December 21, 2009 093-89168

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials, Region 9
270 Michigan Ave.
Buffalo, New York 14203

Attention: Mr. Stanley Radon, Sr. Engineering Geologist

RE: SNPE - VANDEMARK CHEMICAL DNAPL ASSESSMENT & SUPPLEMENTAL WORK PLAN VANDEMARK CHEMICAL FACILITY, LOCKPORT, NY

Dear Mr. Radon:

On behalf of SNPE Inc. (SNPE), Golder Associates Inc. (Golder) has prepared this report to address the issues and concerns raised by the New York State Department of Environmental Conservation concerning further characterization and development of a supplemental Work Plan pertaining to investigation activities of tar impacts along the Eighteen Mile Creek bank and slope adjacent to the VanDeMark Chemical facility in Lockport, New York. SNPE, Inc. as former site owner is taking the lead in conducting the additional evaluation described herein and conducting any recommended supplemental characterization activities with support from the current site owner, VanDeMark Chemical, Inc.

1.0 BACKGROUND

In October 2006, SNPE, as site Owner at that time, conducted sampling of the on-site groundwater monitoring wells network as part of due diligence efforts associated with the pending sale of the facility. The sampling effort identified the presence of a significant amount of dense non-aqueous phase liquid (DNAPL) in the deeper bedrock monitoring well (MW 2D) located approximately 25 feet north of the top of the creek bank in a paved area just west of the training and men's locker room building (Figure 1).

Based on this finding, further visual investigation of the adjacent slope and Eighteen-Mile Creek bank area south and presumably downgradient of this well was performed by SNPE's consultant. These inspections revealed visible quantities of an accumulated coal-tar like substance seeping out near the base (toe) of the cliff face and present along an approximately 100 feet length of the creek bank shoreline itself.

Upon this discovery and in consultation with the New York State Department of Environmental Conservation (NYSDEC), two separate remedial efforts were undertaken through SNPE in 2007 and 2008 (Benchmark, Sept. 12, 2007, Dec. 22, 2008, and May 20, 2009) to mitigate and remove the accumulated tar material that appeared to have flowed out from the toe of the slope and accumulated along the top of bedrock and intermingled within the bank sediments and into the creek itself. These removal efforts were predicated on the concept that the flow of accumulated tar had run its course based on the highly weathered appearance of the accumulations. Therefore, the remedial efforts were aimed toward expeditious removal of these source materials that were exposed on the creek bank and within the creek and follow-up monitoring the creek bank after removal to confirm that new seeps were not occurring.

In the summer of 2009 however, a joint inspection conducted by the NYSDEC and Pam Cook from VanDeMark Chemical revealed the presence of newly accumulated tar residuals at both the toe of the slope and on top of the clean backfill that was placed along the creek bank area previously remediated. This finding has led to a request by the NYSDEC to perform a more detailed evaluation of the potential

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source, nature and extent of the tar residuals along and within the bedrock along the escarpment (creek bank) area. Specifically the NYSDEC has requested the preparation of a Work Plan to characterize and better define the impacts in order to craft a more comprehensive remedial approach going forward.

During an October 14, 2009 review meeting with representatives from NYSDEC, SNPE, VanDeMark and Golder, the complexity (i.e. fractured nature) of the underlying rock geology at the VanDeMark Facility and the assumption that the release of the tar residuals most likely occurred more than 40 years ago was reiterated. Therefore, it was agreed that attempting to further delineate the source and extent of the existing DNAPL within the overburden soils and underlying bedrock through a traditional boring investigation program would be costly and unlikely to better characterize the location of extent of the impacts. This type of investigation would also be logistically difficult to implement due to the layout and constrained access within the facility and the hazards of performing these activities in conjunction with the ongoing chemical production activities. The NYSDEC, SNPE and VanDeMark concurred that a more beneficial strategy would consist of a phased assessment of the problem.

Following this strategy, Golder conducted the following tasks:

- A historical record review;
- Bedrock and DNAPL analysis and conceptual model formulation; and
- Summarization of findings and preparation of Workplan

2.0 HISTORICAL SITE REVIEW

A review of historical records was conducted from the sources discussed below:

2.1 Sanborn Map Review

A review of the available historical Sanborn fire insurance maps of the site and surrounding parcels for evidence of past manufacturing or related commercial activities that may have resulted in the generation and disposal of tar residuals was conducted by Golder.

Sanborn maps were obtained through Environmental Data Resources (EDR) using the current Site's One North Transit Road address. Maps were available from the years 1898, 1903, 1909, 1914, 1919, 1928, 1948 and 1969. In general the maps illustrate an area encompassing the present VanDeMark Chemical operations and surrounding parcels north to Mill Street and south to Eighteen Mile Creek. The maps confirm that the Site and adjacent parcels have a long history of nearly uninterrupted industrial use. The following detailed observations and inferences were made:

- From the late 1800's through the 1920s, the Site was occupied by a company alternately known as "United Industrial Fibre Co., United Indurated Fibre Co., and Fibre Corporation". The maps identified these companies as being manufacturers of fibre pipe, pails, drums, etc. The most notable features on the map that were associated with all these operations were a "Bake Oven Building", a combined "Resin Storage and Boiling House" building and in the 1914 and 1919 maps a new building located in the southeast portion of the Site. A portion of this building is labeled "Impregnating Room". On the 1919 map, three tanks (presumably outdoors) are evident on the north side of what's now called the "Impregnating House". One of the tanks is labeled as a "Pitch Tank & Heater". These operations and nomenclature would be consistent with the practice of treating/impregnating the fiber-based pipes, containers, etc. with a bituminous mastic or pitch material to waterproof or render them suitable for storing or conveying other liquids.
- The 1928 Sanborn Map indicates that the Fibre Corporation appears to be defunct and most buildings are labeled as vacant. Tenants that may be leasing portions of the former Fibre Corp buildings are listed as Norton Laboratories and National Lead Co. There are no further descriptions of their activities or the nature of their operations.

- The 1948 Sanborn map reveals a significantly diminished set of physical buildings and structures on the Site and it is listed as “Niagara Chlorine Products Corporation”. Buildings are labeled as “Factory Building”, Aluminum Chloride”, “Empty Drum Storage” and “Weld Shop”. There are no indications of processes or structures that might be associated with the generation of tar related substances.
- The 1969 Sanborn Map contains the first reference to the “VanDeMark Chemical Co.” on the Site and the buildings and labeling of them remains essentially unchanged from the 1948 map. The Milward Alloys buildings appear on this map in the northeast corner of the Site and are labeled generically as “Factory Buildings”.

A copy of the Sanborn Maps reviewed and described above are included in Attachment A.

2.2 Aerial Photographs Review

A review of the available historical aerial photographs of the site and surrounding parcels for evidence of past manufacturing or related commercial activities that may have resulted in the generation and disposal of tar residuals was also performed by Golder.

Aerial photographs were obtained through EDR using the current Site’s One North Transit Road address. The aerial photos available for review were from the years 1962, 1972, 1985, 1995 and 2006. Based on the known site history, these photos encompass the more recent ownership of the Site by either the VanDeMark/VanChem group of companies (in the 1960s, 1970s, 1980s and majority of the 1990s) or the subsequent ownership of the Site by SNPE NA (SNPE) from the late 1990s through 2006. In general, the photos obtained were taken at an elevation and resulting scale that does not allow for detailed evaluation of specific structures or features and in many cases the photo resolution/quality is relatively poor which further limits the usefulness of the photos.

The photos scale and resolution only allow for confirmation of the presence of the chemical manufacturing plant on the Site during the time frame encompassed by the photos. No other observations or conclusion could be drawn from the photos.

A copy of the aerial photos reviewed and described above are included in Attachment B.

2.3 Facility Records Review

A review of VanDeMark Chemical facility records/files was conducted with the assistance of VandeMark personnel to determine if documentation exists pertaining to the production of CO or any other related process activities (e.g., coal combustion related operations) that may have been associated with the source of the tar residuals observed in the bedrock well and migrating from the toe of the slope.

The records review performed by Golder revealed that oldest available known files are dated to the early 1960s. Specifically, engineering design and documentation information pertaining to the installation of the carbon monoxide (CO) storage tank installation were found and dated circa 1962. This confirmed the assumed time frame for the implementation of CO purchase off-site that was initiated when the on-site generation of CO for use as a raw material in the manufacture of phosgene was discontinued.

Production records related to pre-1962 processes were unavailable and according to current VanDeMark employees there is no record that these records exist.

2.4 Employee Interviews

VanDeMark Chemical provided names of four former employees (all retired) that worked at the facility and were employed in the 1950s and 1960s and may have had direct or anecdotal knowledge of the processes employed by VanDeMark and VanChem (a system company to VanDeMark co-located at the Site) related to the potential use or generation of coal-tar based substances or residuals.

Golder attempted to conduct telephone interviews with all of the former employees and was successful in contacting two of the four contacts provided. Mr. Gerald Schultz indicated that he did not begin working at the VanDeMark facility until the late 1960s and had no knowledge of any processes employed during his tenure that used or resulted in the generation of coal tar or related substances. He also added that he recalled no discussions with longer tenured employees at that time who indicated that any generation or disposal of coal tar related residuals occurred at the facility.

Mr. Robert Dunn, a former long time production worker and supervisor for the VanDeMark Chemical Company was also interviewed. He was employed at the facility during the majority of the 1950s. He had direct knowledge of the on-site CO manufacturing process and was definitive that CO was generated using coke (not coal) as the primary carbon raw material source. To his knowledge, coal was not purchased for use at the facility for any purpose. Mr. Dunn described the residuals from the CO "producers" as a dry ash–like material. He was unaware of any coal-tar based substances either being used as a raw material in any of the production process or generated as a by-product or waste. He described the routine disposal over the south slope of silicon carbide solid waste that was generated from the silicon tetra- carbide process. This fill material was observed in quantity at or near the surface during recent inspections of the creek bank and adjacent slope area.

2.5 Previous Report Review

A review of the results of the Phase II Investigation report performed at the facility in 1998/1999 at the request of SNPE prior to transfer of ownership to SNPE was performed by Golder. As part of this Phase II investigation, seven soil borings were advanced and sampled and six ground water monitoring wells were installed, developed and sampled. The results of these investigation activities were utilized extensively in support of the "DNAPL Transport Analysis" presented in Section 3 of this report.

2.6 Historical Record Review Summary

The results of the historical records review and interviews described above were intended to determine if a more definitive connection may be made as to the type, location, time frame, quantity and disposal practices associated with coal tar residuals from the historical manufacturing activities at the facility. This approach was followed to address the NYSDEC's specific concerns related to conducting a more thorough assessment of the Dense Non Aqueous Phase Liquid (DNAPL) source (potential coal tar) and to better define the extent of the impacts within the complex bedrock geology of the site.

In general, the results of the records review and interviews conducted, while not definitive, found that the Site currently occupied by the VanDeMark Chemical Company and adjacent properties have a long and diverse history of heavy industrialized usage dating back to the late 1800s. A review of the processes and operations conducted at the site over the past 65 to 70 years, i.e., since the Site was under control of the VanDeMark Chemical Company and it successors, did not find evidence that the chemical processes employed resulted in the generation or disposal of coal-tar related residuals during this time period. Prior to conducting the employee interviews there was some anecdotal reports by current VanDeMark employees that coal may have been used/combusted to generate CO prior to the discontinuation of on-site CO generation on the early 1960s. As noted in the interview summary, this does not appear to be consistent with the actual process employed and the use of coke was a standard method of CO generation that would have been typical for a phosgene production facility during the early to mid 1900s.

The most relevant information obtained from the records review pertains to evidence from the Sanborn maps of the use of "pitch" and the identification of a pitch storage tank adjacent to an "Impregnating House" on the 1919 map. The approximate location of these structures was scaled based on the location of North Transit Road and railroad spurs and when overlaid on the current site map is consistent with the area of the Site to the north - northeast of MW-2D that may potentially be the source of the DNAPL as discussed in more fully in Section 3.

3.0 DNAPL TRANSPORT ANALYSIS

To characterize the geologic aspects of the overall tar impacts at the site associated with the ongoing migration of the DNAPL through the bedrock and into the creek bank area adjacent to the toe of the escarpment slope, Golder reviewed existing geologic, hydrogeologic, and groundwater/DNAPL chemistry information and summarized it to create a conceptual site model of DNAPL transport at the facility. These reviews and a summary are presented in the sections following.

3.1 Site Geology Review

Geologic information was primarily derived from the 1999 Phase I/II report by Dames & Moore (Dames & Moore, 1999) and the 2006 field investigation summary report by Benchmark Environmental Engineering & Science PLLC (Benchmark, Nov 30, 2006). In general, the site is underlain by 10-14 feet of brown to black silty sand and gravel fill, subsequently underlain by a silt and clay till (with some coarse sand and medium gravel). Total overburden thickness ranges from approximately 10-20 feet.

Bedrock under the site was described in the Dames & Moore report referenced above as soft red-brown shale or red to gray sandstone, dipping gently to the south at 30-40 feet per mile (i.e. sub-horizontal). Bedrock descriptions were refined in the Benchmark report referenced above, which was associated with the installation of well MW-7D. In this borehole the uppermost bedrock underlying the site was identified as the Grimsby Sandstone, described in MW-7D as a dark red brown to grey, moderately strong, fine-grained, thinly bedded, slightly to moderately weathered intensely fractured sandstone. Also noted were occasional clay-filled horizontal fractures. Other factures were extremely to vary narrow and partially healed, some iron-stained.

The unit underlying the Grimsby Sandstone is the Power Glen Shale, described in MW-7D as a dark gray with light to medium gray banded, horizontally bedded, very hard, shale. Also noted were clay filled horizontal fractures. These units are both part of the Lower Silurian age Medina Group. Both units are shown in cross sections of the site, shown in Figure 2.

The highly fractured nature of the bedrock is well exhibited in the upper portions of an outcrop along W. Jackson Street approximately ¼ mile west of the site (just SE of the Lockport sewer treatment plant), where both the Grimsby/Power Glen formations as well as the underlying Upper Ordovician aged rock are visible. Common fracture patterns in this area would consist of intersecting near-vertical fractures (often forming a characteristic “diamond” shape when viewed from above) and near horizontal fractures typically corresponding with bedding planes. These “diamond” patterns of intersecting near-vertical fractures are easily visible just beyond the south facility gate leading to the closed section of Gooding Street, and are located just to the north of the road where the bedrock surface is exposed.

Topographically, the facility sits on the north side of Eighteen Mile Creek, which flows generally west at this location. The facility itself sits on gently sloping land, with the north side between approx. 5 and 10 feet higher than the south side (based on monitoring well survey data), thus surface water flow is toward the creek. Immediately south of the facility is the steep valley of Eighteen Mile Creek, which has a relief of approx. 50+ feet (based on the USGS 1:24,000 quadrangle map).

3.2 Hydrogeology Review

Groundwater elevation measurements collected during the 1999 Dames & Moore Phase I/II investigation indicate groundwater flow in the overburden and bedrock is to the southwest towards Eighteen Mile Creek. Bedrock gradients are steep, as groundwater elevations near the north side of the site (e.g. in MW-4D) are approx. 30 feet higher than those near the valley edge (e.g. in MW-3D and MW-2D), from which Golder calculated a gradient of approx. 0.2. Groundwater elevations measured in 2006 (Benchmark, Nov. 30, 2006) appear similar.

Note there were some irregularities in Table 2 of the 1999 Dames & Moore Phase I/II report (the values for "Depth to Groundwater From TOC" for wells MW-2S and MW-2D appear to have been inadvertently switched), however the calculated groundwater elevations appear to be correct. As no tests to calculate bedrock hydraulic conductivity are known to have been performed, no estimate of groundwater flow rate has been made.

3.3 Chemistry Review

3.3.1 Previous Sample Results

Soil and groundwater were sampled at the facility in 1999 (Dames & Moore, 1999), and groundwater, surface water, and NAPL were sampled in 2006 and 2007 (Benchmark; Nov. 30, 2006; Dec. 22, 2006; and Feb 26, 2007). As summarized in the Dames & Moore report, exceedances of state standards in soils were noted for Volatile Organic Compounds (VOCs), Base/Neutral/Acid (BNAs – aka Semi-Volatile Organic Compounds [SVOCs]), and metals. Metal exceedances were rather evenly distributed across the site, with VOC exceedances limited to the MW-6 and MW-3 locations, and BNA exceedances found in the MW-5 and MW-6 boreholes. Some metal exceedances (e.g. arsenic, iron, manganese, magnesium) are expected in areas with glacially derived soils such as found at the site, and may not necessarily be related to site activities.

For groundwater samples collected in 1999, all wells indicated exceedances of VOCs except for MW-2S, and all wells had metal exceedances similar to those in the soil samples. BNA exceedances, likely associated with tar DNAPL and present at much higher concentrations (up to 110,000 ppb for naphthalene) than any of the other compounds were limited to MW-2D, with minimal impact elsewhere. A strong moth ball-like odor, and NAPL were observed in MW-2D during sampling.

One suite of chlorinated compounds was limited to the western portion of the site in wells MW-3D and MW-4D, suggesting a possible upgradient off-site source for these compounds. A second suite of chlorinated compounds, with none of the same compounds as the first, was found only in well MW-1D, suggesting a different source. Compounds typically associated with gasoline impacted groundwater (e.g. toluene, ethylbenzene, and xylene) were limited to samples collected from MW-5S and MW-2D in the south/central part of the site.

In 2006, a second round of well sampling was performed (Benchmark, Nov. 30, 2006) including NAPL sampling in MW-2D, two surface water samples collected in Eighteen Mile Creek, and a new well MW-7D installed just west of MW-2D. Monitoring well results were similar to the first round of sampling in that the most significant impacts were present in MW-2D (up to 230,000 ppb for naphthalene), and appear to be related to coal-tar like DNAPL impact (based on the DNAPL analysis). Note wells MW-2S and MW-4D could not be located and were thus not re-sampled, the gasoline-like compounds flagged as exceedances MW-5S in the first round were not detected in the second, and that none of the wells were analyzed for metals in round two.

No VOCs or BNAs were detected in either the upstream or downstream samples collected from Eighteen Mile Creek, suggesting no dissolved-phase measurable impact to the Creek that can be attributed to site activities.

Sample results from MW-7D (Benchmark, Dec. 22, 2006), installed approximately 7 feet west of MW-2D, indicated that groundwater in MW-7D is actually more similar to that collected in cross-gradient wells MW-1D, and MW-3D and only similar to that of MW-2D with regards to VOCs (suggesting a common upgradient VOC source[s]). SVOC (i.e. coal-tar-related) concentrations in MW-7D groundwater were *not* similar to those in MW-2D, and instead were much lower or absent, like those in MW-2D and MW-3D, suggesting that the DNAPL impact area is very localized around MW-2D. No DNAPL was noted in MW-7D.

3.3.2 November 2009 DNAPL Sample Results

A sample of recently exposed (i.e. post-remedial effort) DNAPL was collected from several deposits on November 19, 2009 along the area of the creek bank previously remediated and adjacent toe of the cliff face for chemical property analysis to characterize the DNAPL. The results of the analysis are presented in Attachment C.

The detected constituents, primarily semi-volatile organic compounds (SVOCs) and to a much lesser extent volatile organic compounds (VOCs) are nearly identical to the compounds detected in the DNAPL sample collected from MW-2D in November 2006 and reported in Table 3 of the "Summary of Supplemental Field Investigation and Sampling Activities" dated November 30, 2006 (Benchmark Environmental Engineering). In general, the concentrations reported were an order of magnitude lower than the 2006 DNAPL sample which would be consistent with the weathering and environmental exposure/degradation that would be expected for DNAPL that has slowly migrated through the bedrock fractures and onto the creek bank. The close correlation of the compounds detected within the DNAPL found in the bedrock monitoring well MW2D and the recent sample found along the creek bank confirms that it is highly probable that they emanated from the same source.

3.4 DNAPL Transport and General Site Conceptual Model

The above information was compiled and used to construct a conceptual model of the site's DNAPL transport from the likely original source area location to the toe of the cliff. Based on the Sanborn map notation of "pitch" and the identification of a pitch storage tank adjacent to an "Impregnating House" on the 1919 map (located just south of existing well MW-5S), and the reported use of coke (and not coal) for CO production, Golder has concluded that the most likely origin for the current DNAPL is the pitch impregnation process dating from the late 1910s.

Though the exact mechanism for how the DNAPL was transported from the pitch impregnation process line to the upper bedrock is unknown, the approximate location of the pitch impregnation structures (Figure 1) directly north (upgradient) from MW-2D (the only location where DNAPL is currently present in a well) suggests the tar either leaked directly from the process equipment into the site soils, or it was possibly disposed of in an unlined pit very near the process buildings (a common practice of that era).

Once in the site soils, the tar would move downward through the soil pores under the influence of gravity (it being denser than water) until reaching the upper bedrock, where it would continue its downward migration through the vertical rock fractures known to be present at the site. With the dip of the rock being gently towards the creek (i.e. south), and with groundwater flow also generally towards the south, the downward-migrating DNAPL would also tend to have a southerly component as well (along the bedding planes), until eventually the tar would either exit the rock on north face of the slope of Eighteen Mile Creek (to then flow under the overburden cover of the slope), or it would move downward through the rock until it reaches the (probable) less permeable rock layer currently trapping the tar near the toe of the slope, and *then* move south. At that point it would collect at the toe of the slope as it is currently seen to be doing. The reappearance of the tar subsequent to remedial efforts support the model that tar is continuing to move through the rock (with the rock voids acting as a reservoir) and exiting at the toe of the slope, and was not a one-time "pulse" of DNAPL.

The observation that the DNAPL is currently present in a very limited area at the toe of the slope supports the earlier findings that the original source area was also very localized. The groundwater chemistry findings that show the dissolved phase impact from the DNAPL is similarly localized around well MW-2D also support the above limited-extent source area scenario, and suggests DNAPL was not widely dispersed across the site.

4.0 PROPOSED WORK PLAN / SCHEDULE

In view of the above findings and conceptual model, it would be impractical or impossible remove the source of the DNAPL, which is likely now the rock fractures, or to intercept the DNAPL while it is still

moving through the rock fractures without significantly interrupting site operations. There are also considerable technical/cost challenges to removing very viscous liquids from small pore spaces/fractures, with a certain percentage of tar material likely to remain in place no matter what the extraction technique attempted. Consequently, the most practical strategy to prevent the migration of DNAPL into Eighteen Mile Creek may be to design and construct a DNAPL capture structure at the toe of the slope to intercept the DNAPL before it reaches the creek floodplain (where it is currently noted collecting), but after it exits the rock. This would likely be a linear structure parallel to the creek, substantial enough to withstand occasional creek flooding, with a mechanism for periodic tar removal.

In order to design any such capture structure, the bedrock/overburden interface in the floodplain, at the toe of the slope, and part way up the slope face must be well defined over entire reach of creek where DNAPL is currently collecting.

As a next step in the remedial process, Golder proposes the preparation of a detailed elevation and location survey of the overburden and underlying bedrock surfaces in this area. Based on the previous remedial activities performed in the creek bank floodplain area, the bedrock surface may potentially be reached using hand punchbars, small portable engine-powered augers, or by a small excavator. Once a three-dimensional map has been constructed of the overburden and bedrock surface, the suitability of various designs for the interception and collection of the DNAPL can be assessed.

Due to weather and safety concerns (i.e., difficult access, steep slopes, and proximity to swift-flowing water) associated with implementing the proposed work, Golder recommends scheduling the survey in late spring 2010.

Subsequent to collection and mapping of this data, development of detailed remedial design alternatives based on the DNAPL intercepting structure(s) concept presented above is proposed for Department review within 8 to 10 weeks of survey completion. Assessment of the suitability and effectiveness of each design alternative is anticipated to be a component of the design alternatives submittal with final remedy selection to be determined in conjunction with the NYSDEC.

If you have any questions concerning the findings and recommendations presented in this assessment report or the proposed supplemental Work Plan activities, please contact us at 716-215-0650.

Sincerely,

GOLDER ASSOCIATES INC.

Patrick T. Martin, P.E., BCEE
Senior Consultant

David C. Wehn, CPG
Associate

C: D. Slick, SNPE, Inc.
P. Cook, VanDeMark Chemical

Attachments:
Figures 1 and 2
Attachment A: Sanborn Fire Insurance Maps
Attachment B: Aerial Photographs
Attachment C: DNAPL Analysis Report (TestAmerica, December 2009)

PTM/DCW:dml

5.0 REFERENCES

Benchmark Environmental Engineering & Science, PLLC, November 30, 2006, *ISOCHEM Inc. – Lockport Facility Summary of Supplemental Field Investigation & Sampling Activities*

Benchmark Environmental Engineering & Science, PLLC, December 22, 2006, *ISOCHEM Inc. – Lockport Facility Supplemental Field Investigation & Sampling Report No. 2*

Benchmark Environmental Engineering & Science, PLLC, February 26, 2007, *ISOCHEM Inc. – Lockport Facility Summary of Site Reconnaissance Activities*

Benchmark Environmental Engineering & Science, PLLC, March 23, 2007, *ISOCHEM Inc. – Lockport Facility DNAPL Assessment Report*

Benchmark Environmental Engineering & Science, PLLC, June 4, 2007, *ISOCHEM Inc. – Lockport Facility Proposed Site Monitoring Program and Creek Bank Clean-up Approach*

Benchmark Environmental Engineering & Science, PLLC, July 18, 2007, *ISOCHEM Inc. – Lockport Facility REVISED Site Monitoring Program and Creek Bank Clean-up Approach*

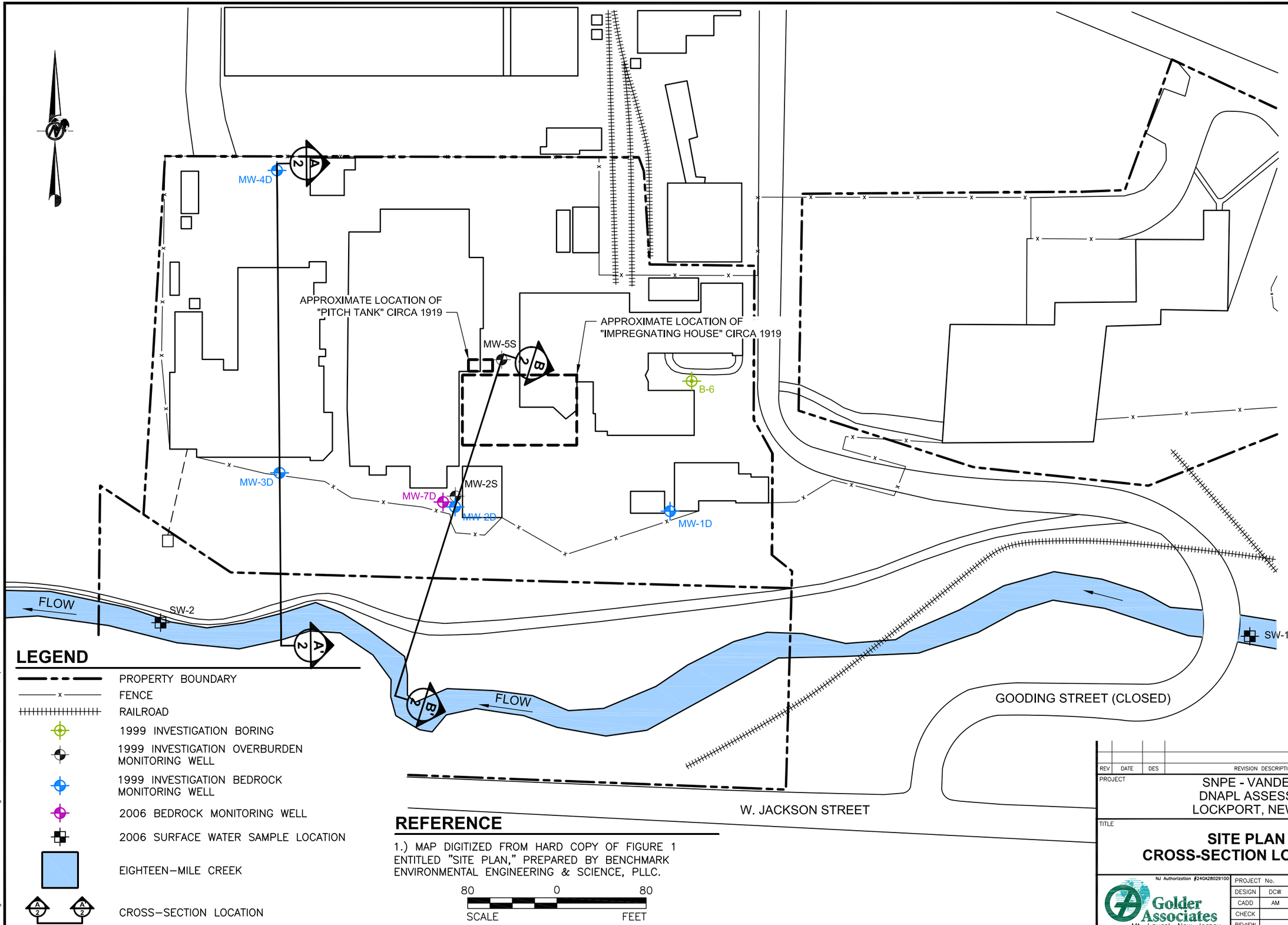
Benchmark Environmental Engineering & Science, PLLC, September 12, 2007, *VanDeMark (ISOCHEM) Inc. – Lockport Facility Creek Bank Clean-up Closeout Report*

Benchmark Environmental Engineering & Science, PLLC, December 22, 2008, *VanDeMark (ISOCHEM) Inc. – Lockport Facility Summary of Work Performed Report*

Benchmark Environmental Engineering & Science, PLLC, May 20, 2009, *VanDeMark (ISOCHEM) Inc. – Lockport Facility Supplement to December 2008 Creek Bank Clean-up Report – Summary of Work Performed*

Dames & Moore, September 17, 1999, *PHASE I/II ENVIRONMENTAL AUDIT, VanDeMark, Inc. & Vanchem, Inc., 1 North Transit Road, Lockport, New York*

FIGURES



LEGEND

- PROPERTY BOUNDARY
- FENCE
- RAILROAD
- 1999 INVESTIGATION BORING
- 1999 INVESTIGATION OVERBURDEN MONITORING WELL
- 1999 INVESTIGATION BEDROCK MONITORING WELL
- 2006 BEDROCK MONITORING WELL
- 2006 SURFACE WATER SAMPLE LOCATION
- EIGHTEEN–MILE CREEK
- CROSS–SECTION LOCATION

REFERENCE

1.) MAP DIGITIZED FROM HARD COPY OF FIGURE 1 ENTITLED "SITE PLAN," PREPARED BY BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC.

80 0 80
SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT
SNPE - VANDEMARK
DNAPL ASSESSMENT
LOCKPORT, NEW YORK

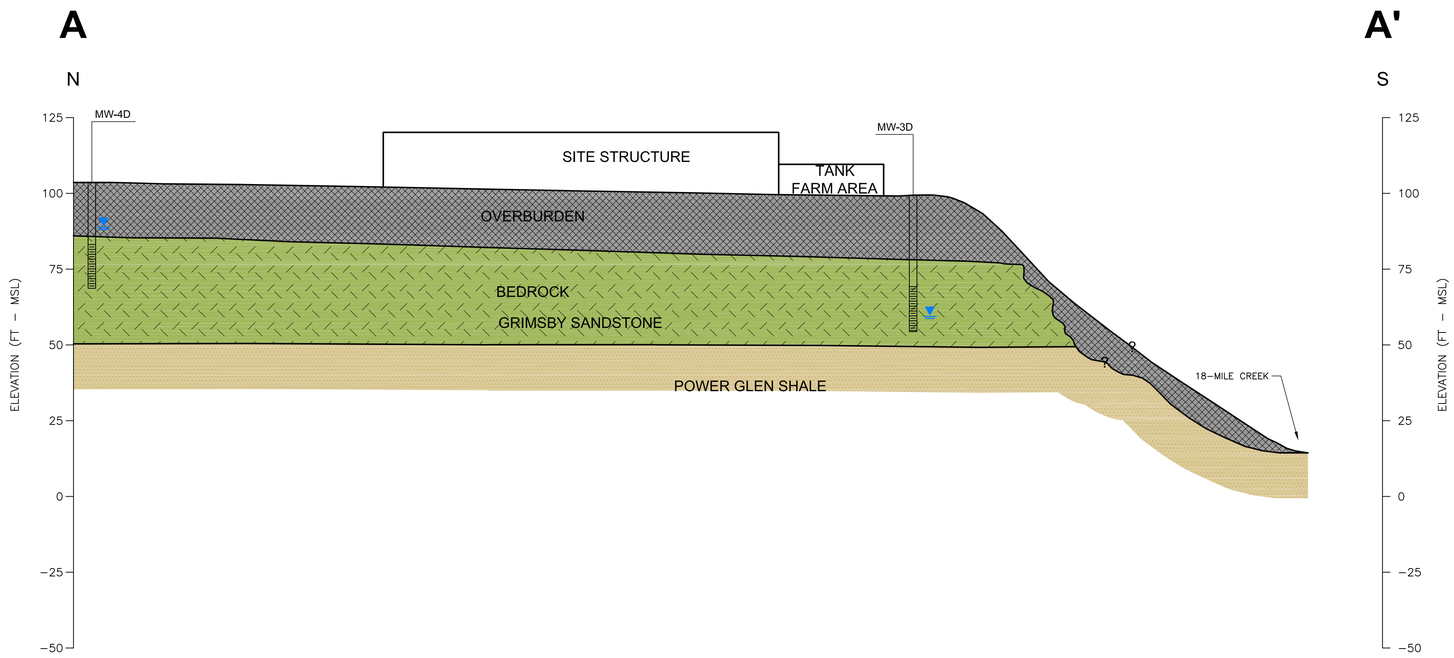
TITLE
SITE PLAN AND CROSS-SECTION LOCATION MAP

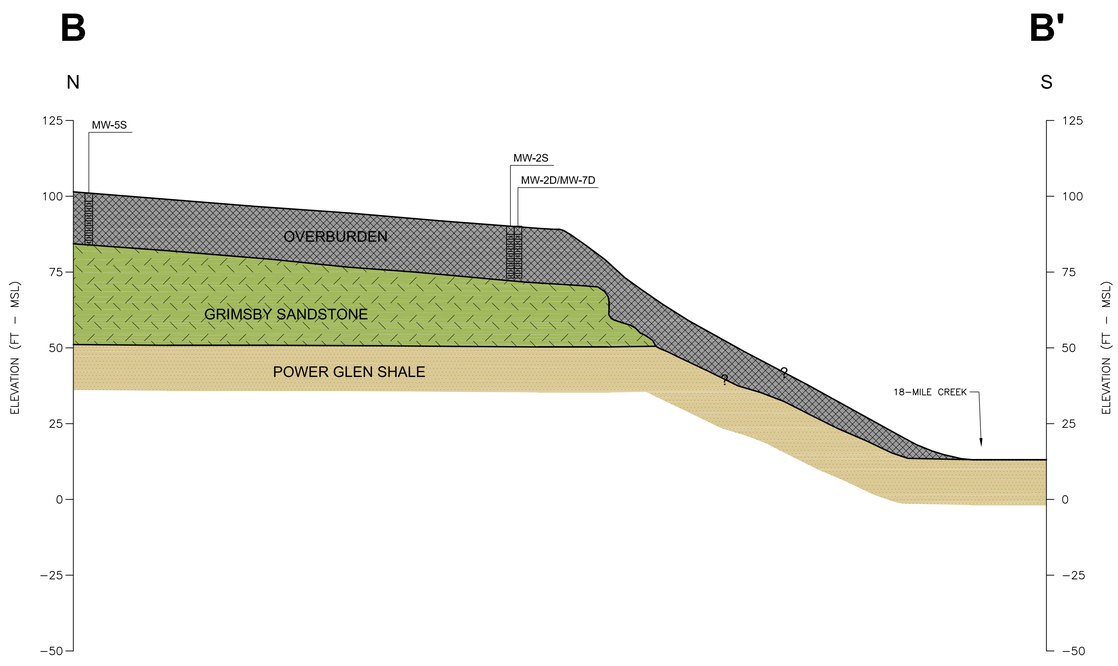
NJ Authorization #24GA28029100
Golder Associates
Mt. Laurel, New Jersey

PROJECT No.	093-89168	FILE No.	09389168A001	
DESIGN	DCW	11/19/09	SCALE AS SHOWN	REV. 0
CADD	AM	12/09/09		
CHECK				
REVIEW				

FIGURE 1

Drawing file: 09389168A001.dwg Dec 14, 2009 - 4:53pm





LEGEND

- OVERBURDEN
- BEDROCK GRIMSBY SANDSTONE
- POWER GLEN SHALE

REFERENCES

1.) URS CORP. FIGURE 3 – PHASE I/II ENVIRONMENTAL AUDIT – VANDE/MARIL, INC. A VANCHEM, INC. SEPTEMBER 17, 1999.

2.) BENCHMARK BES, PLLC – SUMMARY OF SUPPLEMENTAL FIELD INVESTIGATION AND SAMPLING ACTIVITIES, ISOCHEM INC., NOVEMBER 30, 2006.

3.) U.S.G.S. LOCKPORT QUADRANGLE (FOR ELEVATION OF EIGHTEEN-MILE CREEK)

25 0 25 50
HORIZONTAL SCALE FEET

25 0 25 50
VERTICAL SCALE FEET

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW

PROJECT

SNPE - VANDEMARK
DNAPL ASSESSMENT
LOCKPORT, NEW YORK

TITLE

CROSS SECTIONS A-A' AND B-B'

NJ Authorization #24GA28029100
Golder Associates
Mt. Laurel, New Jersey

PROJECT No.	093-89168		FILE No.	09389168A002	
DESIGN	DCW	11/19/09	SCALE	AS SHOWN	REV. 0
CADD	AM	12/09/09			
CHECK					
REVIEW					

FIGURE 2

Drawing File: 09389168A002.dwg Dec 15, 2009 - 3:47pm

ATTACHMENT A

SANBORN FIRE INSURANCE MAPS

One North Transit Road
One North Transit Road
Lockport, NY 14094

Inquiry Number: 2633108.3
November 06, 2009

Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

11/06/09

Site Name:
One North Transit Road
One North Transit Road
Lockport, NY 14094

EDR Inquiry # 2633108.3

Client Name:
Golder Associates, Inc.
2221 Niagara Falls Blvd. Ste 9
Niagara Falls, NY 14304

Contact: Aaron Lange

EDR® Environmental Data Resources Inc

The complete Sanborn Library collection has been searched by EDR, and fire insurance maps covering the target property location provided by Golder Associates, Inc. were identified for the years listed below. 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 Sanborn Library LLC, the copyright holder for the collection.

Certified Sanborn Results:

Site Name: One North Transit Road
Address: One North Transit Road
City, State, Zip: Lockport, NY 14094
Cross Street:
P.O. # NA
Project: NA
Certification # 3D28-45F9-A4D1

Maps Provided:

1969	1903
1948	1898
1928	
1919	
1914	
1909	

Sanborn® Library search results
Certification # 3D28-45F9-A4D1

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✓ Library of Congress
- ✓ University Publications of America
- ✓ EDR Private Collection

Limited Permission To Make Copies

Golder Associates, Inc. (the client) is permitted to make up to THREE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

Certified Sanborn® Map Report Enhancements for 2009

The accompanying Certified Sanborn Map Report reflects a number of enhancements that make it easier for you to review these historical maps. EDR has digitally joined together the more than one million fire insurance maps from the Sanborn Library collection so that your target property is centered, making it easier for you to review adjoining properties. Here is a list of the new features:

· Your target property is centered on each map. You can quickly locate your target property and view adjoining properties. Plus, adjoining properties are included more often, reducing your need to refer to additional maps.

· All maps are now displayed at a uniform scale. This makes it easier for you to view changes to the property over time.

· We've increased coverage by adding thousands of new maps from 40 cities for years 1994-2007.

· A new Map Key and Sheet Thumbnails let you reference sheet numbers, year and volume of original Sanborn Map panels used for this report.

For more information about the new enhancements to the Certified Sanborn Map Report, contact your EDR representative at 800-352-0050.

Sanborn Sheet Thumbnails

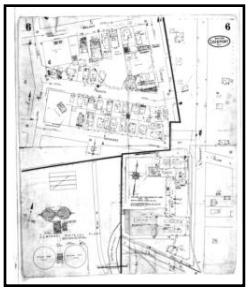
This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.

1969 Source Sheets

Volume 1, Sheet 24

Volume 1, Sheet 25

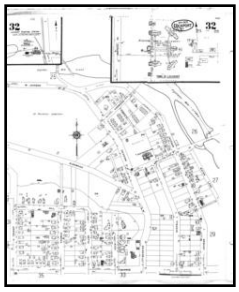
Volume 1, Sheet 32



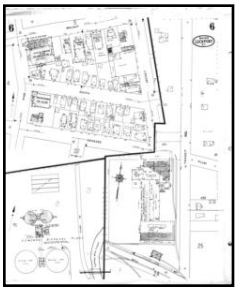
Volume 1, Sheet 6

1948 Source Sheets

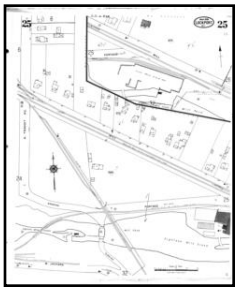
Volume 1, Sheet 24



Volume 1, Sheet 32



Volume 1, Sheet 6

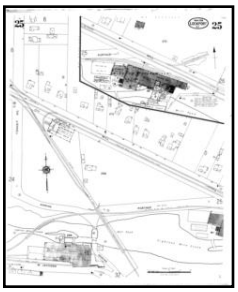


Volume 1, Sheet 25

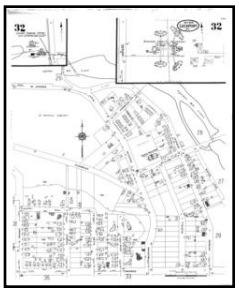
1928 Source Sheets

Volume 1, Sheet 6

Volume 1, Sheet 24



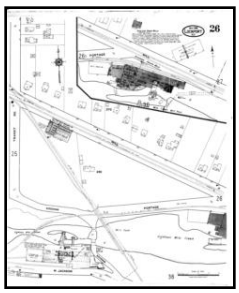
Volume 1, Sheet 25



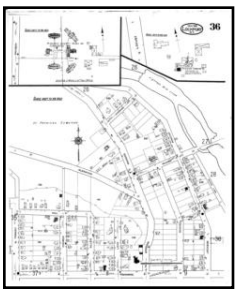
Volume 1, Sheet 32

1919 Source Sheets

Volume 1, Sheet 25

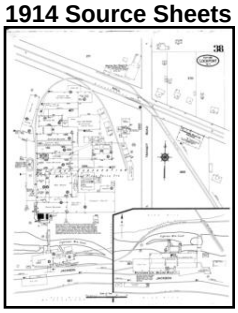


Volume 1, Sheet 26



Volume 1, Sheet 36

1914 Source Sheets

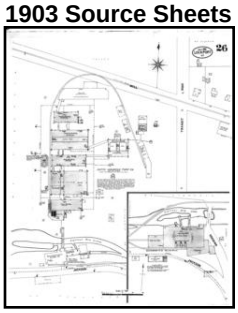


Volume 1, Sheet 38

1909 Source Sheets

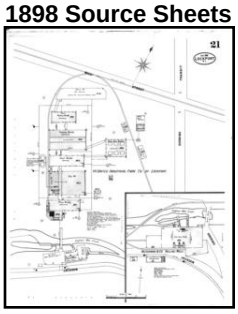
Volume 1, Sheet 38

1903 Source Sheets



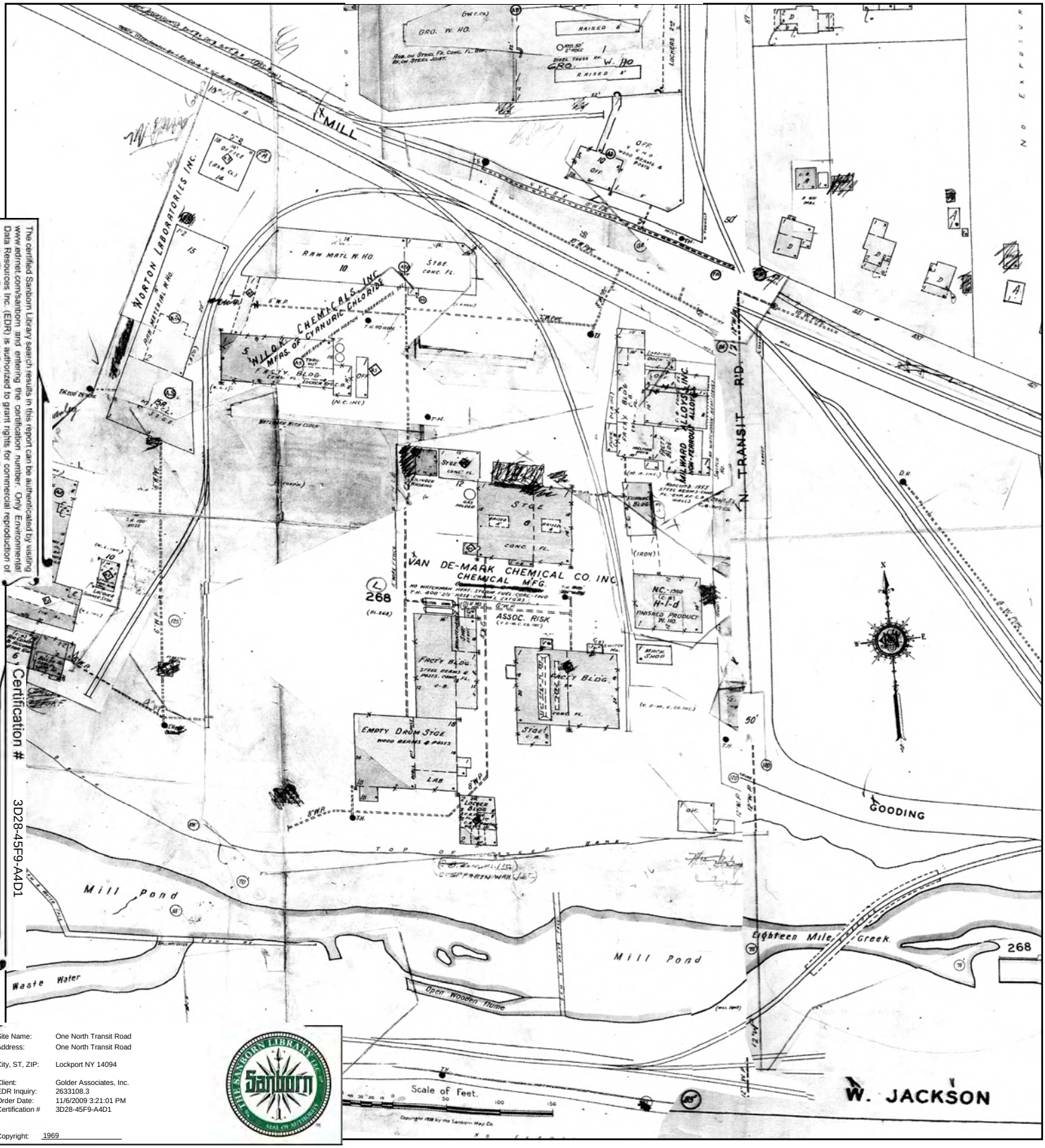
Volume 1, Sheet 26

1898 Source Sheets



Volume 1, Sheet 21

1969 Certified Sanborn Map

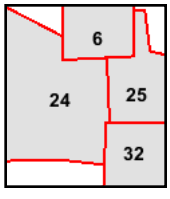


The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by The Sanborn Library LLC, the copyright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

Certification # 3D28-45F9-A4D1

Site Name:	One North Transit Road
Address:	One North Transit Road
City, ST, ZIP:	Lockport NY 14094
Client:	Golder Associates, Inc.
EDR Inquiry:	2633108.3
Order Date:	11/6/2009 3:21:01 PM
Certification #	3D28-45F9-A4D1
Copyright:	1969

This Certified Sanborn Map combines the following sheets (thumbnails on page 3).

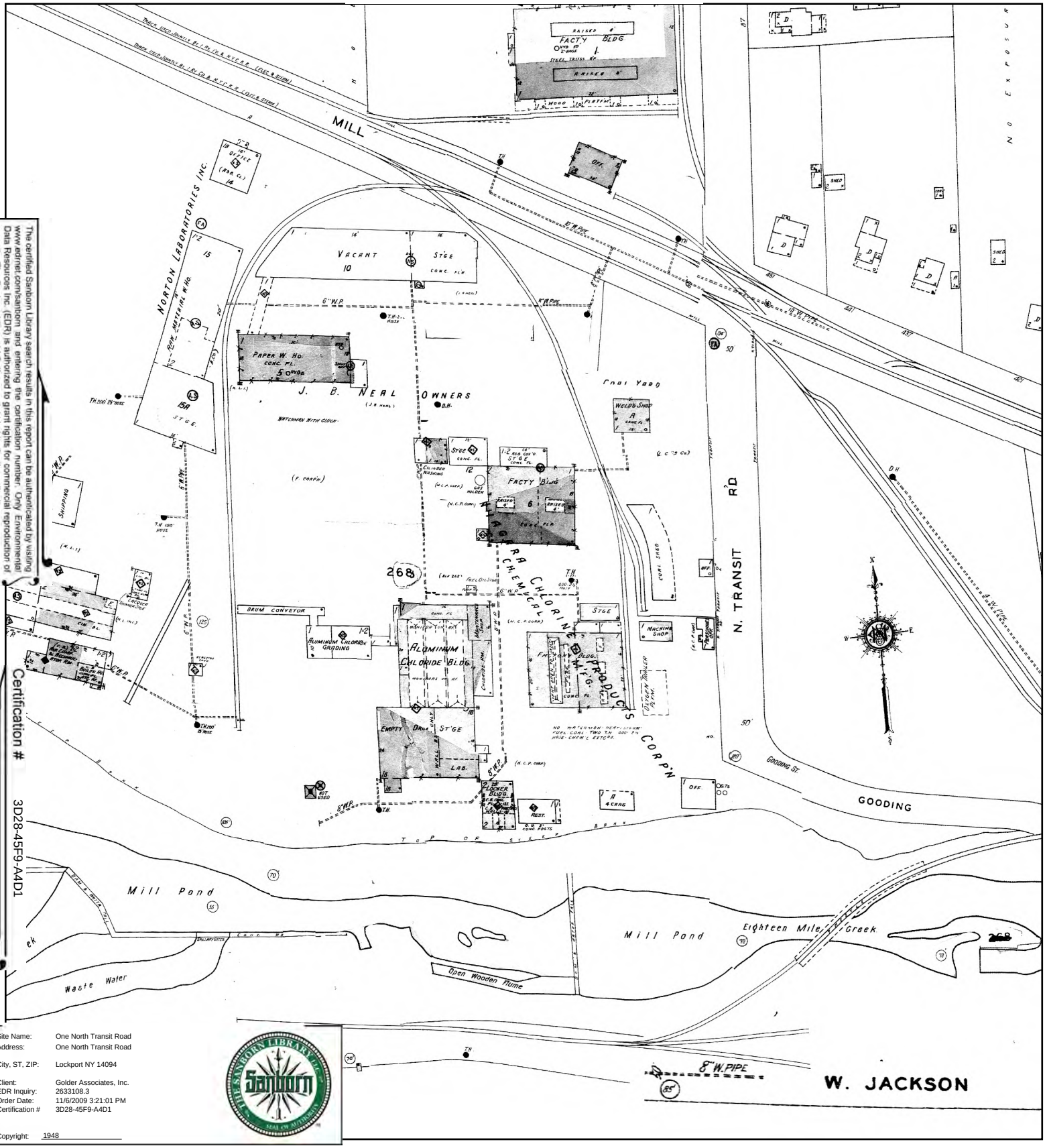


Volume 1, Sheet 24
Volume 1, Sheet 25
Volume 1, Sheet 32
Volume 1, Sheet 6

0 Feet 150 300 600

N

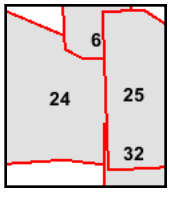
1948 Certified Sanborn Map



Certification # 3D28-45F9-A4D1

Site Name:	One North Transit Road
Address:	One North Transit Road
City, ST, ZIP:	Lockport NY 14094
Client:	Golder Associates, Inc.
EDR Inquiry:	2633108.3
Order Date:	11/6/2009 3:21:01 PM
Certification #	3D28-45F9-A4D1
Copyright:	1948

This Certified Sanborn Map combines the following sheets (thumbnails on page 3).

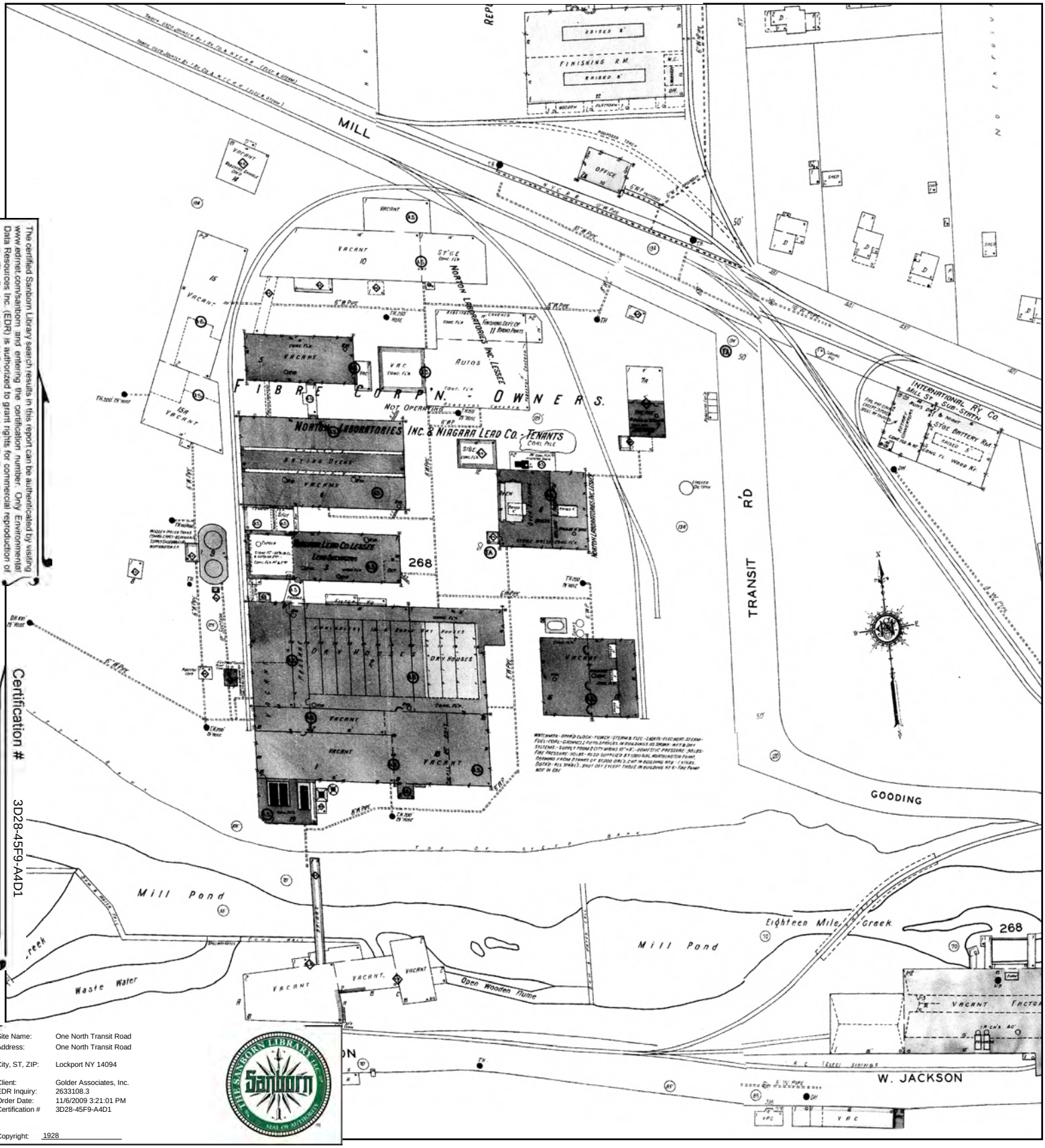


Volume 1, Sheet 24
Volume 1, Sheet 32
Volume 1, Sheet 6
Volume 1, Sheet 25

0 Feet 150 300 600

N

1928 Certified Sanborn Map



Certification # 3D28-45F9-A4D1

Site Name:	One North Transit Road
Address:	One North Transit Road
City, ST, ZIP:	Lockport NY 14094
Client:	Golder Associates, Inc.
EDR Inquiry:	2633108.3
Order Date:	11/6/2009 3:21:01 PM
Certification #	3D28-45F9-A4D1

Copyright: 1928

This Certified Sanborn Map combines the following sheets (thumbnails on page 3).

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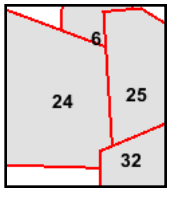
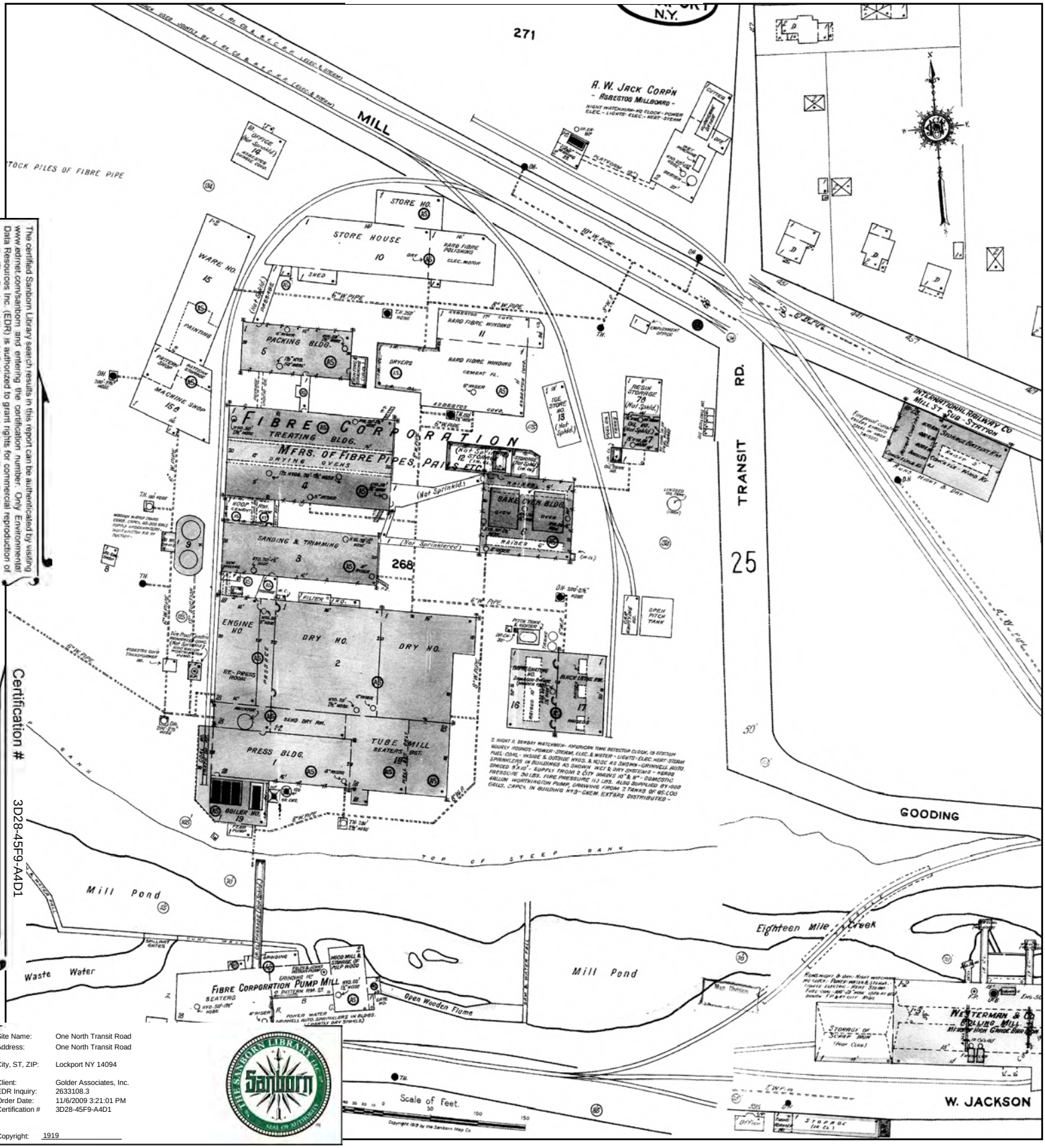


Volume 1, Sheet 6
Volume 1, Sheet 24
Volume 1, Sheet 25
Volume 1, Sheet 32

N

1919 Certified Sanborn Map



Certification # 3D28-45F9-A4D1

Site Name:	One North Transit Road
Address:	One North Transit Road
City, ST, ZIP:	Lockport NY 14094
Client:	Golder Associates, Inc.
EDR Inquiry:	2633108.3
Order Date:	11/6/2009 3:21:01 PM
Certification #	3D28-45F9-A4D1
Copyright:	1919

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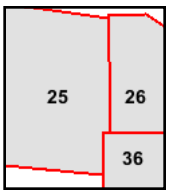
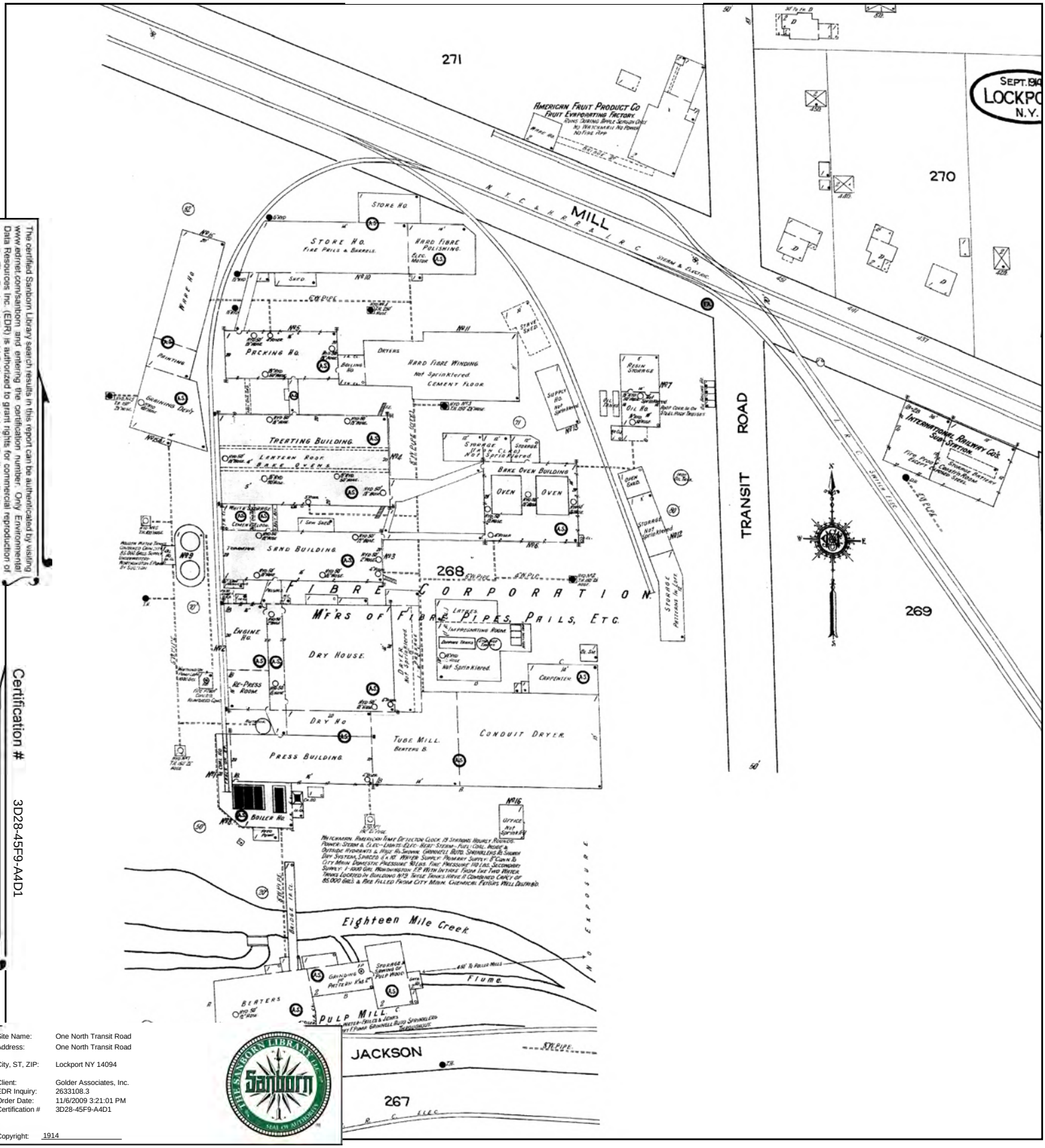


Volume 1, Sheet 25
Volume 1, Sheet 26
Volume 1, Sheet 36

0 Feet 150 300 600

N

1914 Certified Sanborn Map



Certification # 3D28-45F9-A4D1

Site Name: One North Transit Road
Address: One North Transit Road
City, ST, ZIP: Lockport NY 14094

Client: Golder Associates, Inc.
EDR Inquiry: 2633108.3
Order Date: 11/6/2009 3:21:01 PM
Certification # 3D28-45F9-A4D1

Copyright: 1914

This Certified Sanborn Map combines the following sheets (thumbnails on page 3).

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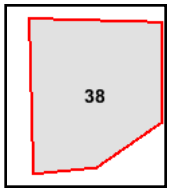
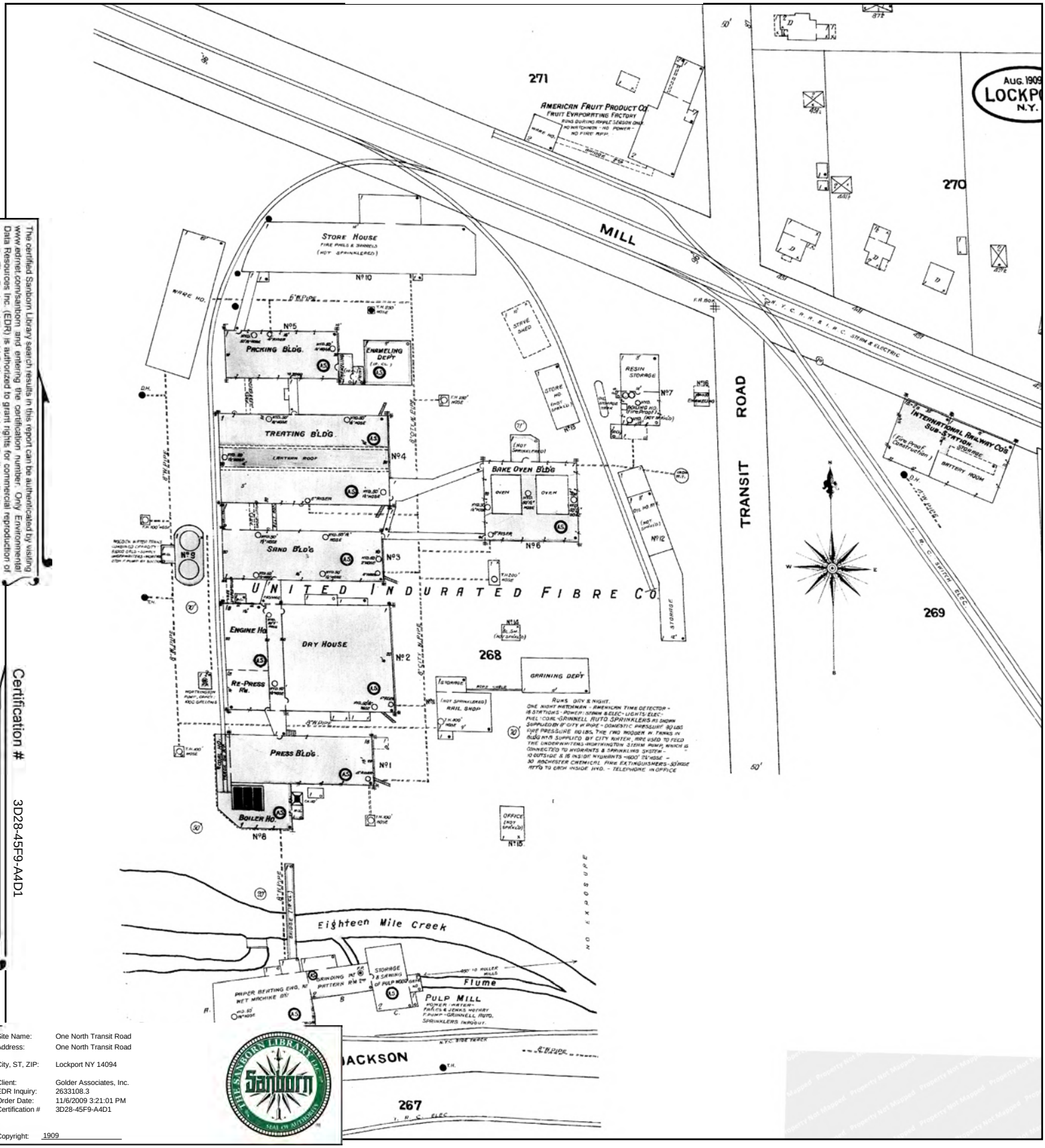


Volume 1, Sheet 38

N

1909 Certified Sanborn Map



Certification # 3D28-45F9-A4D1

Site Name:	One North Transit Road
Address:	One North Transit Road
City, ST, ZIP:	Lockport NY 14094
Client:	Golder Associates, Inc.
EDR Inquiry:	2633108.3
Order Date:	11/6/2009 3:21:01 PM
Certification #	3D28-45F9-A4D1
Copyright:	1909

This Certified Sanborn Map combines the following sheets (thumbnails on page 3).

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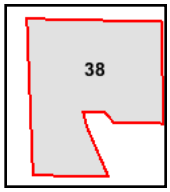
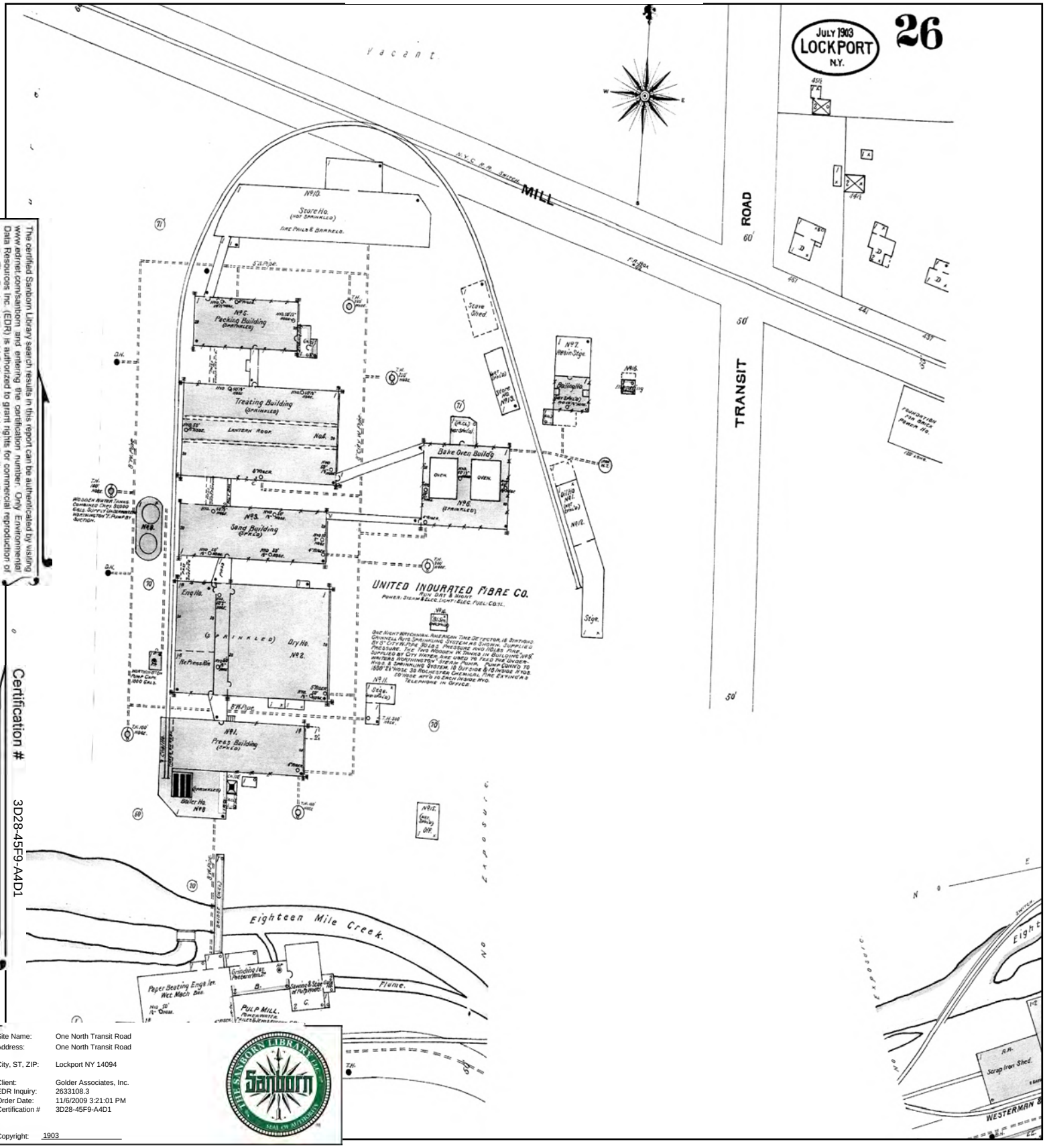


Volume 1, Sheet 38

N

1903 Certified Sanborn Map



Certification # 3D28-45F9-A4D1

Site Name:	One North Transit Road
Address:	One North Transit Road
City, ST, ZIP:	Lockport NY 14094
Client:	Golder Associates, Inc.
EDR Inquiry:	2633108.3
Order Date:	11/6/2009 3:21:01 PM
Certification #	3D28-45F9-A4D1
Copyright:	1903

This Certified Sanborn Map combines the following sheets (thumbnails on page 3).

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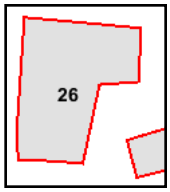
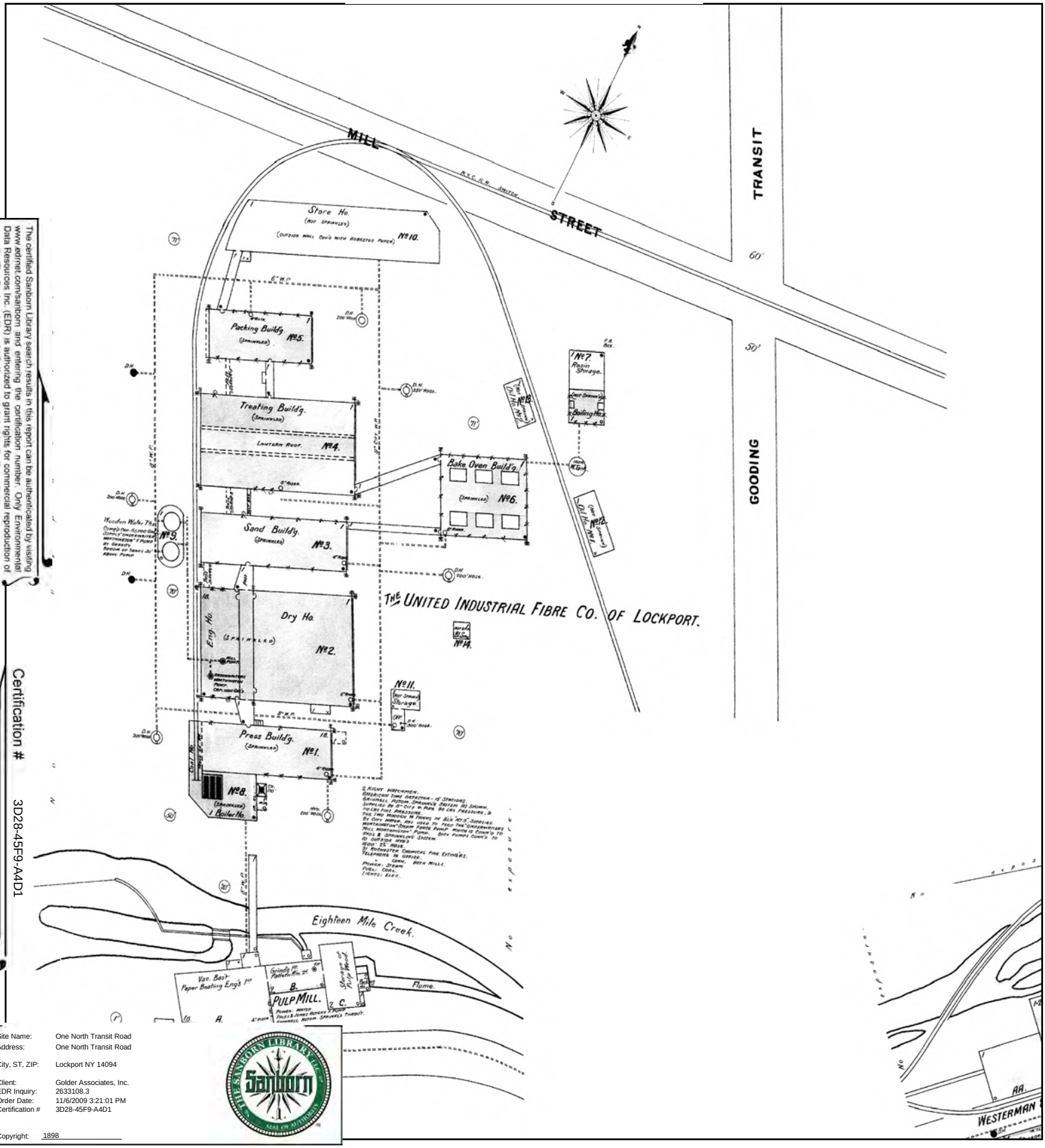


Volume 1, Sheet 26

N

1898 Certified Sanborn Map



Certification # 3D28-45F9-A4D1

Site Name:	One North Transit Road
Address:	One North Transit Road
City, ST, ZIP:	Lockport NY 14094
Client:	Golder Associates, Inc.
EDR Inquiry:	2633108.3
Order Date:	11/6/2009 3:21:01 PM
Certification #	3D28-45F9-A4D1
Copyright:	1898

This Certified Sanborn Map combines the following sheets (thumbnails on page 3).

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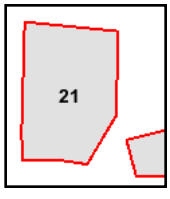

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N

ATTACHMENT B

AERIAL PHOTOGRAPHS

One North Transit Road
One North Transit Road
Lockport, NY 14094

Inquiry Number: 2633108.4
November 10, 2009

The EDR Aerial Photo Decade Package

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDRs professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

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

Date EDR Searched Historical Sources:

Aerial Photography November 10, 2009

Target Property:

One North Transit Road

Lockport, NY 14094

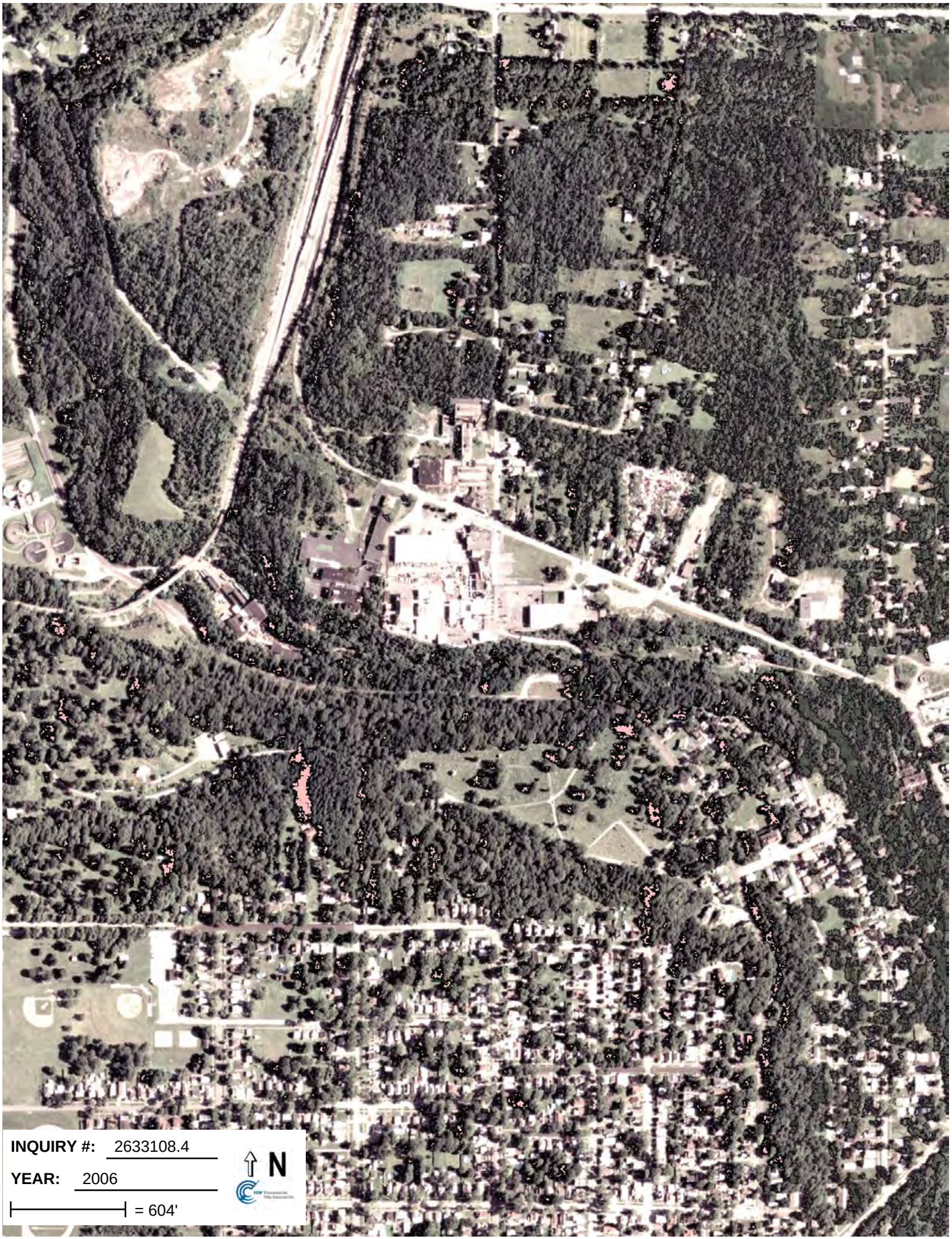
Year	***Scale***	***Details***	***Source***
1962	Aerial Photograph. Scale: 1"=750'	Panel #: 2443078-B6/Flight Date: October 19, 1962	EDR
1972	Aerial Photograph. Scale: 1"=500'	Panel #: 2443078-B6/Flight Date: May 13, 1972	EDR
1985	Aerial Photograph. Scale: 1"=1000'	Panel #: 2443078-B6/Flight Date: May 03, 1985	EDR
1995	Aerial Photograph. Scale: 1"=750'	Panel #: 2443078-B6/Flight Date: March 28, 1995	EDR
2006	Aerial Photograph. 1" = 604'	Flight Year: 2006	EDR


INQUIRY #: 2633108.4
YEAR: 1962
= 750'
N


INQUIRY #: 2633108.4
YEAR: 1972
= 500'
N


INQUIRY #: 2633108.4
YEAR: 1985
= 1000'
N


INQUIRY #: 2633108.4
YEAR: 1995
= 750'
N


INQUIRY #: 2633108.4
YEAR: 2006
= 604'
N

ATTACHMENT C

DNAPL ANALYSIS REPORT (TESTAMERICA, DECEMBER 2009)

Analytical Report

Work Order: RSK0944

Project Description

Golder - Vandermark/Isochem site

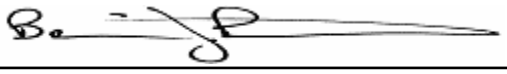
For:

Pat Martin

Golder Associates, Inc. - Niagara Falls, NY

2221 Niagara Falls Blvd., Ste 9

Niagara Falls, NY 14304



Brian Fischer

Project Manager

Brian.Fischer@testamericainc.com

Thursday, December 10, 2009

Golder Associates, Inc. - Niagara Falls, NY
2221 Niagara Falls Blvd., Ste 9
Niagara Falls, NY 14304

Work Order: RSK0944

Project: Golder - Vandermark/Isochem site
Project Number: [none]

Received: 11/19/09
Reported: 12/10/09 09:29

TestAmerica Buffalo
Current Certifications

As of 1/27/2009

STATE	Program	Cert # / Lab ID
Arkansas	CWA, RCRA, SOIL	88-0686
California*	NELAP CWA, RCRA	01169CA
Connecticut	SDWA, CWA, RCRA, SOIL	PH-0568
Florida*	NELAP CWA, RCRA	E87672
Georgia*	SDWA,NELAP CWA, RCRA	956
Illinois*	NELAP SDWA, CWA, RCRA	200003
Iowa	SW/CS	374
Kansas*	NELAP SDWA, CWA, RCRA	E-10187
Kentucky	SDWA	90029
Kentucky UST	UST	30
Louisiana*	NELAP CWA, RCRA	2031
Maine	SDWA, CWA	NY0044
Maryland	SDWA	294
Massachusetts	SDWA, CWA	M-NY044
Michigan	SDWA	9937
Minnesota	SDWA,CWA, RCRA	036-999-337
New Hampshire*	NELAP SDWA, CWA	233701
New Jersey*	NELAP,SDWA, CWA, RCRA,	NY455
New York*	NELAP, AIR, SDWA, CWA, RCRA,CLP	10026
Oklahoma	CWA, RCRA	9421
Pennsylvania*	NELAP CWA,RCRA	68-00281
Tennessee	SDWA	02970
Texas*	NELAP CWA, RCRA	T104704412-08-TX
USDA	FOREIGN SOIL PERMIT	S-41579
USDOE	Department of Energy	DOECAP-STB
Virginia	SDWA	278
Washington*	NELAP CWA,RCRA	C1677
Wisconsin	CWA, RCRA	998310390
West Virginia	CWA,RCRA	252

*As required under the indicated accreditation, the test results in this report meet all NELAP requirements for parameters for which accre ditation is required or available. Any exceptions to NELAP requirements are noted in this report.

Golder Associates, Inc. - Niagara Falls, NY
2221 Niagara Falls Blvd., Ste 9
Niagara Falls, NY 14304

Work Order: RSK0944

Project: Golder - Vandermark/Isochem site
Project Number: [none]

Received: 11/19/09
Reported: 12/10/09 09:29

CASE NARRATIVE

According to 40CFR Part 136.3, pH, Chlorine Residual, Dissolved Oxygen, Sulfite, and Temperature analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. field-pH), they were not analyzed immediately, but as soon as possible after laboratory receipt.

A pertinent document is appended to this report, 1 page, is included and is an integral part of this report.

TestAmerica Laboratories, Inc. certifies that the analytical results contained herein apply only to the samples tested as received by our Laboratory.

Golder Associates, Inc. - Niagara Falls, NY
2221 Niagara Falls Blvd., Ste 9
Niagara Falls, NY 14304

Work Order: RSK0944

Project: Golder - Vandermark/Isochem site
Project Number: [none]

Received: 11/19/09
Reported: 12/10/09 09:29

DATA QUALIFIERS AND DEFINITIONS

D04	Dilution required due to high levels of non-target compounds
D12	Dilution required due to sample viscosity
H8	The sample was extracted past the holding time.
J	Analyte detected at a level less than the Reporting Limit (RL) and greater than or equal to the Method Detection Limit (MDL). Concentrations within this range are estimated.
L	Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was above the acceptance limits. Analyte not detected, data not impacted.
L1	Laboratory Control Sample and/or Laboratory Control Sample Duplicate recovery was above acceptance limits.
R2	The RPD exceeded the acceptance limit.
W1	Sample was prepared and analyzed utilizing the medium level extraction.
Z3	The sample required a dilution due to the nature of the sample matrix. Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.
NR	Any inclusion of NR indicates that the project specific requirements do not require reporting estimated values below the laboratory reporting limit.

ADDITIONAL COMMENTS

Results are reported on a wet weight basis unless otherwise noted.

Golder Associates, Inc. - Niagara Falls, NY
2221 Niagara Falls Blvd., Ste 9
Niagara Falls, NY 14304

Work Order: RSK0944

Project: Golder - Vandermark/Isochem site
Project Number: [none]

Received: 11/19/09
Reported: 12/10/09 09:29

Executive Summary - Detections

Analyte	Sample Result	Data Qualifiers	RL	MDL	Units	Dil Fac	Date Analyzed	Lab Tech	Batch	Method
Sample ID: RSK0944-01 (VANDEMARK DNAPL - Waste)						**Sampled: 11/18/09 14:30**		**Recvd: 11/19/09 17:45**		
Volatile Organic Compounds by EPA 8260B										
Ethylbenzene	**460**	W1, D04,J	560	38	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Xylenes, total	**370**	W1, D04,J	1100	94	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Semivolatile Organics by GC/MS										
2-Methylnaphthalene	**1500000**	H8, D12	280000	3300	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Acenaphthene	**1600000**	H8, D12	280000	3300	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Anthracene	**2000000**	H8, D12	280000	7200	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Benzo[a]anthracene	**2200000**	H8, D12	280000	4800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Benzo[a]pyrene	**1800000**	H8, D12	280000	6800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Benzo[b]fluoranthene	**1200000**	H8, D12	280000	5500	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Benzo[g,h,i]perylene	**860000**	H8, D12	280000	3300	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Benzo[k]fluoranthene	**500000**	H8, D12	280000	3200	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Chrysene	**2200000**	H8, D12	280000	2800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Fluoranthene	**3100000**	H8, D12	280000	4000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Fluorene	**1100000**	H8, D12	280000	6500	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Indeno[1,2,3-cd]pyrene	**530000**	H8, D12	280000	7800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Naphthalene	**1800000**	H8, D12	280000	4700	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Phenanthrene	**6800000**	H8, D12	280000	5800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Pyrene	**5000000**	H8, D12	280000	1800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
General Chemistry Parameters										
Percent Solids	**77**		0.010	NR	%	1.00	11/23/09 13:36	JRR	9K23026	Dry Weight

Golder Associates, Inc. - Niagara Falls, NY
2221 Niagara Falls Blvd., Ste 9
Niagara Falls, NY 14304

Work Order: RSK0944

Project: Golder - Vandermark/Isochem site
Project Number: [none]

Received: 11/19/09
Reported: 12/10/09 09:29

Sample Summary

Sample Identification	Lab Number	Client Matrix	Date/Time Sampled	Date/Time Received	Sample Qualifiers
VANDEMARK DNAPL	RSK0944-01	Waste	11/18/09 14:30	11/19/09 17:45	

Golder Associates, Inc. - Niagara Falls, NY
2221 Niagara Falls Blvd., Ste 9
Niagara Falls, NY 14304

Work Order: RSK0944

Project: Golder - Vandermark/Isochem site
Project Number: [none]

Received: 11/19/09
Reported: 12/10/09 09:29

Analytical Report

Sample ID: RSK0944-01 (VANDEMARK DNAPL - Waste) **Sampled: 11/18/09 14:30** **Recvd: 11/19/09 17:45**

Volatile Organic Compounds by EPA 8260B

Analyte	Sample Result	Data Qualifiers	RL	MDL	Units	Dil Fac	Date Analyzed	Lab Tech	Batch	Method
1,1,1-Trichloroethane	ND	W1, D04	560	41	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,1,2,2-Tetrachloroethane	ND	W1, D04	560	91	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,1,2-Trichloroethane	ND	W1, D04	560	28	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,1,2-Trichlorotrifluoroethane	ND	W1, D04	560	280	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,1-Dichloroethane	ND	W1, D04	560	28	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,1-Dichloroethene	ND	W1, D04	560	69	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,2,4-Trichlorobenzene	ND	W1, D04	560	34	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,2-Dibromo-3-chloropropane	ND	W1, D04	560	280	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,2-Dibromoethane (EDB)	ND	W1, D04	560	21	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,2-Dichlorobenzene	ND	W1, D04	560	44	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,2-Dichloroethane	ND	W1, D04	560	28	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,2-Dichloropropane	ND	W1, D04	560	280	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,3-Dichlorobenzene	ND	W1, D04	560	29	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,4-Dichlorobenzene	ND	W1, D04	560	78	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
2-Butanone (MEK)	ND	W1, D04	2800	200	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
2-Hexanone	ND	W1, D04	2800	190	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
4-Methyl-2-pentanone (MIBK)	ND	W1, D04	2800	180	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Acetone	ND	W1, D04	2800	120	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Benzene	ND	W1, D04	560	27	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Bromodichloromethane	ND	W1, D04	560	29	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Bromoform	ND	W1, D04	560	280	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Bromomethane	ND	W1, D04	560	120	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Carbon disulfide	ND	W1, D04	560	48	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Carbon Tetrachloride	ND	W1, D04	560	54	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Chlorobenzene	ND	W1, D04	560	74	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Chlorodibromomethane	ND	W1, D04	560	31	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Chloroethane	ND	W1, D04	560	240	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Chloroform	ND	W1, D04	560	34	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Chloromethane	ND	W1, D04	560	34	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
cis-1,2-Dichloroethene	ND	W1, D04	560	28	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
cis-1,3-Dichloropropene	ND	W1, D04	560	31	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Cyclohexane	ND	W1, D04	560	26	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Dichlorodifluoromethane	ND	W1, D04	560	46	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Ethylbenzene	**460**	W1, D04,J	560	38	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Isopropylbenzene	ND	W1, D04	560	84	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Methyl Acetate	ND	W1, D04	560	30	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Methyl tert-Butyl Ether	ND	W1, D04	560	55	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Methylcyclohexane	ND	W1, D04	560	36	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Methylene Chloride	ND	W1, D04	560	110	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Styrene	ND	W1, D04	560	28	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Tetrachloroethene	ND	W1, D04	560	75	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Toluene	ND	W1, D04	560	43	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
trans-1,2-Dichloroethene	ND	W1, D04	560	58	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
trans-1,3-Dichloropropene	ND	W1, D04	560	27	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Trichloroethene	ND	W1, D04	560	38	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Trichlorofluoromethane	ND	W1, D04	560	53	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B

Golder Associates, Inc. - Niagara Falls, NY
2221 Niagara Falls Blvd., Ste 9
Niagara Falls, NY 14304

Work Order: RSK0944

Project: Golder - Vandermark/Isochem site
Project Number: [none]

Received: 11/19/09
Reported: 12/10/09 09:29

Analytical Report

Analyte	Sample Result	Data Qualifiers	RL	MDL	Units	Dil Fac	Date Analyzed	Lab Tech	Batch	Method
Sample ID: RSK0944-01 (VANDEMARK DNAPL - Waste) - cont.						**Sampled: 11/18/09 14:30**		**Recvd: 11/19/09 17:45**		
Volatile Organic Compounds by EPA 8260B - cont.										
Vinyl chloride	ND	W1, D04	1100	68	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
Xylenes, total	**370**	W1, D04,J	1100	94	ug/kg dry	5.00	11/30/09 22:40	TWS	9K30023	8260B
1,2-Dichloroethane-d4	*104 %*	*W1, D04*	*Surr Limits: (10-190%)*				*11/30/09 22:40*	*TWS*	*9K30023*	*8260B*
4-Bromofluorobenzene	*86 %*	*W1, D04*	*Surr Limits: (10-190%)*				*11/30/09 22:40*	*TWS*	*9K30023*	*8260B*
Toluene-d8	*93 %*	*W1, D04*	*Surr Limits: (10-190%)*				*11/30/09 22:40*	*TWS*	*9K30023*	*8260B*
Semivolatile Organics by GC/MS										
2,4,5-Trichlorophenol	ND	H8, D12	280000	62000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2,4,6-Trichlorophenol	ND	H8, D12,L	280000	18000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2,4-Dichlorophenol	ND	H8, D12	280000	15000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2,4-Dimethylphenol	ND	H8, D12	280000	77000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2,4-Dinitrophenol	ND	H8, D12	550000	98000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2,4-Dinitrotoluene	ND	H8, D12,L	280000	43000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2,6-Dinitrotoluene	ND	H8, D12	280000	68000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2-Chloronaphthalene	ND	H8, D12	280000	18000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2-Chlorophenol	ND	H8, D12	280000	14000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2-Methylnaphthalene	**1500000**	H8, D12	280000	3300	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2-Methylphenol	ND	H8, D12	280000	8700	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2-Nitroaniline	ND	H8, D12	550000	90000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2-Nitrophenol	ND	H8, D12	280000	13000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
3 & 4 Methylphenol	ND	H8, D12	550000	16000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
3,3'-Dichlorobenzidine	ND	H8, D12,L	280000	250000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
3-Nitroaniline	ND	H8, D12	550000	65000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
4,6-Dinitro-2-methylphenol	ND	H8, D12	550000	97000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
4-Bromophenyl phenyl ether	ND	H8, D12	280000	90000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
4-Chloro-3-methylphenol	ND	H8, D12	280000	12000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
4-Chloroaniline	ND	H8, D12	280000	83000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
4-Chlorophenyl phenyl ether	ND	H8, D12	280000	6000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
4-Nitroaniline	ND	H8, D12	550000	32000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
4-Nitrophenol	ND	H8, D12,L	550000	68000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Acenaphthene	**1600000**	H8, D12	280000	3300	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Acenaphthylene	ND	H8, D12	280000	2300	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Acetophenone	ND	H8, D12,L	280000	14000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Anthracene	**2000000**	H8, D12	280000	7200	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Atrazine	ND	H8, D12	280000	12000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Benzaldehyde	ND	H8, D12,L	280000	32000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Benzo[a]anthracene	**2200000**	H8, D12	280000	4800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Benzo[a]pyrene	**1800000**	H8, D12	280000	6800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Benzo[b]fluoranthene	**1200000**	H8, D12	280000	5500	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Benzo[g,h,i]perylene	**860000**	H8, D12	280000	3300	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Benzo[k]fluoranthene	**500000**	H8, D12	280000	3200	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Biphenyl	ND	H8, D12	280000	18000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Bis(2-chloroethoxy)methane	ND	H8, D12	280000	15000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Bis(2-chloroethyl)ether	ND	H8, D12	280000	25000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Bis(2-chloroisopropyl) ether	ND	H8, D12	280000	30000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C

Golder Associates, Inc. - Niagara Falls, NY
2221 Niagara Falls Blvd., Ste 9
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Work Order: RSK0944

Project: Golder - Vandermark/Isochem site
Project Number: [none]

Received: 11/19/09
Reported: 12/10/09 09:29

Analytical Report

Sample ID: RSK0944-01 (VANDEMARK DNAPL - Waste) - cont. **Sampled: 11/18/09 14:30** **Recvd: 11/19/09 17:45**

Analyte	Sample Result	Data Qualifiers	RL	MDL	Units	Dil Fac	Date Analyzed	Lab Tech	Batch	Method
Semivolatile Organics by GC/MS - cont.										
Bis(2-ethylhexyl) phthalate	ND	H8, D12	280000	90000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Butyl benzyl phthalate	ND	H8, D12	280000	75000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Caprolactam	ND	H8, D12	280000	120000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Carbazole	ND	H8, D12	280000	3300	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Chrysene	**2200000**	H8, D12	280000	2800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Dibenz[a,h]anthracene	ND	H8, D12	280000	3300	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Dibenzofuran	ND	H8, D12	280000	3000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Diethyl phthalate	ND	H8, D12	280000	8500	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Dimethyl phthalate	ND	H8, D12	280000	7300	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Di-n-butyl phthalate	ND	H8, D12	280000	97000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Di-n-octyl phthalate	ND	H8, D12	280000	6500	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Fluoranthene	**3100000**	H8, D12	280000	4000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Fluorene	**1100000**	H8, D12	280000	6500	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Hexachlorobenzene	ND	H8, D12	280000	14000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Hexachlorobutadiene	ND	H8, D12	280000	14000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Hexachlorocyclopentadiene	ND	H8, D12	280000	85000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Hexachloroethane	ND	H8, D12	280000	22000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Indeno[1,2,3-cd]pyrene	**530000**	H8, D12	280000	7800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Isophorone	ND	H8, D12	280000	14000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Naphthalene	**1800000**	H8, D12	280000	4700	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Nitrobenzene	ND	H8, D12	280000	12000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
N-Nitrosodi-n-propylamine	ND	H8, D12	280000	22000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
N-Nitrosodiphenylamine	ND	H8, D12,L	280000	15000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Pentachlorophenol	ND	H8, D12	550000	97000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Phenanthrene	**6800000**	H8, D12	280000	5800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Phenol	ND	H8, D12	280000	30000	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
Pyrene	**5000000**	H8, D12	280000	1800	ug/kg	100	12/04/09 17:33	MKP	9L03042	8270C
2,4,6-Tribromophenol	*	*H8, D12,Z3*	*Surr Limits: (39-146%)*				*12/04/09 17:33*	*MKP*	*9L03042*	*8270C*
2-Fluorobiphenyl	*92 %*	*H8, D12*	*Surr Limits: (37-120%)*				*12/04/09 17:33*	*MKP*	*9L03042*	*8270C*
2-Fluorophenol	*63 %*	*H8, D12*	*Surr Limits: (18-120%)*				*12/04/09 17:33*	*MKP*	*9L03042*	*8270C*
Nitrobenzene-d5	*78 %*	*H8, D12*	*Surr Limits: (34-132%)*				*12/04/09 17:33*	*MKP*	*9L03042*	*8270C*
Phenol-d5	*77 %*	*H8, D12*	*Surr Limits: (11-120%)*				*12/04/09 17:33*	*MKP*	*9L03042*	*8270C*
p-Terphenyl-d14	*88 %*	*H8, D12*	*Surr Limits: (58-147%)*				*12/04/09 17:33*	*MKP*	*9L03042*	*8270C*
General Chemistry Parameters										
Percent Solids	**77**		0.010	NR	%	1.00	11/23/09 13:36	JRR	9K23026	Dry Weight

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SAMPLE EXTRACTION DATA

Parameter	Batch	Lab Number	Wt/Vol Extracte	Units	Extract Volume	Units	Date Prepared	Lab Tech	Extraction Method
General Chemistry Parameters									
Dry Weight	9K23026	RSK0944-01	10.00	g	10.00	g	11/23/09 10:35	JRR	Dry Weight
Semivolatile Organics by GC/MS									
8270C	9L03042	RSK0944-01	0.12	g	1.00	mL	12/03/09 21:00	KMB	3580A
Volatile Organic Compounds by EPA 8260B									
8260B	9K30023	RSK0944-01	5.78	g	500.00	mL	11/30/09 13:09	TRB	Methanol Prep

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LABORATORY QC DATA

Analyte	Source Result	Spike Level	RL	MDL	Units	Result	% REC	% REC Limits	% RPD	RPD Limit	Data Qualifiers
Volatile Organic Compounds by EPA 8260B											
Blank Analyzed: 11/30/09 (Lab Number:9K30023-BLK1, Batch: 9K30023)											
1,1,1-Trichloroethane			98	7.1	ug/kg wet	ND					
1,1,2,2-Tetrachloroethane			98	16	ug/kg wet	ND					
1,1,2-Trichloroethane			98	4.9	ug/kg wet	ND					
1,1,2-Trichlorotrifluoroethane			98	49	ug/kg wet	ND					
1,1-Dichloroethane			98	4.9	ug/kg wet	ND					
1,1-Dichloroethene			98	12	ug/kg wet	ND					
1,2,4-Trichlorobenzene			98	6.0	ug/kg wet	ND					
1,2-Dibromo-3-chloropropane			98	49	ug/kg wet	ND					
1,2-Dibromoethane (EDB)			98	3.7	ug/kg wet	ND					
1,2-Dichlorobenzene			98	7.6	ug/kg wet	ND					
1,2-Dichloroethane			98	4.9	ug/kg wet	ND					
1,2-Dichloropropane			98	49	ug/kg wet	ND					
1,3-Dichlorobenzene			98	5.1	ug/kg wet	ND					
1,4-Dichlorobenzene			98	14	ug/kg wet	ND					
2-Butanone (MEK)			490	35	ug/kg wet	270					J
2-Hexanone			490	33	ug/kg wet	ND					
4-Methyl-2-pentanone (MIBK)			490	31	ug/kg wet	ND					
Acetone			490	22	ug/kg wet	ND					
Benzene			98	4.7	ug/kg wet	ND					
Bromodichloromethane			98	5.1	ug/kg wet	ND					
Bromoform			98	49	ug/kg wet	ND					
Bromomethane			98	22	ug/kg wet	ND					
Carbon disulfide			98	8.4	ug/kg wet	ND					
Carbon Tetrachloride			98	9.4	ug/kg wet	ND					
Chlorobenzene			98	13	ug/kg wet	ND					
Chlorodibromomethane			98	5.5	ug/kg wet	ND					
Chloroethane			98	41	ug/kg wet	ND					
Chloroform			98	6.0	ug/kg wet	ND					
Chloromethane			98	5.9	ug/kg wet	ND					
cis-1,2-Dichloroethene			98	4.9	ug/kg wet	ND					
cis-1,3-Dichloropropene			98	5.5	ug/kg wet	ND					
Cyclohexane			98	4.5	ug/kg wet	ND					
Dichlorodifluoromethane			98	8.0	ug/kg wet	ND					
Ethylbenzene			98	6.7	ug/kg wet	ND					
Isopropylbenzene			98	15	ug/kg wet	ND					

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LABORATORY QC DATA

Analyte	Source Result	Spike Level	RL	MDL	Units	Result	% REC	% REC Limits	% RPD	RPD Limit	Data Qualifiers
Volatile Organic Compounds by EPA 8260B											
Blank Analyzed: 11/30/09 (Lab Number:9K30023-BLK1, Batch: 9K30023)											
Methyl Acetate			98	5.3	ug/kg wet	ND					
Methyl tert-Butyl Ether			98	9.6	ug/kg wet	ND					
Methylcyclohexane			98	6.4	ug/kg wet	ND					
Methylene Chloride			98	19	ug/kg wet	42					J
Styrene			98	4.9	ug/kg wet	ND					
Tetrachloroethene			98	13	ug/kg wet	ND					
Toluene			98	7.5	ug/kg wet	ND					
trans-1,2-Dichloroethene			98	10	ug/kg wet	ND					
trans-1,3-Dichloropropene			98	4.7	ug/kg wet	ND					
Trichloroethene			98	6.7	ug/kg wet	ND					
Trichlorofluoromethane			98	9.2	ug/kg wet	ND					
Vinyl chloride			200	12	ug/kg wet	ND					
Xylenes, total			200	16	ug/kg wet	ND					
Surrogate: 1,2-Dichloroethane-d4					*ug/kg wet*		*115*	*10-190*			
Surrogate: 4-Bromofluorobenzene					*ug/kg wet*		*102*	*10-190*			
Surrogate: Toluene-d8					*ug/kg wet*		*115*	*10-190*			
LCS Analyzed: 11/30/09 (Lab Number:9K30023-BS1, Batch: 9K30023)											
1,1-Dichloroethene		2490	100	12	ug/kg wet	2870	115	10-190			
Benzene		2490	100	4.8	ug/kg wet	2800	113	10-190			
Chlorobenzene		2490	100	13	ug/kg wet	2700	108	10-190			
Toluene		2490	100	7.6	ug/kg wet	2720	109	10-190			
Trichloroethene		2490	100	6.8	ug/kg wet	2670	107	10-190			
Surrogate: 1,2-Dichloroethane-d4					*ug/kg wet*		*116*	*10-190*			
Surrogate: 4-Bromofluorobenzene					*ug/kg wet*		*104*	*10-190*			
Surrogate: Toluene-d8					*ug/kg wet*		*116*	*10-190*			

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LABORATORY QC DATA

Analyte	Source Result	Spike Level	RL	MDL	Units	Result	% REC	% REC Limits	% RPD	RPD Limit	Data Qualifiers
Semivolatile Organics by GC/MS											
Blank Analyzed: 12/04/09 (Lab Number:9L03042-BLK1, Batch: 9L03042)											
2,4,5-Trichlorophenol			3400	740	ug/kg	ND					
2,4,6-Trichlorophenol			3400	220	ug/kg	ND					
2,4-Dichlorophenol			3400	180	ug/kg	ND					
2,4-Dimethylphenol			3400	920	ug/kg	ND					
2,4-Dinitrophenol			6600	1200	ug/kg	ND					
2,4-Dinitrotoluene			3400	520	ug/kg	ND					
2,6-Dinitrotoluene			3400	820	ug/kg	ND					
2-Chloronaphthalene			3400	220	ug/kg	ND					
2-Chlorophenol			3400	170	ug/kg	ND					
2-Methylnaphthalene			3400	40	ug/kg	ND					
2-Methylphenol			3400	100	ug/kg	ND					
2-Nitroaniline			6600	1100	ug/kg	ND					
2-Nitrophenol			3400	150	ug/kg	ND					
3 & 4 Methylphenol			6600	190	ug/kg	ND					
3,3'-Dichlorobenzidine			3400	3000	ug/kg	ND					
3-Nitroaniline			6600	780	ug/kg	ND					
4,6-Dinitro-2-methylphenol			6600	1200	ug/kg	ND					
4-Bromophenyl phenyl ether			3400	1100	ug/kg	ND					
4-Chloro-3-methylphenol			3400	140	ug/kg	ND					
4-Chloroaniline			3400	1000	ug/kg	ND					
4-Chlorophenyl phenyl ether			3400	72	ug/kg	ND					
4-Nitroaniline			6600	380	ug/kg	ND					
4-Nitrophenol			6600	820	ug/kg	ND					
Acenaphthene			3400	40	ug/kg	ND					
Acenaphthylene			3400	28	ug/kg	ND					
Acetophenone			3400	170	ug/kg	ND					
Anthracene			3400	86	ug/kg	ND					
Atrazine			3400	150	ug/kg	ND					
Benzaldehyde			3400	380	ug/kg	ND					
Benzo[a]anthracene			3400	58	ug/kg	ND					
Benzo[a]pyrene			3400	82	ug/kg	ND					
Benzo[b]fluoranthene			3400	66	ug/kg	ND					
Benzo[g,h,i]perylene			3400	40	ug/kg	ND					
Benzo[k]fluoranthene			3400	38	ug/kg	ND					
Biphenyl			3400	220	ug/kg	ND					

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LABORATORY QC DATA

Analyte	Source Result	Spike Level	RL	MDL	Units	Result	% REC	% REC Limits	% RPD	RPD Limit	Data Qualifiers
Semivolatile Organics by GC/MS											
Blank Analyzed: 12/04/09 (Lab Number:9L03042-BLK1, Batch: 9L03042)											
Bis(2-chloroethoxy)methane			3400	180	ug/kg	ND					
Bis(2-chloroethyl)ether			3400	300	ug/kg	ND					
Bis(2-chloroisopropyl) ether			3400	360	ug/kg	ND					
Bis(2-ethylhexyl) phthalate			3400	1100	ug/kg	ND					
Butyl benzyl phthalate			3400	900	ug/kg	ND					
Caprolactam			3400	1500	ug/kg	ND					
Carbazole			3400	40	ug/kg	ND					
Chrysene			3400	34	ug/kg	ND					
Dibenz[a,h]anthracene			3400	40	ug/kg	ND					
Dibenzofuran			3400	36	ug/kg	ND					
Diethyl phthalate			3400	100	ug/kg	ND					
Dimethyl phthalate			3400	88	ug/kg	ND					
Di-n-butyl phthalate			3400	1200	ug/kg	ND					
Di-n-octyl phthalate			3400	78	ug/kg	ND					
Fluoranthene			3400	48	ug/kg	ND					
Fluorene			3400	78	ug/kg	ND					
Hexachlorobenzene			3400	170	ug/kg	ND					
Hexachlorobutadiene			3400	170	ug/kg	ND					
Hexachlorocyclopentadiene			3400	1000	ug/kg	ND					
Hexachloroethane			3400	260	ug/kg	ND					
Indeno[1,2,3-cd]pyrene			3400	94	ug/kg	ND					
Isophorone			3400	170	ug/kg	ND					
Naphthalene			3400	56	ug/kg	ND					
Nitrobenzene			3400	150	ug/kg	ND					
N-Nitrosodi-n-propylamine			3400	260	ug/kg	ND					
N-Nitrosodiphenylamine			3400	180	ug/kg	ND					
Pentachlorophenol			6600	1200	ug/kg	ND					
Phenanthrene			3400	70	ug/kg	ND					
Phenol			3400	360	ug/kg	ND					
Pyrene			3400	22	ug/kg	ND					
Surrogate: 2,4,6-Tribromophenol					*ug/kg*		*86*	*39-146*			
Surrogate: 2-Fluorobiphenyl					*ug/kg*		*116*	*37-120*			
Surrogate: 2-Fluorophenol					*ug/kg*		*100*	*18-120*			

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LABORATORY QC DATA

Analyte	Source Result	Spike Level	RL	MDL	Units	Result	% REC	% REC Limits	% RPD	RPD Limit	Data Qualifiers
Semivolatile Organics by GC/MS											
Blank Analyzed: 12/04/09 (Lab Number:9L03042-BLK1, Batch: 9L03042)											
Surrogate: Nitrobenzene-d5					*ug/kg*		*121*	*34-132*			
Surrogate: Phenol-d5					*ug/kg*		*105*	*11-120*			
Surrogate: p-Terphenyl-d14					*ug/kg*		*107*	*58-147*			
LCS Analyzed: 12/04/09 (Lab Number:9L03042-BS1, Batch: 9L03042)											
2,4,5-Trichlorophenol		1000000	3400	740	ug/kg	1180000	118	59-126			
2,4,6-Trichlorophenol		1000000	3400	220	ug/kg	1240000	124	59-123			L
2,4-Dichlorophenol		1000000	3400	180	ug/kg	1160000	116				
2,4-Dimethylphenol		1000000	3400	920	ug/kg	1150000	115				
2,4-Dinitrophenol		1000000	6600	1200	ug/kg	1150000	115	35-146			
2,4-Dinitrotoluene		1000000	3400	520	ug/kg	1270000	127	55-125			L
2,6-Dinitrotoluene		1000000	3400	820	ug/kg	1220000	122	66-128			
2-Chloronaphthalene		1000000	3400	220	ug/kg	1120000	112				
2-Chlorophenol		1000000	3400	170	ug/kg	1040000	104	38-120			
2-Methylnaphthalene		1000000	3400	40	ug/kg	1190000	119				
2-Methylphenol		1000000	3400	100	ug/kg	1080000	108				
2-Nitroaniline		1000000	6600	1100	ug/kg	1280000	128	61-130			
2-Nitrophenol		1000000	3400	150	ug/kg	1130000	113	50-120			
3 & 4 Methylphenol		1000000	6600	190	ug/kg	1090000	109	50-119			
3,3'-Dichlorobenzidine		1000000	3400	3000	ug/kg	1390000	139	48-126			L
3-Nitroaniline		1000000	6600	780	ug/kg	1090000	109	61-127			
4,6-Dinitro-2-methylphenol		1000000	6600	1200	ug/kg	1420000	142	49-155			
4-Bromophenyl phenyl ether		1000000	3400	1100	ug/kg	1200000	120	58-131			
4-Chloro-3-methylphenol		1000000	3400	140	ug/kg	1220000	122	49-125			
4-Chloroaniline		1000000	3400	1000	ug/kg	1120000	112	49-120			
4-Chlorophenyl phenyl ether		1000000	3400	72	ug/kg	1150000	115	63-124			
4-Nitroaniline		1000000	6600	380	ug/kg	1120000	112	63-128			
4-Nitrophenol		1000000	6600	820	ug/kg	1390000	139	43-137			L
Acenaphthene		1000000	3400	40	ug/kg	1160000	116	60-120			
Acenaphthylene		1000000	3400	28	ug/kg	1190000	119				
Acetophenone		1000000	3400	170	ug/kg	1200000	120	66-120			L
Anthracene		1000000	3400	86	ug/kg	1170000	117				
Atrazine		1000000	3400	150	ug/kg	1170000	117				
Benzaldehyde		1000000	3400	380	ug/kg	1400000	140	21-120			L
Benzo[a]anthracene		1000000	3400	58	ug/kg	1140000	114				
Benzo[a]pyrene		1000000	3400	82	ug/kg	1260000	126				

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LABORATORY QC DATA

Analyte	Source Result	Spike Level	RL	MDL	Units	Result	% REC	% REC Limits	% RPD	RPD Limit	Data Qualifiers
Semivolatile Organics by GC/MS											
LCS Analyzed: 12/04/09 (Lab Number:9L03042-BS1, Batch: 9L03042)											
Benzo[b]fluoranthene		1000000	3400	66	ug/kg	1100000	110				
Benzo[g,h,i]perylene		1000000	3400	40	ug/kg	1250000	125				
Benzo[k]fluoranthene		1000000	3400	38	ug/kg	1190000	119				
Biphenyl		1000000	3400	220	ug/kg	1120000	112	71-120			
Bis(2-chloroethoxy)methane		1000000	3400	180	ug/kg	1010000	101	61-133			
Bis(2-chloroethyl)ether		1000000	3400	300	ug/kg	955000	95	45-120			
Bis(2-chloroisopropyl) ether		1000000	3400	360	ug/kg	975000	97				
Bis(2-ethylhexyl) phthalate		1000000	3400	1100	ug/kg	1130000	113				
Butyl benzyl phthalate		1000000	3400	900	ug/kg	1160000	116				
Caprolactam		1000000	3400	1500	ug/kg	1170000	117	54-133			
Carbazole		1000000	3400	40	ug/kg	1160000	116	59-129			
Chrysene		1000000	3400	34	ug/kg	1140000	114				
Dibenz[a,h]anthracene		1000000	3400	40	ug/kg	1240000	124				
Dibenzofuran		1000000	3400	36	ug/kg	1140000	114	56-120			
Diethyl phthalate		1000000	3400	100	ug/kg	1210000	121				
Dimethyl phthalate		1000000	3400	88	ug/kg	1170000	117				
Di-n-butyl phthalate		1000000	3400	1200	ug/kg	1200000	120				
Di-n-octyl phthalate		1000000	3400	78	ug/kg	1110000	111				
Fluoranthene		1000000	3400	48	ug/kg	1190000	119				
Fluorene		1000000	3400	78	ug/kg	1180000	118				
Hexachlorobenzene		1000000	3400	170	ug/kg	1170000	117				
Hexachlorobutadiene		1000000	3400	170	ug/kg	1150000	115				
Hexachlorocyclopentadiene		1000000	3400	1000	ug/kg	1180000	118				
Hexachloroethane		1000000	3400	260	ug/kg	1120000	112	41-120			
Indeno[1,2,3-cd]pyrene		1000000	3400	94	ug/kg	1260000	126				
Isophorone		1000000	3400	170	ug/kg	1100000	110				
Naphthalene		1000000	3400	56	ug/kg	1130000	113				
Nitrobenzene		1000000	3400	150	ug/kg	1220000	122	42-131			
N-Nitrosodi-n-propylamine		1000000	3400	260	ug/kg	1040000	104	46-120			
N-Nitrosodiphenylamine		1000000	3400	180	ug/kg	1450000	145	20-119			L
Pentachlorophenol		1000000	6600	1200	ug/kg	1170000	117	39-136			
Phenanthrene		1000000	3400	70	ug/kg	1180000	118				
Phenol		1000000	3400	360	ug/kg	1060000	106	17-120			
Pyrene		1000000	3400	22	ug/kg	1160000	116	58-136			

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LABORATORY QC DATA

Analyte	Source Result	Spike Level	RL	MDL	Units	Result	% REC	% REC Limits	% RPD	RPD Limit	Data Qualifiers
Semivolatile Organics by GC/MS											
LCS Analyzed: 12/04/09 (Lab Number:9L03042-BS1, Batch: 9L03042)											
Surrogate: 2,4,6-Tribromophenol					*ug/kg*		*113*	*39-146*			
Surrogate: 2-Fluorobiphenyl					*ug/kg*		*110*	*37-120*			
Surrogate: 2-Fluorophenol					*ug/kg*		*101*	*18-120*			
Surrogate: Nitrobenzene-d5					*ug/kg*		*116*	*34-132*			
Surrogate: Phenol-d5					*ug/kg*		*103*	*11-120*			
Surrogate: p-Terphenyl-d14					*ug/kg*		*97*	*58-147*			
LCS Dup Analyzed: 12/04/09 (Lab Number:9L03042-BSD1, Batch: 9L03042)											
2,4,5-Trichlorophenol	1000000	3400	740		ug/kg	1080000	108	59-126	9	18	
2,4,6-Trichlorophenol	1000000	3400	220		ug/kg	1070000	107	59-123	15	19	
2,4-Dichlorophenol	1000000	3400	180		ug/kg	1030000	103		13		
2,4-Dimethylphenol	1000000	3400	920		ug/kg	973000	97		17		
2,4-Dinitrophenol	1000000	6600	1200		ug/kg	1030000	103	35-146	11	22	
2,4-Dinitrotoluene	1000000	3400	520		ug/kg	1140000	114	55-125	11	20	
2,6-Dinitrotoluene	1000000	3400	820		ug/kg	1090000	109	66-128	11	15	
2-Chloronaphthalene	1000000	3400	220		ug/kg	961000	96		15		
2-Chlorophenol	1000000	3400	170		ug/kg	970000	97	38-120	7	25	
2-Methylnaphthalene	1000000	3400	40		ug/kg	1020000	102		15		
2-Methylphenol	1000000	3400	100		ug/kg	1010000	101		7		
2-Nitroaniline	1000000	6600	1100		ug/kg	1140000	114	61-130	12	15	
2-Nitrophenol	1000000	3400	150		ug/kg	942000	94	50-120	19	18	R2
3 & 4 Methylphenol	1000000	6600	190		ug/kg	1000000	100	50-119	8	24	
3,3'-Dichlorobenzidine	1000000	3400	3000		ug/kg	1320000	132	48-126	5	25	L1
3-Nitroaniline	1000000	6600	780		ug/kg	1010000	101	61-127	8	19	
4,6-Dinitro-2-methylphenol	1000000	6600	1200		ug/kg	1360000	136	49-155	4	15	
4-Bromophenyl phenyl ether	1000000	3400	1100		ug/kg	1070000	107	58-131	11	15	
4-Chloro-3-methylphenol	1000000	3400	140		ug/kg	1080000	108	49-125	12	27	
4-Chloroaniline	1000000	3400	1000		ug/kg	1000000	100	49-120	11	22	
4-Chlorophenyl phenyl ether	1000000	3400	72		ug/kg	1020000	102	63-124	12	16	
4-Nitroaniline	1000000	6600	380		ug/kg	998000	100	63-128	11	24	
4-Nitrophenol	1000000	6600	820		ug/kg	1280000	128	43-137	9	25	
Acenaphthene	1000000	3400	40		ug/kg	1000000	100	60-120	14	35	
Acenaphthylene	1000000	3400	28		ug/kg	1020000	102		15		
Acetophenone	1000000	3400	170		ug/kg	1110000	111	66-120	8	20	

Golder Associates, Inc. - Niagara Falls, NY
2221 Niagara Falls Blvd., Ste 9
Niagara Falls, NY 14304

Work Order: RSK0944

Project: Golder - Vandermark/Isochem site
Project Number: [none]

Received: 11/19/09
Reported: 12/10/09 09:29

LABORATORY QC DATA

Analyte	Source Result	Spike Level	RL	MDL	Units	Result	% REC	% REC Limits	% RPD	RPD Limit	Data Qualifiers
Semivolatile Organics by GC/MS											
LCS Dup Analyzed: 12/04/09 (Lab Number:9L03042-BSD1, Batch: 9L03042)											
Anthracene		1000000	3400	86	ug/kg	1060000	106		10		
Atrazine		1000000	3400	150	ug/kg	1060000	106		10		
Benzaldehyde		1000000	3400	380	ug/kg	1250000	125	21-120	12	20	L1
Benzo[a]anthracene		1000000	3400	58	ug/kg	1050000	105		7		
Benzo[a]pyrene		1000000	3400	82	ug/kg	1180000	118		6		
Benzo[b]fluoranthene		1000000	3400	66	ug/kg	1040000	104		5		
Benzo[g,h,i]perylene		1000000	3400	40	ug/kg	1180000	118		6		
Benzo[k]fluoranthene		1000000	3400	38	ug/kg	1130000	113		5		
Biphenyl		1000000	3400	220	ug/kg	957000	96	71-120	15	20	
Bis(2-chloroethoxy)methane		1000000	3400	180	ug/kg	885000	88	61-133	14	17	
Bis(2-chloroethyl)ether		1000000	3400	300	ug/kg	867000	87	45-120	10	21	
Bis(2-chloroisopropyl) ether		1000000	3400	360	ug/kg	873000	87		11		
Bis(2-ethylhexyl) phthalate		1000000	3400	1100	ug/kg	1020000	102		10		
Butyl benzyl phthalate		1000000	3400	900	ug/kg	1070000	107		8		
Caprolactam		1000000	3400	1500	ug/kg	1040000	104	54-133	12	20	
Carbazole		1000000	3400	40	ug/kg	1030000	103	59-129	12	20	
Chrysene		1000000	3400	34	ug/kg	1060000	106		7		
Dibenz[a,h]anthracene		1000000	3400	40	ug/kg	1170000	117		5		
Dibenzofuran		1000000	3400	36	ug/kg	1020000	102	56-120	11	15	
Diethyl phthalate		1000000	3400	100	ug/kg	1070000	107		12		
Dimethyl phthalate		1000000	3400	88	ug/kg	1040000	104		11		
Di-n-butyl phthalate		1000000	3400	1200	ug/kg	1070000	107		12		
Di-n-octyl phthalate		1000000	3400	78	ug/kg	1020000	102		9		
Fluoranthene		1000000	3400	48	ug/kg	1070000	107		10		
Fluorene		1000000	3400	78	ug/kg	1010000	101		15		
Hexachlorobenzene		1000000	3400	170	ug/kg	1040000	104		12		
Hexachlorobutadiene		1000000	3400	170	ug/kg	993000	99		15		
Hexachlorocyclopentadiene		1000000	3400	1000	ug/kg	958000	96		20		
Hexachloroethane		1000000	3400	260	ug/kg	1000000	100	41-120	11	46	
Indeno[1,2,3-cd]pyrene		1000000	3400	94	ug/kg	1200000	120		5		
Isophorone		1000000	3400	170	ug/kg	961000	96		13		
Naphthalene		1000000	3400	56	ug/kg	964000	96		16		
Nitrobenzene		1000000	3400	150	ug/kg	1030000	103	42-131	17	24	
N-Nitrosodi-n-propylamine		1000000	3400	260	ug/kg	967000	97	46-120	7	31	
N-Nitrosodiphenylamine		1000000	3400	180	ug/kg	1300000	130	20-119	11	15	L1

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Received: 11/19/09
Reported: 12/10/09 09:29

LABORATORY QC DATA

Analyte	Source Result	Spike Level	RL	MDL	Units	Result	% REC	% REC Limits	% RPD	RPD Limit	Data Qualifiers
Semivolatile Organics by GC/MS											
LCS Dup Analyzed: 12/04/09 (Lab Number:9L03042-BSD1, Batch: 9L03042)											
Pentachlorophenol		1000000	6600	1200	ug/kg	1100000	110	39-136	6	35	
Phenanthrene		1000000	3400	70	ug/kg	1070000	107		10		
Phenol		1000000	3400	360	ug/kg	959000	96	17-120	10	35	
Pyrene		1000000	3400	22	ug/kg	1070000	107	58-136	8	35	
Surrogate: 2,4,6-Tribromophenol					*ug/kg*		*102*	*39-146*			
Surrogate: 2-Fluorobiphenyl					*ug/kg*		*96*	*37-120*			
Surrogate: 2-Fluorophenol					*ug/kg*		*91*	*18-120*			
Surrogate: Nitrobenzene-d5					*ug/kg*		*95*	*34-132*			
Surrogate: Phenol-d5					*ug/kg*		*97*	*11-120*			
Surrogate: p-Terphenyl-d14					*ug/kg*		*91*	*58-147*			

Chain of Custody Record

Temperature on Receipt ______

Drinking Water? Yes ☐ No ☒

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
GOLDER ASSOCIATES	PATRICK MARTIN	11/19/09	100079
Address: 2221 NIA FALLS BLVD, STE 9	Telephone Number (Area Code)/Fax Number: 716-215-0650	Lab Number	Page 1 of 1
City: NIA. FALLS / State: NY / Zip Code: 14304	Site Contact: — / Lab Contact: BRIAN FISCHER	Analysis (Attach list if more space is needed)	
Project Name and Location (State): SNPE-VANDEMARK, LOCKPORT NY	Carrier/Waybill Number		
Contract/Purchase Order/Quote No.: 093-89168			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Air	Aqueous	Sed.	Soil	DNAPL	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	8260	8270	Special Instructions/ Conditions of Receipt
VANDEMARK DNAPL (2 x 4oz)	11/18/09	19:30					X							X	X	2x4 oz JARS
~~11/18/09~~		~~14:20~~					~~X~~									

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☒ 14 Days ☐ 21 Days ☐ Other ____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Patrick T. Martin	11/19/09	1745	1. Received By: [signature]	11/19/09	1745
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy