste Transportation Costs = \$600/load, 20-tons/load, 1.4-tons/yd^3 (\$42/yd^3)
- Non-Food Solid Waste Disposal Costs = \$40/ton (\$56/yd^3)
- Combined Non-Food Solid Waste Removal/Transportation /Disposal = \$140/yd^3

- Costs to remove and dispose or recycle the glycol or petroleum oils are based on vendor quotes.
- Other assumptions are listed in the summary spreadsheets provided in Attachment B.

The table below summarizes the estimated removal/transportation/disposal costs under the Routine Closure Scenario.

Routine Closure Scenario Removal/Transportation Disposal Cost Summary

Waste Type	Waste Amount/Volume	Plan for Removal	Cost
"Raw" food waste - solid	None	Not Applicable	$0.00
"Raw" food waste - solid	None	Not Applicable	$0.00
"Raw" pumpable food waste & wash down water - liquid	None	Not Applicable	$0.00
Mixed waste - Homogenized liquid slurry	None	Not Applicable	$0.00
Partially "treated" waste (Feedstock) - liquid	None	Not Applicable	$0.00
Partially "treated" waste (Conditioned Feedstock) - liquid	None	Not Applicable	$0.00
Wastewater (Digestate)	None	Not Applicable	$0.00
Wastewater (Filtrate)	None	Not Applicable	$0.00
Unused polymer	None	Will be used to assist in digestate dewatering	$0.00
Finished product (compost "cakes") and wood chips/coconut husks	None	Not Applicable	$0.00
Non-Food Solid Wastes (activated carbon, PSA media)	36-yd^3 (carbon + media)	Disposed at a licensed non-special waste landfill	$5,040 ($140/yd^3)
Glycol	600-gallons	Disposed at a licensed liquid waste disposal facility	$1,500 (Hazchem Quote)
Virgin/Used Gear Oil Virgin/Used Hydraulic Oil	900-gallons	Transport to oil recycler	$1,000 (Hazchem Quote)
Total Estimated Removal/Transportation/Disposal Costs (Routine Closure)			**$7,540**

3.1.2 Decontamination Costs (Routine Closure)

The decontamination approach under Routine Closure was presented in Section 2.1. The associated costs are estimated below.

- The decommissioning steps under Routine Closure are comprised of Tasks 2-7 in Appendix A.

- It is estimated that a 4-person, third-party, decommissioning crew, will require approximately 5-weeks (40-hrs/week) to complete the tank cleaning task. The costs are estimated using a labor rate of $90/hr and a bulk averaged equipment rental rate of $125/hr.
- The other tasks (Tasks 3-7 in Appendix A), including decommissioning of the Gas Handling Equipment, the Feedstock Processing system, the Process Heating system, the Dewatering Equipment, and the Operations Building, are expected to require another crew of four (4) a total of 18-days, at $90/hr.
- Equipment rental is estimated at $125/hour for the 200-hrs ($25,000)
- Utility costs are estimated at $15,000 for the 5-weeks of decommissioning.
- The MWRD Surcharges for discharge of wash water ($7,400) were calculated based on the following:
    - 60,000-gallons of digester wash at 20,000-mg/L BOD and 20,000-mg/L TSS
    - 30,000-gallons of equalization tank wash at 30,000-mg/L BOD and 30,000-mg/L TSS
    - 50,000-gallons of processing building wash at 15,000-mg/L BOD and 15,000-mg/L TSS
- Engineering oversight is estimated at $17,500 (bulk average of $175/hr, 20-hrs/week in the field, for 5-weeks), plus another $2,500 in senior Project Manager Oversight).

The table below summarizes the estimated decontamination costs under the Premature Closure Scenario.

Routine Closure Scenario Decontamination Cost Summary

Task/Item	Units	Unit Rate	Estimated Cost
Decontamination Labor (third party)	4-person crew, 40-hrs/week, 5-weeks	$90/hr	$72,000
Decontamination Equipment Rental	200-hrs	$125/hr	$25,000
Other Decommissioning Labor	4-person crew, 8-hrs/day, 18-days	$90/hr	$51,840
Utility Costs	Various	Various	$15,000
MWRD Surcharges	140,000-gallons	Various (see Appendix B)	$7,400
Engineering Oversight	Various	Various	$20,000
Total Estimated Decontamination Costs (Routine Closure)			**$191,240**

3.1.3 Closure Certification Costs (Routine Closure)

Closure Certification and documentation costs (Closure Reporting) are estimated at $10,000.

3.1.4 Total Closure Cost (Routine Closure)

The total estimated Closure Costs under the Routine Closure Scenario are summarized in the table below:

Total Estimated Closure Costs for Routine Closure

Item	Estimated Cost
Removal/Transportation/Disposal Costs	$7,540
Decontamination Costs	$191,240
P.E. Certification and Reporting	$10,000
Total Estimated Closure Costs (Premature Closure)	**$208,780**

3.2 PREMATURE CLOSURE/TEMPORARY SHUTDOWN COSTS

3.2.1 Removal and Treatment/Disposal Costs (Premature Closure)

The costs to remove all wastes and properly dispose off-site under the Premature Closure/Temporary Shutdown scenario are summarized below. The assumed unit costs and other assumptions are as follows:

- All Solid Waste assumed to have density of 1.4-tons/yd^3
- Non-Food Solid Waste (activated carbon and PSA system media) Removal Costs = $42/$yd^3$ ($30/ton)
- Non-Food Solid Waste Transportation Costs = $600/load, 20-tons/load, 1.4-tons/yd^3 ($42/$yd^3$)
- Non-Food Solid Waste Disposal Costs = $40/ton (= $56/$yd^3$)
- Combined Non-Food Solid Waste Removal/Transportation /Disposal = $140/$yd^3$
- Solid Food Waste Removal/Transportation Costs = $20/ton ($28/yd^3)
- Solid Food Waste Disposal Cost = $40/ton ($56/yd^3)
- Combined Solid Food Waste Removal/Transportation/Disposal Costs = $60/ton ($84/yd^3)
- Finished Product (compost) removal/transportation costs = $60/ton ($84/yd^3)
- Liquid Food Waste Removal/Transportation/Discharge to MWRD (as high strength organic material) = $0.13/gallon ($400/load, 5,000-gallons/load ($0.08/gallon) plus roughly $0.05/gallon for HSOM tip fee + other fees)
- Third-party digestate dewatering costs based on an assumed 18-days to complete, with a 1-person crew working 8-hrs/shift, 3-shifts/day, @$90/hr (total of $38,800), plus $9,000 in equipment rental and $26,688 in polymer costs for dewatering
- Discharge Surcharges to MWRD are based on standard user charge rates (2023), of $282.47/million gallons, $184.33/thousand pounds of BOD, and $124.16/thousand pounds

of Total Suspended Solids, an assumed volume of Filtrate volume of 1,680,000-gallons, an assumed BOD concentration of 3,750-mg/L, and an assumed TSS concentration of 2,000-mg/L

- Costs to remove and dispose or recycle the glycol or petroleum oils are based on vendor quotes
- Other assumptions are listed in the summary spreadsheets provided in Appendix B

The table below summarizes the estimated Premature Closure removal/transportation/disposal costs

Premature Closure Scenario Removal/Transportation Disposal Cost Summary

Waste Type	Waste Amount/Volume	Plan for Removal	Estimated Cost
"Raw" food waste – (solid)	100-yd^3	Disposed at another compost facility ($84/yd3)	$8,400
"Raw" pumpable food waste & wash down water – liquid	20,000-gallons (total)	Delivered to a POTW ($0.13/gallon)	$2,600
Mixed waste - Homogenized liquid slurry	5,500-gallons	Delivered to a POTW ($0.13/gallon)	$715
Partially "treated" waste (Feedstock) – liquid	320,000-gallons (feedstock EQ tanks)	Delivered to a POTW ($0.13/gallon)	$41,600
Partially "treated" waste (Conditioned Feedstock) – liquid	1,680,000-gallons (digester)	Dewatered on-site by 3rd party contractor, filtrate discharged to MWRD, dewatered digestate donated/used as compost.	$88,232 (see calculations in Appendix B, totals to $0.0525/gallon)
Wastewater (Digestate)	30,000-gallons (concrete storage tank)	Same as above	$1,576
Wastewater (Filtrate) in-building ASTs	60,000-gallons	Discharged to MWRD under existing authorization	$488 at expected BOD/TSS
Unused Polymer	None (will be used to assist dewatering of digestate)	Will be used, no need for disposal	$0.00
Finished product (compost "cakes") and wood chips/coir	1,426-tons (@20% moisture) (see Appendix B)	Transported to off-site facility for use as compost ($15/ton for transportation but no tip fee)	$21,390
Non-Food Solid Wastes (activated carbon, PSA media)	36-yd^3 (carbon + media)	Disposed at a licensed non-special waste landfill	$5,040
Glycol	600-gallons	Disposed at a licensed liquid waste disposal facility	$1,500 (Hazchem Quote)
Virgin/Used Gear Oil and Virgin/Used Hydraulic Oil	900-gallons (total)	Transport to oil recycler	$1,000 (Hazchem Quote)
Total Estimated Removal/Transportation/Disposal Costs (Premature Closure)			**$172,541**

3.2.2 Decontamination Costs (Premature Closure)

The decontamination approach under Premature Closure Scenario was presented in Section 2.2.

The decontamination costs were estimated as follows:

- After the digester is empty, it is estimated that a 4-person, third-party, decommissioning crew, will require approximately 5-weeks (40-hrs/week) to complete the tank cleaning and facility decommissioning. The costs are estimated using a labor rate of $90/hr and a bulk averaged equipment rental rate of $125/hr.
- The other tasks (Tasks 3-7 in Appendix A), including decommissioning of the Gas Handling Equipment, the Feedstock Processing system, the Process Heating system, the Dewatering Equipment, and the Operations Building, are expected to require another crew of four (4) a total of 18-days, at $90/hr.
- Equipment rental is estimated at $125/hour for the 200-hrs ($25,000)
- Utility costs are estimated at $15,000 for the 5-weeks of decommissioning.
- The MWRD Surcharges for discharge of wash water ($7,400) were calculated based on the following:
    - 60,000-gallons of digester wash at 20,000-mg/L BOD and 20,000-mg/L TSS
    - 30,000-gallons of equalization tank wash at 30,000-mg/L BOD and 30,000-mg/L TSS
    - 50,000-gallons of processing building wash at 15,000-mg/L BOD and 15,000-mg/L TSS
- Engineering oversight is estimated at $17,500 (bulk average of $175/hr, 20-hrs/week in the field, for 5-weeks), plus another $2,500 in senior Project Manager Oversight).

The table below summarizes the estimated decontamination costs under the Premature Closure Scenario.

Routine Closure Scenario Decontamination Cost Summary

Task/Item	Units	Unit Rate	Estimated Cost
Decontamination Labor	4-person crew, 40-hrs/week, 5-weeks	$90/hr	$72,000
Decontamination Equipment Rental	200-hrs	$125/hr	$25,000
Other Decommissioning Labor	4-person crew, 8-hrs/day, 18-days	$90/hr	$51,840
Utility Costs	Various	Various	$15,000
MWRD Surcharges	140,000-gallons	Various (see Appendix B)	$7,400
Engineering Oversight	Various	Various	$20,000
Total Estimated Decontamination Costs (Routine Closure			**$191,240**

3.2.3 Closure Certification Costs (Premature Closure)

The costs to provide final closure certification in the form of a P.E. Certified Closure Report, is estimated at $25,000.

3.2.4 Total Closure Costs (Premature Closure)

The total estimated Closure Costs for the Premature Closure Scenario are summarized in the Table below.

Total Estimated Closure Costs for Premature Closure

Item	Estimated Cost
Removal/Transportation/Disposal Costs	$172,541
Decontamination Costs	$191,240
P.E. Certification and Reporting	$25,000
Total Estimated Closure Costs (Premature Closure)	**$388,781**

APPENDIX A
CLOSURE SCHEDULE

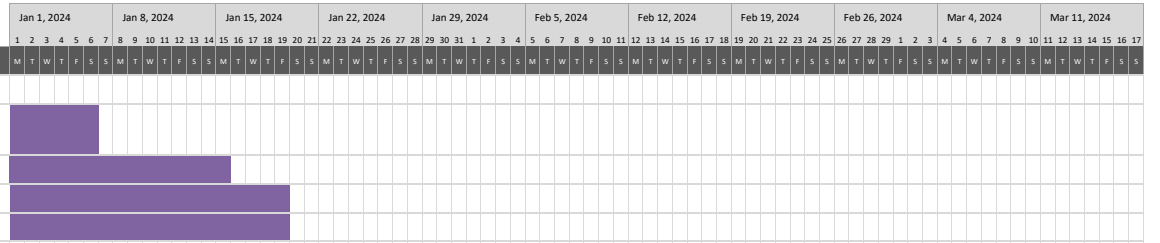
Decommissioning Gantt

Green Era
Lead: Plant Engineer

Project Start: Mon, 1/1/2024
Display Week: 1

TASK	Description	START	END	DURATION	
1 - Finish Processing Organics into Stable Digestate	Green Era Operations Staff			Days	Weeks
Remove any packaged feedstock that wasn't processed	Send material to other digester with depackaging, 20 tons/truck	1/1/24	1/6/24	5.00	0.71
Dose remaining feedstock to digester	325,000 GAL @ 25,000 GPD	1/1/24	1/15/24	14.00	2.00
Dewater Digestate	2 MGAL @ 112,000 GPD (avg 4% TS) includes full digester vol. plus volume fed	1/1/24	1/19/24	18.00	2.57
Haul press cake to composter	93 TPD (avg 20% TS)	1/1/24	1/19/24	18.00	2.57
2 - Tank Cleaning	Outside Contractor				
Clean-out lower level liquid receiving tanks. T-050A/B	Pressure wash and remove any settled solids with a vac truck.	1/6/24	1/12/24	6.00	0.86
Open feedstock tank and clean out any remaining organics. T-100	Remove two tank panels for skid steer access. Remove solids to dump truck. Presssure wash walls and vac truck any liquids.	1/15/24	1/29/24	14.00	2.00
Open digester tank and clean out any remaining organics. T-105	Remove two tank panels for skid steer access. Remove solids to dump truck. Presssure wash	1/19/24	2/2/24	14.00	2.00
Clean-out overflow tank, T-120	Vac. Truck out any solids and pressure wash interior walls.	1/19/24	1/23/24	4.00	0.57
Condensate trap, T-300	Vac. Truck any remaining condensate and pressure wash walls	2/2/24	2/5/24	3.00	0.43
Screened digestate tank, T-205	Vac. Truck any remaining liquids and pressure wash walls	1/26/24	1/30/24	4.00	0.57
Filtrate Tanks, T-250A/B	Vac. Truck any remaining filtrate and pressure wash walls	1/30/24	2/4/24	5.00	0.71
3 - Gas Handling Equipment					
De-energize system	lock-out MCC by opening supply breaker. Remove compressed air supply	1/19/24	1/20/24	1.00	0.14
Purge all process lines	Open vents and valves to flush out pipes.	1/20/24	1/24/24	4.00	0.57
Drain hydraulic oil from compressors	Pump to approved drums or totes and have a recycler pick-up.	1/24/24	1/25/24	1.00	0.14
Remove PSA media	Vacuum from vessels and send to landfill	1/25/24	1/28/24	3.00	0.43
Purge all process lines	Open vents and valves to flush out pipes. Use N2 as purge gas until below LEL.	1/20/24	1/24/24	4.00	0.57
4 - Feedstock Processing					
Flush pipes with fresh water	pump filtrate water through pipes and then drain. Pump to digester.	1/15/24	1/16/24	1.00	0.14
De-energize system	Lock-out MCCs	1/19/24	1/20/24	1.00	0.14
Feedstock hopper and grit tank	pressure wash bins, drain to sump	1/21/24	1/26/24	5.00	0.71
5 - Process Heating					
Flush sludge pipes with fresh water	pump filtrate water through sludge pipes and then drain to screened digestate tank.	1/16/24	1/17/24	1.00	0.14
Drain ethylene glycol	pump to totes and dispose at licensed facility	1/23/24	1/24/24	1.00	0.14
De-energize system	Lock-out MCCs. Shut and lock natural gas supply valves to boilers.	1/24/24	1/25/24	1.00	0.14
6 - Dewatering Equipment					
Flush pipes with fresh water	Feed pipe and tanks diluted with filtrate and then processed through dewatering.	1/20/24	1/22/24	2.00	0.29
Use remaining made-down polymer	cosume remaining made-down polymer	1/22/24	1/22/24	0.00	0.00
Pressure wash all equipment	Clean dewatering equipment and wash down to filtrate tanks for MWRD.	1/23/24	1/24/24	1.00	0.14
De-energize system	Lock-out MCCs	1/24/24	1/25/24	1.00	0.14
7 - Operations Building					
Clean all surfaces	Washdown floors to sumps	1/26/24	1/31/24	5.00	0.71
Remove power from all sumps	Lockout process sump pumps that pump to liquids tank	1/31/24	2/1/24	1.00	0.14
Vac any remaining fluids	Vac liquids from all process sumps	2/1/24	2/2/24	1.00	0.14
Lock-out process air handlers	De-energize makeup air units and odorous air blowers	2/2/24	2/5/24	3.00	0.43
Remove activated carbon bed	Vacuum activated carbon from odor scrubber and landfill (contracted service)	2/2/24	2/7/24	5.00	0.71

Insert new rows ABOVE this one



APPENDIX B
COST ESTIMATION CALCULATIONS

Green Era Digester-Closure and Decommisioning-Estimate of MWRD Surcharges on Filtrate and Wash Water

	Source	Estimated Volume (gallons)	Assumed BOD Conc. (mg/L)	Assumed TSS Conc. (mg/L)	BOD (lbs)	TSS (lbs)	Volume Surcharge ($)	BOD Surcharge ($)	TSS Surcharge ($)	Total MWRD Surcharge Costs	Labor, Polymer, Equipment Costs	Total Cost
Notes	Filtrate	1,680,000	3,750	2,000	52,574.08	28,039.51	$491.35	$9,690.98	$3,481.39	$13,663.72	$74,568.00	**$88,231.72**
										Total for Filtrate		
1	Digester Wash	60,000	20,000	20,000	10,014.11	10,014.11	$17.55	$1,845.90	$1,243.35	$3,106.80	$0.00	$3,106.80
2	Eq Tank Wash	30,000	30,000	30,000	7,510.58	7,510.58	$8.77	$1,384.43	$932.51	$2,325.71	$0.00	$2,325.71
3	Building Wash	50,000	15,000	15,000	6,258.82	6,258.82	$14.62	$1,153.69	$777.09	$1,945.41	$0.00	$1,945.41
										$7,377.92		
										Total for Wash Water		**$7,377.92**
	Volume Rate =		$ 292.47	per million gallons								
	BOD Rate =		$ 184.33	per thousand pounds								
	TSS Rate =		$ 124.16	per thousand pounds								

Footnotes

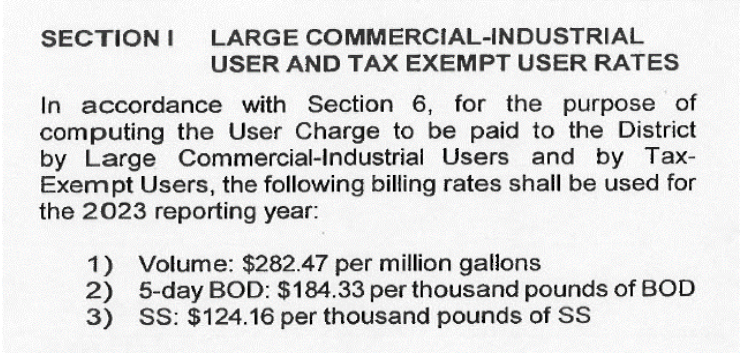
0 Volume of Digester only for "Filtrate", as volume in equalization tank to be disposed off-site under worst case scenario

1 Assume about 2' of tank volume. Any sludge with higher TS will be vacuumed, screened, and dewatered.

2 Any volume with higher TS will be fed to the digester. The EQ tank will be cleaned prior to the digester.

3 Allowing for washdown of below slab tanks.

BELOW ARE THE RATES EFFECTIVE 1/1/2023



SECTION I LARGE COMMERCIAL-INDUSTRIAL USER AND TAX EXEMPT USER RATES

In accordance with Section 6, for the purpose of computing the User Charge to be paid to the District by Large Commercial-Industrial Users and by Tax-Exempt Users, the following billing rates shall be used for the 2023 reporting year:

1) Volume: $282.47 per million gallons
2) 5-day BOD: $184.33 per thousand pounds of BOD
3) SS: $124.16 per thousand pounds of SS

Green Era Digester-Closure and Decommissioning
Labor and Equipment Costs for Dewatering of Digestate

	Summary of Costs to Dewater 2,000,000-gallons	
Labor	$38,880.00	
Equipment	$9,000.00	
Consumables	$26,688.00	
Total	$ 74,568.00	(or $0.0373/gallon, not including MWRD Surcharges)

	3 shift, 24/7 operation	
Working days	333	running hours
weeks	13.875	minimum days
	18	expected days, with startup and shutdown
men	3	one man per shift
hours/day	8	
billable rate	90	$/h
labor per day	$ 2,160.00	
total labor	$ 38,880.00	

Assumed 2m belt press for 1 ton bone dry cake per hour.

Basis was 8 hours of operating time, plus 2 hours for start-up/shutdown.

Equipment	$ 3,000.00	$/week
	$ 9,000.00	total equipment fee

Equipment cost of $3000/wk based on online advertised pricing of $12,500/month.

polymer cost (basis)	2,000,000	gallons
% total solids	4.0%	%
lbs of solids	667,200	dry lbs of sludge
bone dry tons	333.60	dry tons
polymer per dry ton	20	lbs/dry ton
lbs of neat polymer	6,672	lbs
polymer	$4.00	$/lb neat (100% active)
total cost	$26,688	

Decommissioning and Closure-Green Era Digester; 650 W. 83rd Street, Chicago, IL

Estimate of Cake Production by Processing of Digester Contents plus 30,000-gallons in-building storage, at Closure

Volume of digestate to dewater

1,710,000	gallons	x	8.34	lbs/gal	x	4.0%	TS [sludge]	=	570,456 lbs of solids (dry)
570,456	lbs	/	20%	TS [cake]	/	2000	lbs/ton	=	1,426 tons of cake

Transportation and Tipping Fees

Urban Growers is assumed to accept 100% of the cake for composting at no tip fee.

$150	$/hour trucking	x	2 hours assumed round trip time		/	20	tons/load	=	$15 transport cost $/ton

1,426	tons[cake]	x	($15 transport cost per ton		+	0 tip fee	)	=	$ 21,392.10
1,426	tons[cake]	x	($0 dispose per ton		+	0 Assume given for use	)	=	$ -

Total Costs to Remove and Transport to Off-Site = **$ 21,392.10**