Sterling Environmental Engineering, P.C.

53 PUTNAM STREET
SARATOGA SPRINGS, NEW YORK
BCP #C546057

REMEDIAL INVESTIGATION WORK PLAN

Prepared for:

Putnam Resources, LLC
48 Union Avenue, Suite 1A
Saratoga Springs, New York 12866

Prepared by:

Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110

October 18, 2018

"Serving our clients and the environment since 1993"

53 PUTNAM STREET
SARATOGA SPRINGS, NEW YORK
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NEW YORK STATE BROWNFIELD CLEANUP PROGRAM

53 PUTNAM STREET
SARATOGA SPRINGS, NY
SITE #C546057

REMEDIAL INVESTIGATION WORK PLAN

CERTIFICATION

I, Mark Millspaugh, certify that I am a New York State registered professional engineer and that this Remedial Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Professional Seal:

_____

Mark P. Millspaugh, P.E.
NY PE 059182

1.0 INTRODUCTION AND PURPOSE

As documented by the New York State Department of Environmental Conservation (NYSDEC) by letter dated May 16, 2017, Putnam Resources, LLC (hereinafter "Putnam Resources") submitted a complete application for participation in the Brownfield Cleanup Program (BCP) under BCP #C546057 for the site located at and known as 53 Putnam Street, Saratoga Springs, NY (the "Site"). The location of the Site is shown on Figure 1. This work plan describes the field work and implementation procedures for completion of a Remedial Investigation (RI) at the Site. The RI will be conducted and reported by Sterling Environmental Engineering, P.C. (STERLING), on behalf of Putnam Resources.

2.0 SITE DESCRIPTION AND HISTORY

The Site is currently occupied by a single-story, concrete block building identified in tax records as 0.31 acre in size and designated as parcel 165.60-1-58. An existing building occupies most of the rectangular shaped property. The building is divided into a small area for the former boiler room and a large open bay area. The former boiler room floor consists of a crumbling concrete pad approximately 1 to 2 inches in thickness. The floor of the large bay area is a combination of gravel and crushed concrete. Access to the bay area is via a large overhead door located along Putnam Street. The building currently is generally empty and is in a state of disrepair and no onsite activities/uses (e.g. storage) are occurring.

2.1 Land Use

The Site is in a commercially developed area of the City of Saratoga Springs, NY and is bounded on the east by Putnam Street and by commercial properties to the north, south, and west. The Saratoga Springs Public Library is located immediately to the east of the Site. Properties immediately to the west front on Broadway and are used as restaurants/night clubs. The property to the south is owned by Verizon Telecommunications. The portion of this property nearest the Site is paved and used for parking. The property immediately north of the Site is paved and used for parking and vehicular access.

The Site is zoned for commercial use and residential accessory use is permitted with City approval. The surrounding parcels are currently used for commercial use and may potentially provide residential accessory use according to zoning. The nearest residential neighborhood is approximately 400 feet to the east of the Site.

2.2 Site Topography

The Site lies in a north-south trending low area of the City at an elevation of approximately 290 feet above mean sea level (amsl), based on the US Geological Survey (USGS) topographic map for Saratoga Springs. Most of the Site is occupied by a building with a level interior floor comprised of crushed concrete and gravel. The west end of the property is approximately two (2) to five (5) feet higher in elevation than the east end of the property. The elevation of the ground surface increases west of the property to approximately 305 feet amsl at Broadway and increases gradually to the east.

2.3 Surface Water, Wetlands, and Floodplains

The nearest surface waterbody is Loughberry Lake, approximately one (1) mile northeast of the Site. Spring Run emanates from the south end of the Lake southward for approximately 1,000 feet before flowing west. Natural mineral springs exist approximately 800 feet south (Congress Park) and

approximately 1,900 feet north (High Rock Park) of the Site. Hawthorn Spring is located approximately 500 feet to the south of the Site at the corner of Putnam Street and Spring Street. The Site is in an urban, commercially developed area and there are no mapped floodplains or wetlands on or near the Site.

2.4 Geology and Hydrogeology

The Site is covered by a layer of fill material ranging from approximately eight (8) to twelve (12) feet thick. The fill generally consists of coarse-medium-fine sand with varying amounts of silt and gravel. The fill also contains brick, cinders and slag. Beneath the fill is soil consisting primarily of course-medium-fine sand with varying amounts of gravel, silt and clay. Layers of organic peat ranging in thickness from less than one (1) inch to as much as two (2) feet are present in the sand.

The depth to groundwater ranges from approximately six (6) to nine (9) feet below the current floor and approximately eight (8) to ten (10) feet below grade surface to the west of the building footprint. Groundwater flow in the vicinity of the building is to the south, east and southeast.

2.5 Historical Site Use

The current one-story, concrete block, slab-on-grade building was constructed in 1905. The property was initially used as an ice skating rink during the winter months and a garage during the summer. The property began conducting business as a "Steam Laundry" on or before 1925. A gasoline UST is shown on the 1952 Sanborn Map of the property located at the southeast corner of the property, outside the building. The UST is absent on later maps and a soil boring at this location during site investigations confirms the tank was removed and the absence of adverse impacts. The 1954 Sanborn Map of the area lists the Site as a Laundry/Dry Cleaners.

City directory listings indicate that the Site was vacant or not listed between the late 1960's to 1986. C&B Sanitation used the Site as a parking garage for waste hauling vehicles beginning in 1986. It is assumed that the Site has been vacant since truck storage operations ceased on or about the early 2000's.

The former 10,000 gallon No. 6 fuel oil UST shown on the 1952 Sanborn Map was removed from the area immediately west of the building circa January 2002. Approximately 173 tons of petroleum-impacted soil were removed from the vicinity of the former fuel oil tank in March 2002. NYSDEC Spill #0109572 was issued in association with the aforementioned tank removal and documented soil impacts. The spill is currently listed as "not closed."

2.6 Previous Investigations

A geotechnical investigation was completed circa 2004 by Dente Engineering P.C. (Dente) of Watervliet, New York for a potential redevelopment project that was not completed. The three (3) deep geotechnical soil borings (B-1, B-2 & B-3) were advanced utilizing a CME-55 auger drilling rig from August 10 to August 12, 2004. The locations of the borings are shown on Figure 2. The September 2004 report titled "Geotechnical Report for Proposed Parking Garage and Banquet Facility", including the boring logs for B-1, B-2, and B-3, is provided in Appendix A. Soil borings were terminated at the apparent bedrock surface at depths of 65.5 feet below ground surface (fbgs) to 69.5 fbgs. The three soil borings penetrated the entire thickness of unconsolidated material at the Site and provide a record of the geologic materials from the ground surface to the top of bedrock.

According to the descriptions in the Dente report, fill consisting of a mix of native fine sand containing masonry, construction debris, coal, ash, cinders, glass, metal, cobbles and concrete is present to a depth of approximately 11 feet. The natural soil below the fill consists of peat, and organic silt. Peat layers are described as generally two (2) to four (4) feet thick. Interbedded fine sand and fine to coarse sand layers are present at depth of 25 to 30 fbgs. Very low permeability, pre-consolidated, varved silt and clay is present below the granular sand deposits to depths of approximately 55 to 65 fbgs. Low permeability glacial till comprised of a mixture of silt, clay, sand and gravel was encountered beneath the varved silt and clay to the top of bedrock.

Previous environmental investigations have been completed at the Site by Passaretti Geological & Environmental Consultants, Inc. (Passaretti), CASmith LLC, and by STERLING to evaluate the environmental conditions at the Site under the direction of the NYSDEC Division of Environmental Remediation (DER), Spill Response Program. The investigations primarily consisted of collecting soil and groundwater samples for analysis of volatile organic compounds (VOCs) and semi-VOCs (SVOCs).

Passaretti completed removal of a former 10,000 gallon No. 6 fuel oil tank from the west side of the building, and removal of an approximate 235 gallon condensate tank in December 2001 – January 2002. Approximately 173 tons of petroleum-impacted soil were removed from the vicinity of the fuel oil tank. Some impacted soil was left in place due to infrastructure constraints.

CASmith LLC performed a Phase I Environmental Site Assessment (ESA) and Limited Subsurface Investigation of the property in August 2006. The results are presented in the Phase I Environmental Site Assessment and Limited Subsurface Investigation Report prepared by CASmith LLC, dated December 8, 2006.

Passaretti again collected soil and groundwater samples in November 2013 as part of a potential property transaction.

STERLING performed further focused investigations of the Site to evaluate soil and groundwater conditions in 2015 and 2016 that included sampling and analyzing soil and groundwater from 39 soil borings and 11 monitoring wells installed at the Site from August 10 through 14, 2015, and from an additional six (6) soil borings and six (6) monitoring wells installed from December 18 through 22, 2015. The locations of the soil borings and monitoring wells are shown on Figure 2. The results of the soil and groundwater samples are presented in the Site Investigation Report dated November 5, 2015 and the Supplemental Site Investigation Report dated February 5, 2016 (revised March 14, 2016).

The list of environmental reports for the Site for the work described above is as follows:

- Underground Storage Tank Removal Report prepared by Passaretti Geological & Environmental Consultants, Inc., dated, May 10, 2002.
- Phase I Environmental Site Assessment and Limited Subsurface Investigation Report prepared by CASmith, dated December 8, 2006.
- Laboratory data package to Ms. Mary Passaretti, dated December 23, 2013.
- Site Investigation Report prepared by STERLING, dated November 5, 2015.
- Supplemental Site Investigation Report prepared by STERLING, dated March 14, 2016.

These reports were submitted as an attachment of the BCP Application and are available for review at the Site's Document Repository, the Saratoga Springs Public Library, located at 49 Henry Street, Saratoga Springs, New York. Information and data from these reports, and any additional data collected after

entering the BCP, will be combined and presented as a Remedial Investigation (RI) Report that will comply with the requirements of the BCP.

3.0 INVESTIGATION OBJECTIVES AND RATIONALE

The NYSDEC requires the completion of a RI for sites entering the BCP, consistent with the requirements of DER-10. The objective of this RI is to:

- collect sufficient data to develop a remedy that conforms to the requirement of a Track 1 cleanup (Unrestricted Use), per 6 NYCRR Part 375.8 (e);
- delineate the areal and vertical extent of impacted media to compare to Unrestricted Use Soil Cleanup Objectives (6 NYCRR Part 375, Table 375-6.8(a));
- determine surface and subsurface characteristics of the Site, including topography, geology, and hydrogeology;
- identify sources of contamination, migration pathways, and actual or potential receptors of impacted media;
- collect and evaluate data necessary for a fish and wildlife resource impact analysis (FWRIA);
- collect and evaluate data necessary to evaluate the actual and potential threats to public health and the environment; and
- collect the data necessary to evaluate any release to an environmental medium and develop appropriate remedial alternative(s) to address identified impacts.

The RI will obtain and evaluate additional Site data required by the BCP that were not obtained during previous investigations to achieve this objective. This RIWP includes the following tasks:

- conduct a survey and prepare a map of the Site;
- collect additional soil and groundwater samples for analysis of 6 NYCRR Part 375 metals, PCBs, pesticides, herbicides, VOCs, SVOCs and emerging contaminants Per- and Polyfluoroakyl Substances (PFAS) and 1-4,-Dioxane from existing wells;
- perform a Soil Vapor Investigation; collect soil vapor, and outdoor air samples for analysis of TO-15 VOCs;
- compare analytical results to the Unrestricted Use Soil Cleanup Objectives (SCOs) identified in 6 NYCRR Part 375-6.8(a);and
- prepare and submit to the NYSDEC a RI Report consistent with the requirements of DER-10, Section 3.14.

There is no surface water on the Site. In addition, there are no concerns or exposures for wetlands, or fish and wildlife due to the urban setting. Therefore, no provisions are made in this RIWP to address these resources, as provided by DER-10 Section 3.10.1(b)4.

The Site does not have the potential to erode into or otherwise impact any on-site or off-site habitat of endangered, threatened or special concern species or other fish and wildlife resource. As such, a FWRIA is not needed based on the FWRIA Decision Key Process presented in Appendix 3C of DER-10.

4.0 SCOPE OF WORK

4.1 Site Mapping

A survey of the Site will be performed to provide a base map and a metes and bounds description of the Site. Site maps depicting sample locations will be provided in the RI Report. The survey will provide the basis for the map that will eventually accompany the Environmental Easement for the Site.

4.2 Soil Sampling and Analysis

Soil samples will be collected from eight (8) soil borings that will be drilled to allow analysis of parameters not characterized during previous investigations and to further delineate the horizontal and vertical extent of contaminants. Samples will be collected from locations and depths that supplement information available from previous investigations.

Soil encountered with visual or olfactory indications of contamination, or that exhibit elevated PID readings will be preferentially selected for laboratory analysis. The approximate location of the borings is shown on Figure 3. The actual placement of the borings may be adjusted based on field conditions to avoid obstructions such as utility lines. Actual locations may vary slightly depending on accessibility inside the building.

Soil samples will be collected using the direct-push method. The direct-push sampler consists of a stainless steel tube that is hydraulically pushed a length of approximately four (4) to five (5) feet into the ground. The sampler contains a 2-inch diameter, clear, acetate liner (sleeve) that is retrieved and cut lengthwise to allow inspection and sample collection by the onsite engineer or geologist. It is anticipated that soil borings will be advanced to a depth of thirty (30) feet. The actual depth may vary depending on field conditions and/or observations of contaminants, if any. A primary goal determining the final depth of each boring will be defining the vertical depth of contamination.

A geologic description of the samples will be recorded by the onsite engineer or geologist. The description will include the boring identification, depth interval, composition, color, moisture, photoionization detector (PID) measurements, visual and olfactory indications of contamination, and other notable features.

Public utilities will be marked in advance of drilling activities using the Dig Safely service, in accordance with New York State law.

Soil samples retrieved from each boring will be screened using a PID equipped with a 11.7 electron volt (eV) lamp. The PID will be calibrated in accordance with the manufacturer's specifications to detect volatile organic vapors. After the soil core sample is retrieved, representative portions of the soil core will be placed in sealable plastic bags labeled with a unique field identification. The soil in the bag will be

allowed to warm to enhance volatilization of compounds into the headspace of the bag. The PID probe will be inserted into the headspace of the sample bag and the maximum reading will be recorded on field forms.

A soil sample will be collected from each boring for laboratory analysis from depths of 0" to 6", 6" to 12", and 12" to 24". Soil samples also will be collected and retained for laboratory analysis at five (5) foot intervals from a depth of approximately 10 feet below grade to the bottom of each boring. Soil samples retained for laboratory analysis will be collected in laboratory-supplied jars and placed in a cooler for preservation. A chain of custody will be completed to accompany the samples during delivery to the laboratory. Soil samples will be submitted for analysis of 6 NYCRR Part 375 metals, PCBs, pesticides, herbicides, VOCs, SVOCs, and emerging contaminants PFAS and 1-4,-Dioxane. Soil cuttings will be managed as discussed in Section 4.6.

4.3 Groundwater Sampling and Analysis

Groundwater levels will be measured and one (1) groundwater sample will be collected from each of the seventeen (17) existing monitoring wells. The locations of the wells are shown on Figure 2. Prior to collecting groundwater samples, the monitoring wells will be purged following the United States Environmental Protection Agency's (USEPA's) Low-Flow sampling protocol. Field parameters, including dissolved oxygen (DO), oxidation-reduction potential (ORP), hydrogen ion activity (pH), temperature, specific conductivity, and turbidity, will be monitored using a multi-parameter meter with a flow-through cell connected directly to the pump discharge.

A pumping rate will be maintained that keeps drawdown in the monitoring well to less than 0.3 feet in accordance with the USEPA protocol. Purging will be complete when parameters remain stable over three (3) consecutive readings collected at five (5) minute intervals. If field parameters do not stabilize after removing five (5) wetted screen volumes, the condition will be noted and a groundwater sample will be collected.

Groundwater samples will be collected directly into laboratory-supplied containers and will be placed in a cooler for preservation. A chain of custody will be completed to accompany the samples during delivery to the laboratory. Soil samples will be submitted for analysis of 6 NYCRR Part 375 metals, PCBs, pesticides, herbicides, VOCs, SVOCs and the emerging contaminants, PFAS and 1,4-dioxane. Water purged from the wells will be managed as discussed in Section 4.6.

4.4 Soil Vapor Sampling and Analysis

Soil vapor probes will be installed in a separate boring drilled to a depth of approximately 10 feet below grade adjacent to each of the eight (8) soil borings described in Section 4.2 to characterize the quality of soil vapor in the unsaturated zone at the Site. One (1) ambient air sample will be collected for quality control purposes during the soil vapor sampling. Soil vapor and air sampling and analysis will be performed in accordance with the October 2006 NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York. The approximate location of the soil vapor probes and the location of the ambient/outdoor air sample is shown on Figure 3. The actual placement of the soil vapor probes may be adjusted based on field conditions.

The soil vapor probes will be constructed in accordance with Section 2.7.1 of the NYSDOH Soil Vapor Guidance and will consist of approximately five (5) feet of one-inch diameter, factory-slotted well screen and sufficient riser pipe to extend above the ground surface. The annulus of the borehole will be filled

with filter sand to a depth of approximately 4 feet. A bentonite seal will be placed from a depth of approximately 4 feet to 1 foot. Native soil will be used to fill the upper one (1) foot of the borehole. A one-quarter inch sampling port will be attached to the top of the 1-inch PVC riser pipe to allow connection of sampling equipment.

The soil vapor and air samples will be collected using Summa® canisters fitted with a laboratory calibrated critical orifice flow regulation device sized to allow the collection of the soil vapor. The observed soil vapor sample collection flow rate will be below the maximum flow rate of 0.2 Liter per minute recommended by the NYSDOH Soil Vapor Guidance to limit CVOC stripping from soil, prevent the short-circuiting of ambient air from ground surface that would dilute the soil vapor sample, and increase confidence regarding the location from which the soil vapor sample will be obtained. A sampling duration between 8 and 12 hours is anticipated.

Prior to soil vapor sampling, each soil vapor probe will be purged of a minimum of one (1) volume to ensure soil vapor is drawn into the probe. Once purging is completed, sample tubing from the top of the soil vapor probe will be attached directly to a Summa® canister. A Sample Collection Form will be completed for each sub-slab soil vapor sample to document the conditions during sampling.

Prior to collecting a soil vapor sample, a helium tracer test will be conducted to ensure that the sampling tubing and sample port are properly sealed. The helium tracer test will be conducted using a shroud, helium gas as a tracer, and a helium detector. A shroud will be placed over the sampling port and tubing and completely sealed to preclude intrusion of outside air. Helium gas will be introduced into the shroud. A helium detector will be used to test the sampling port and tubing for the presence of helium to verify that helium is not leaking into the sampling port and tubing. If helium is present in the sampling port or tubing, the sampling port and tubing will be resealed and an additional helium tracer test will be conducted until it is established that leakage is not occurring.

The Summa® canister samples will be submitted to a NYSDOH certified analytical laboratory for analysis of VOCs by USEPA Method TO-15.

4.5 Equipment Decontamination

Drilling rods and sampling equipment and other reusable equipment that is in contact with potentially impacted soil or groundwater will be decontaminated using a non-phosphate detergent followed by rinsing with potable water. Water generated during decontamination will be captured on polyethylene sheeting and containerized for disposal at a permitted facility, or properly managed during Site remediation.

When sampling for PFCs, standard two step decontamination using only Alconox and Liquinox detergent and PFAS-free water rinse will be performed for equipment that comes in contact with potential PFC-containing materials (e.g. aluminum foil, low density polyethylene, polytetrafluoroethylene, etc.). Quality control measures that may affect equipment decontamination and cross contamination are described in Section 6.0.

4.6 Investigation Derived Waste

Investigation derived waste (IDW) is expected to be minimal and limited to a small quantity of soil from the six (6) proposed soil borings (Section 4.2), potentially impacted water from purging monitoring wells and decontamination procedures and personal protective equipment (PPE).

Potentially impacted soil and PPE will be placed in a NYSDOT 55-gallon drum, labeled, and stored onsite until properly managed during Site remediation. IDW will be managed following all applicable local, State and Federal statutes, regulations and guidance for disposal of non-hazardous waste.

5.0 QUALITATIVE EXPOSURE ASSESSMENT

A qualitative exposure assessment will be performed to determine the route, intensity, frequency, and duration of actual or potential exposures of humans and/or fish and wildlife to contaminants, as required by DER-10, Section 3.3(c)4. The assessment will evaluate the contaminants that may be migrating from the site, if any, determine the reasonably anticipated future use of the site, identify reasonably anticipate future use of groundwater, characterize potential exposure pathways, and evaluate contaminant fate and transport. The assessment will be performed in accordance with the NYSDOH guidance for human health exposure assessment (DER-10, Appendix 3B) and DER-10 section 3.10.1 for fish and wildlife exposure assessment. The data generated from the RI is anticipated to be sufficient to complete the qualitative exposure assessment.

6.0 QUALITY ASSURANCE

Quality assurance protocols and procedures will be implemented in accordance with DER-10, Section 2.3. Laboratory analyses will be performed by Alpha Analytical Laboratory (Alpha), Westborough, MA. Alpha is a NYSDOH-certified laboratory using SW-846 methods and Category B lab deliverables and is certified for analysis of PFAS by modified USEPA Method 537 and 1,4-dioxane by USEPA Method 8260 SIM. QA/QC samples will be collected to assure the quality of data generated during the RI. The following samples will be collected during the RI for quality control purposes:

- Duplicate and Matrix/Matrix Spike Duplicate samples will be collected at a frequency of one (1) per 20 samples.
- Aqueous trip blanks will be collected for samples that are to be analyzed for volatiles at a frequency of one (1) per 20 samples.
- One (1) ambient air sample, and one (1) outdoor air sample will be collected when collecting soil vapor samples in accordance with NYSDOH guidance. Soil vapor reporting limits will be at or below 0.2 mcg/m^3.

Soil samples will be analyzed with detection limits that meet, or are less than, the Part 375 Appendix 5 Unrestricted Use SCOs. Groundwater samples will be analyzed with detection limits that meet, or are less than, the New York State Groundwater Quality Standards. Soil vapor and air samples will be analyzed with detection limits that meet, or are less than, the detection limits specified in NYSDOH guidance manual for vapor intrusion (i.e. 0.2 micrograms per cubic meter).

When collecting samples to be analyzed for PFAS, the sampler will wear nitrile gloves while filling and sealing sample bottles, and loose paper, ballpoint pens, and metal clipboards will be used for documentation purposes. Cosmetics, sunscreen, insect repellent and other products or clothing that are known to contain PFAS will not be worn by field staff to avoid sample contamination. Sampling equipment components and sample containers will not come in contact with aluminum foil, low density polyethylene (LDPE), glass or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A field blank sample will be collected each day that groundwater or soil samples are collected and analyzed for PFAS as a quality control measure to evaluate whether PFAS are being introduced from equipment, environmental sources, or the laboratory. Sample containers will be HDPE or polypropylene. Sample container caps will be unlined and made of HDPE or polypropylene (no Teflon®-lined caps). The guidelines listed below for field equipment used for PFAS-related sampling will be followed.

- Equipment must not contain Teflon® (aka PTFE) or LDPE materials;
- Sampling materials made from stainless steel, HDPE, acetate, silicon, or polypropylene are acceptable;
- No waterproof field books will be used;
- No plastic clipboards, binders, or spiral hard cover notebooks will be used;
- No adhesives (i.e. Post-It® Notes) will be used;
- Sharpies and permanent markers are not acceptable; regular ball point pens are acceptable;
- Aluminum foil will not be used;
- Samples for PFAS analysis will be kept away from sampling containers that may contain PFAS;
- Samples will be cooled using regular ice only; chemical (blue) ice packs will not be used.

A qualified third-party will review the analytical data package and all associated laboratory QA/QC information to assess analytical quality and the usability of the data. The assessment will determine whether:

- The data package is complete;
- Holding times have been met;
- The Quality Control (QC) data fall within the protocol limits and specifications;
- The data have been generated using established and agreed upon analytical protocols;
- The raw data confirm the results provided in the data summary sheets and QC verification forms; and
- Correct data qualifiers have been applied.

A Data Usability Summary Report (DUSR) will be prepared in accordance with Appendix 2B, "Guidance for the Development of DUSRs" of DER-10. The DUSR will be prepared by a qualified third party that is independent from the firm that obtained the samples and is independent from the laboratory performing the analysis. The DUSR will determine whether the analytical data for all samples, as presented, meets the project's criteria for data quality and data use, and will be submitted for regulatory review and approval. Specific conclusions and recommendations will be provided. The DUSRs will be included in the RI Report submitted to the NYSDEC.

Laboratory analytical data generated during the RI will be submitted in NYSDEC's Electronic Data Deliverable (EDD) format, using the software application EQuIS, following receipt from the laboratory.

7.0 HEALTH AND SAFTEY PLAN AND CAMP

A Health and Safety Plan (HASP) for this Site is included as Appendix B. A copy of the HASP will be available at the Site during the investigation and remediation activities.

A Generic CAMP is provided in Appendix C and will be implemented during ground intrusive activities both inside and outside of the onsite building or in affected offsite areas. Site controls will be implemented during investigation activities to avoid ground intrusive or soil handling activities within 20

feet of an occupied structure or potential receptors, to the extent possible; however, in accordance with the Generic CAMP, special requirements for the CAMP will be developed in conjunction with the NYSDOH and NYSDEC if any ground intrusive or soil handling activities are planned that will occur within 20 feet of an occupied structure or potential receptors.

8.0 REPORTING AND SCHEDULE

8.1 Reporting

A RI Report will be prepared to present the results of the tasks described herein. The report will describe the methods used to perform the investigation and will present the results in summary tables and maps, as appropriate. The report will include summaries of the previous investigations and supporting laboratory reports of sample analyses.

The RI Report will be submitted to the NYSDEC in electronic (pdf) format and hard copy. All generated data will be submitted in NYSDEC's EDD format, using the software application EQuIS.

Monthly progress reports will be submitted to the NYSDEC in accordance with the Brownfield Cleanup Agreement beginning the 10th of the month following approval of this work plan. The progress report will provide the following information for the reporting period (i.e., the previous month):

- a description of the work completed during the reporting period,
- a description of work anticipated for the next reporting period,
- approved modifications to the work scope or schedule,
- results of sampling and testing,
- types and quantities of waste removed from the Site,
- estimated project percent complete,
- unresolved delays, or expected delays, and
- activities undertaken in relation to the Citizen's Participation Plan.

8.2 Schedule

STERLING will notify the NYSDEC at least seven (7) calendar days prior to initiating any RI field activities. Changes to the RI Work Plan activities due to field conditions or other circumstances will be approved by NYSDEC and documented in the monthly progress reports. The tasks and schedule anticipated to complete the RI and subsequent program documents/requirements is provided in Appendix D.

9.0 CITIZENS PARTICIPATION

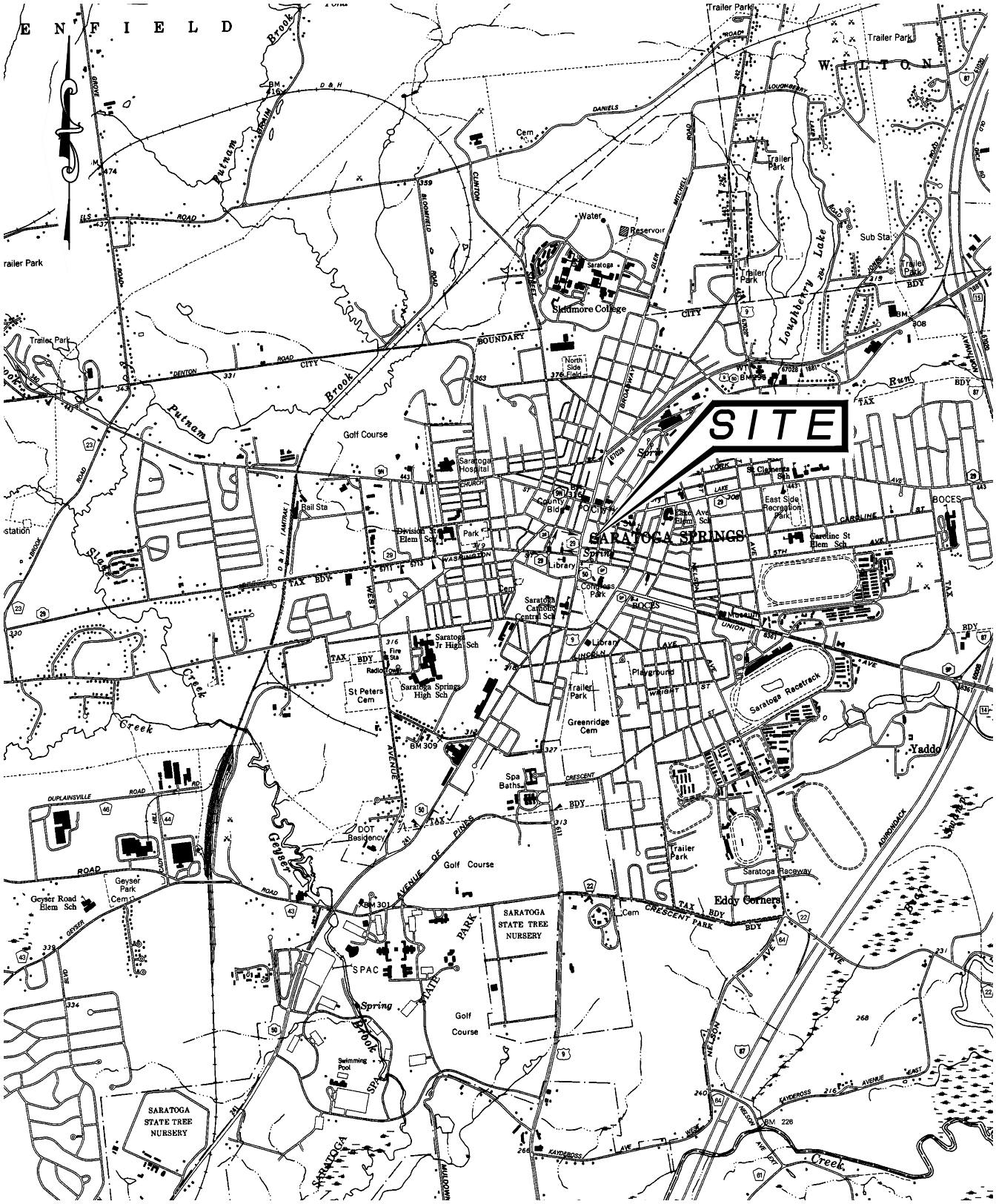
Citizen participation is an integral part of the Brownfield Cleanup Program and citizen's participation activities are incorporated into the schedule provided in Appendix D. These activities include mailing a fact sheet to the site contact list and/or publishing notices for the following:

- Remedial Investigation Work Plan approval and subsequent public comment period,
- Results of the Remedial Investigation,
- Remedial Work Plan approval and subsequent public comment period,

- Schedule and implementation of Remedial Measures,
- Final Engineering Report and Site Management Plan approval; and
- Issuance of the Certificate of Completion.

S:\Sterling\Projects\2015 Projects\First Fairfield - 2015-30\Reports and Work Plans\RI Work Plan\2018-10-18 RI Work Plan.doc

FIGURES



MAP REFERENCE: NYSDOT SARATOGA SPRINGS QUADRANGLE

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STERLING

Sterling Environmental Engineering, P.C.

24 Wade Road ♦ Latham, New York 12110

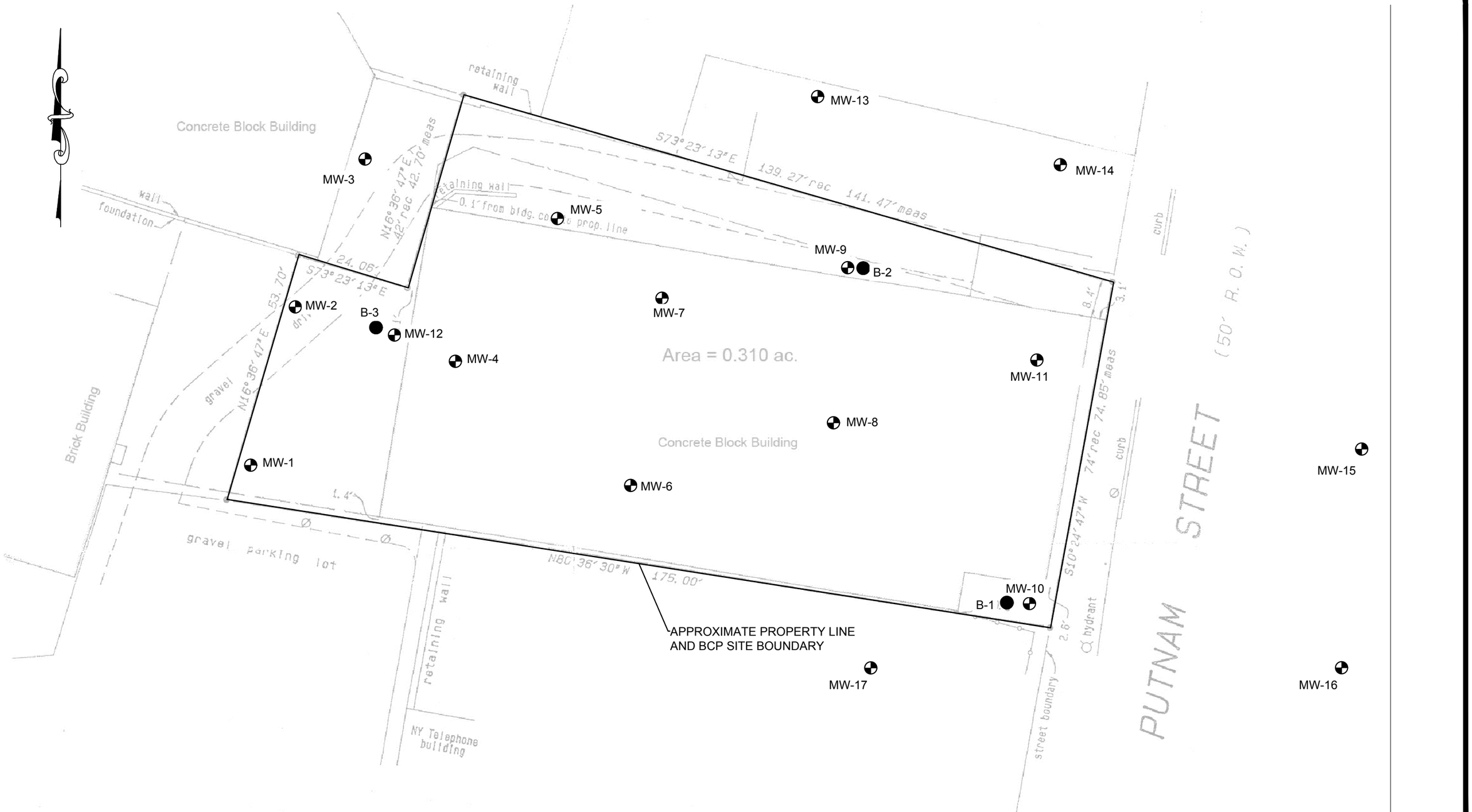
SITE LOCATION MAP

PUTNAM RESOURCES, LLC

53 PUTNAM STREET

CITY OF SARATOGA SPRINGS SARATOGA COUNTY, N.Y.

PROJ. No.: 2015-30	DATE: 01/18/2016	SCALE: 1" = 1000'	DWG. NO. 2015-30016	FIGURE 1



LEGEND:

- MONITORING WELL LOCATION
- GEOTECHNICAL SOIL BORING APPROXIMATE LOCATION

0 20 40

SCALE: 1" = 20'

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STERLING

Sterling Environmental Engineering, P.C.

24 Wade Road ♦ Latham, New York 12110

SITE MAP AND
WELL LOCATIONS

PUTNAM RESOURCES, LLC

53 PUTNAM STREET

CITY OF SARATOGA SPRINGS SARATOGA CO., N.Y.

PROJ. No.: 2015–30	DATE: 04/27/2018	SCALE: 1" = 20'	DWG. NO. 2015–30010	FIGURE 2

LEGEND:

PROPOSED SOIL BORING AND VAPOR PROBE LOCATION

0 20 40

SCALE: 1" = 20'

STERLING

Sterling Environmental Engineering, P.C.

24 Wade Road ♦ Latham, New York 12110

MAP OF LOCATIONS OF PROPOSED
RI SOIL BORING/ SOIL VAPOR PROBES
PUTNAM RESOURCES, LLC
53 PUTNAM STREET

CITY OF SARATOGA SPRINGS SARATOGA CO., N.Y.

PROJ. No.: 2015–30	DATE: 09/14/2018	SCALE: 1" = 20'	DWG. NO. 2015–30036	FIGURE 3

S:\Sterling\Projects\2015 Projects\First Fairfield - 2015-30\ACAD\2015-30036_F-3 - Proposed Boring and Vapor Point Location Map.dwg SWEETT 9/17/2018 10:26 AM

APPENDIX A

DENTE GEOTECHNICAL REPORT

DENTE

ENGINEERING

DENTE
ENGINEERING

ALBANY AREA
594 Broadway
Watervliet, NY 12189
Voice 518-266-0310
Fax 518-266-9238

BUFFALO AREA
PO Box 482
Orchard Park, NY 14127
Voice 716-649-9474
Fax 716-648-3521

GEOTECHNICAL REPORT FOR PROPOSED PARKING GARAGE & BANQUET FACILITY SARATOGA SPRINGS, NEW YORK FILE NO. FDE-04-150

PREPARED FOR:
Omni Development
40 Beaver Street
Albany, New York 12207

PREPARED BY:

Dente Engineering, P.C.
594 Broadway
Watervliet, New York 12189

September, 2004

DENTE
ENGINEERING

ALBANY AREA
594 Broadway
Watervliet, NY 12189
Voice 518-266-0310
Fax 518-266-9238

BUFFALO AREA
PO Box 482
Orchard Park, NY 14127
Voice 716-649-9474
Fax 716-648-3521

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Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

DENTE ENGINEERING

ALBANY AREA
594 Broadway
Watervliet, NY 12189
Voice 518-266-0310
Fax 518-266-9238

BUFFALO AREA
PO Box 482
Orchard Park, NY 14127
Voice 716-649-9474
Fax 716-648-3521

GEOTECHNICAL REPORT FOR PROPOSED PARKING GARAGE & BANQUET FACILITY SARATOGA SPRINGS, NEW YORK FILE NO. FDE-04-150

I. INTRODUCTION

This report presents the results of a Subsurface Investigation and our Geotechnical Evaluation that was completed for a garage and banquet facility building planned for a parcel located at 53 Putnam Street in the City of Saratoga Springs, New York. Our services were authorized by Omni Development Company by accepting our service proposal of July 2 on the 20th, 2004.

In general, our scope of services included:

- The field location and completion of three (3) test borings in the area planned for the building.
- The completion of laboratory tests upon samples of the overburden to allow their classification in engineering terms.
- Evaluation of the results of the field investigation and laboratory tests and the preparation of this Report, which presents our recommendations for the design and construction of the geotechnical aspects of the structures and their associated earthworks and pavements.

This report and the recommendations contained within it were developed for specific application to the site and the construction planned, as we currently understand it. Corrections in our understanding of the project, or changes in the structure location, its grades, loads, etc. should be brought to our attention so that we may evaluate their effects, if any, upon the recommendations offered.

A sheet entitled *"Important Information about your Geotechnical Engineering Report"* prepared by the Association of Engineering Firms Practicing in the Geosciences is presented following the title page of this report. The sheet should be carefully reviewed as it sets the only context within which this report should be used.

II. PROJECT AND SITE DESCRIPTIONS

As we understand it, plans entail the demolition of the existing single story slab on grade masonry walled structure that currently occupies nearly the entire site and developing the parcel with a seven (7) story Garage and Banquet Facility with a plan area of about 10,000 sf, or about the entire lot area. The garage will be an automated system stacking vehicles in trays for storage and retrieval. A shallow, less than 6 feet deep basement, will be required across the entire garage area for the associated mechanical equipment. The Banquet Facility will occupy the top floor. The approximate location of the site is depicted on a portion of the 7.5' USGS Topographic Map of the Saratoga Springs Quadrangle presented on the following page. The map is presented to assist the reader in locating the site and reviewing the topography of the general area in which it exists.

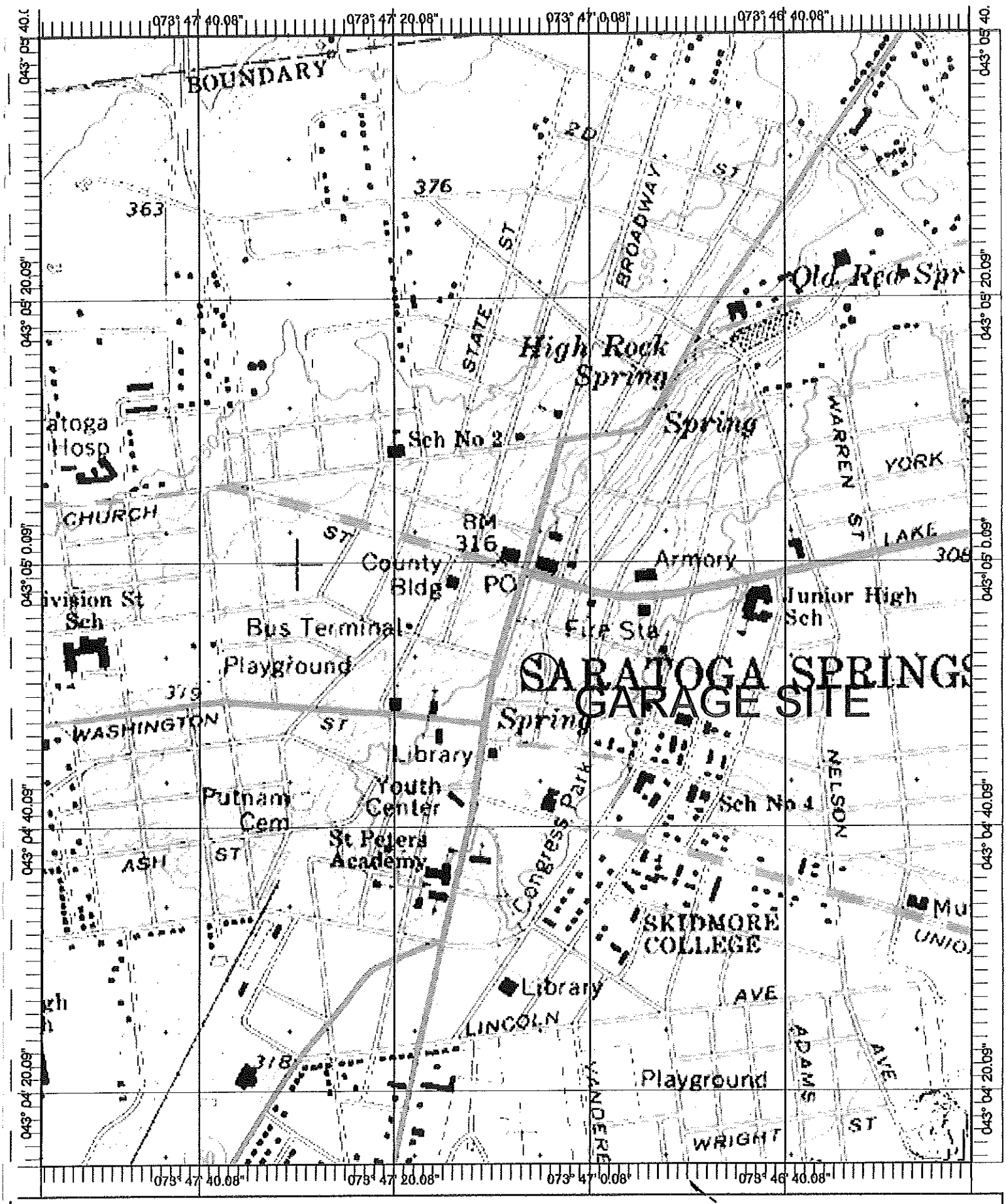
The site lies within a fully developed section of the City, where grades generally slope down from south to north and west to east. Ground levels at the lot currently exist at about elevation 260 feet. Surrounding the lot is a mix of commercial structures of masonry construction that range from two to five stories in height. The majority of the bordering structures appear to have either no, or partial basements. These adjacent buildings appear to have been constructed in the late 1800's through early 1990's. Some of the buildings appear to have suffered localized settlement that has resulted in visible cracking and distortion of the exterior walls. Recent construction in the immediate project area is limited to the Library on the opposite side of Putnam Street, which is supported upon heavily loaded end bearing steel H Piles and the Deck Garage to the south along Putnam, which is supported upon lightly loaded auger cast grout piles.

To facilitate our analyses we have assumed that the new structure will have column loads less than 1,000 kips and wall loads less than 15 kips per lineal foot. We have also assumed that floor loads will be less than 200 psf and that the ground floor will be set less than 6 feet beneath the existing site grades.

III. SUBSURFACE CONDITIONS

The subsurface conditions at the site were investigated through the completion of three exploratory test borings. The exploration locations were staked in the field relative to existing site features by Dente Engineering staff. A Subsurface Investigation Plan is presented in Appendix A, which illustrates the approximate locations of the Test Borings performed for this study.

The test borings were advanced using a CME model 55 rotary drill rig which employed hollow stem augers, flush joint casing and open hole mudded techniques to advance the bores. Overburden soils were sampled and their relative density/comparative consistency determined using split-spoon sampling techniques in general accord with ASTM D-1586 procedures. Subsurface Logs were prepared on the basis of visual classification of the recovered samples by an Engineer. The Subsurface Logs for the Test Borings are presented in Appendix B, together with sheets that explain the terms used in their preparation. Laboratory test results are presented in Appendix C.



Name: SARATOGA SPRINGS
Date: 9/8/104
Scale: 1 inch equals 952 feet

Location: 043° 04' 57.3" N 073° 47' 08.7" W
Caption: BANQUET FACILITY
53 Putnam Street
Saratoga Springs, NY

The Subsurface Logs should be reviewed for a description of the specific conditions disclosed at the locations investigated and the depths sampled. It should be understood that conditions are only known at the locations investigated and at the depths sampled and that conditions at other locations, depths and times may be different. The subsurface conditions are discussed below in order of their occurrence below grade.

Fill soils were encountered, which were likely placed to level the original site grades. These fills were composed of a mixture of native site soils, consisting of fine sand with masonry, construction rubble, coal, ash, cinders, glass, metal, cobbles, and concrete. The fills extended to depths ranging to about 11 feet beneath the ground surface. These fills ranged from loose to firm in relative density.

Although not within the scope of this study, it should be known that petroleum contaminated soils were encountered at location B-3 where a fuel oil storage tank was reportedly removed.

The natural soils encountered beneath the fills were composed of peat and organic silts. The Peat and organics measured between two (2) and four (4) feet thick. Laboratory testing determined the Peat has a moisture content of 100 to 120% with an Organic Content of between about 20 and 30%, classifying them as moderately to highly compressible.

Underlying the peat was a Fine Sand to Fine to Coarse textured Sand with trace, less than 10% by weight, silt. These soils were brown grading to gray, saturated and loose throughout their depths, which ranged between about 25 and 30 feet below the ground surface at the northern and western site limits. The soils were classified as SM-SP deposits in the Unified System.

Underlying the granular soils at locations B-2 and B-3 and the peat at B-1 were varved silt and clay soils of a soft to very soft consistency. Laboratory testing indicated that these soils were preconsolidated, i.e., they have experienced loads greater than the existing overburden loads in their geologic past and, as a result, have consolidated correspondingly. The testing determined their preconsolidation pressure ranges between about 2 and 3 tons per square foot.

These cohesive deposits extended to depths of between about 55 and 65 feet below grade, where firm glacial tills composed of silt, clay, sand and gravel were encountered. At location B-2, the boring was extended through the till where bedrock was apparently encountered at a depth of about 70 feet.

Although the bedrock was not core sampled at this location, Bedrock mapping by the NYS Education Dept. and our studies at immediately adjacent sites have classified the rock as hard, massive Dolomitic Limestone. These studies also determined that core recoveries ranged from about 40 to 100% with increasing depth and Core Quality to be between about 20 and 100%.

Because drilling mud was used to stabilize many of the boreholes, groundwater levels could not be obtained within all of the test borings. As such, a groundwater monitoring well was installed at location B-3. The groundwater measurements, along with the soil moisture and consistencies, suggest that groundwater existed at depths of between about 8 and 9 feet below grade at the time of this study.

The following sections of this report present our recommendations concerning the geotechnical design and construction aspects of the project, as currently planned.

IV. GEOTECHNICAL EVALUATION
A. GENERAL

Our investigation and analyses indicate that the site now planned for this development possesses some geotechnical concerns. These concerns include;

- Groundwater was found to exist across the site between depths of about 8 and 9 feet at the time of this study and will vary little over the seasons.
- Compressible Peat deposits were found within the site limits.

Our evaluation concluded that general liquefaction of the granular soils within the building area should not occur during the design seismic event of the magnitude projected for the project area. The analysis, however, indicates that volumetric strain of the sands caused by the ground shaking may cause overlying shallow spread foundations to settle as much as three (3) inches. These potential settlements are considered unacceptable.

While the potential consolidation of the granular soils during the design seismic event can be modified and lessened by increasing the density of the existing granular deposits in place, only some of these methods are suited to displacing and, as a result, strengthening the peat deposits. These methods, however, may not be well suited for this site because of the proximity of adjacent structures. Considering the site size and the column and wall loads expected for the structures now planned for the site, it is our opinion deep foundations transmitting their loads to the glacial till/bedrock should be planned and used at the site. Of the available foundations, drilled micro piles are recommended for use as they will entail the least risk to adjacent structures at the most efficient design loads.

We recommend that the buildings be sited so that their floor grades are about two (2) feet or more above the groundwater level to avoid, or at least minimize, site dewatering. The perimeter of the structure should be encircled with a foundation level drain.

Because the building's floor slab will overlie uncontrolled fills and peat, they may settle differentially over time. We expect that total and differential settlements, provided grade increases and net slab loads are less than 200 pounds per square foot in total, should be less than about one (1) inch. If these settlements are unacceptable, the slabs may also be supported upon the pile foundation system.

B. SEISMIC CONSIDERATIONS

Site Classification: We have evaluated the site conditions in accordance with Table 1615.1.1 of the Building Code of New York State (Code) and recommend that Seismic Site Class "E" be used for seismic design purposes.

Seismic Design Category: Following the general procedures specified in Section 1615.1 of the Code, the design spectral response acceleration parameters for the site are S_{DS} = 0.35 and S_{D1} = 0.22. Using these general design parameters, Seismic Design Category "D" is required for the project per Tables 1616.3(1) and (2) of the Building Code. This assumes that the project is defined as Seismic Use Group I or II. As required by Section 1802.2.6 of the Code for Seismic Design Category "D", we evaluated specific potential hazards resulting from earthquake motions as detailed below.

Liquefaction: Based on the groundwater conditions and soil composition/density, it is our opinion that the potential for liquefaction of the soils during an earthquake is low. Accordingly, no special design considerations are required to address liquefaction.

Slope Instability: Considering the distance from the site to the top of slope, our analysis concludes that there is minimal potential that slope instability during a seismic event will impact the building addition.

Surface Rupture: There are no known active faults in the project area. On this basis, it is our opinion that there is minimal potential for surface rupture to occur at the site due to faulting. The potential for surface rupture due to lateral spreading is also considered to be low due to the composition of the subgrade soils.

It will likely be advantageous to perform a supplemental site investigation to determine the actual seismic shear wave velocity in the overburden at the site. The actual shear wave velocities are determined through seismic cone penetrometer testing at several site locations throughout the overburden depth. The costs for this study at the site may range between about $6,000 and $7,000 and should be weighed against the potential cost savings in the structural design that could be gained by a D site class.

The following sections present a general discussion of the site development and foundation design recommendations. As the project design progresses, we recommend that we be retained to complete our evaluation of the design option eventually selected and develop a performance based specification.

C. SITE DEVELOPMENT DESIGN

Excavation and Dewatering

Site development should commence with the removal of the existing building, its slabs and foundations, all pavements, surficial vegetation, topsoil, trees, soft soils and organic rich fills from the planned building area. Where required, the contractor should implement dewatering measures to maintain the water level at least two feet below the excavation level and allow work required to remove fills to continue in the dry.

Excavations at this site should be performed in accord with the provisions of OSHA 29 CFR Part 1926 for Type C soils, with 1½H:1V maximum slopes. All excavations at this site should be completed so as not to undermine the adjacent utilities. In general, excavations should not encroach within an existing foundation or utilities' zone of influence defined by a line extending out and down from the existing foundation, grade beam or utility at an inclination of 1-½ Horizontal:1 Vertical. Excavations that encroach within this zone should be sheeted, shored and/or braced to support the soil and adjacent structure loads, or the foundation or utility should be underpinned to establish it's bearing at a deeper level.

We expect the water table to exist between 8 to 9 feet beneath the current ground surface. In our opinion, local depression of the groundwater surface of a foot or so may be accomplished with common local sump and pump and well point techniques.

Excavations that penetrate deeper below the groundwater level, or where it must be depressed over larger areas, may require closely spaced well points to adequately lower the water level and prevent the excavation subgrades from becoming unstable. The well points, if required, should be installed with a graded sandpack to limit the removal of fines that could cause ground subsidence. If the system is found to be drawing excessive fines, the points should be individually shut down and reinstalled as required. The actual means and methods to complete the dewatering, however, should be left to the Contractor. Dewatering must be continuous to maintain the water table a minimum of two feet below the current excavation level.

The building areas should be proofrolled using a self-propelled, smooth drum compactor with a static weight of ten (10) tons to improve their density and uniformity. The proof compacting should be completed through at least five (5) overlapping passes with the compactor operating in its static mode.

Temporary Earth Support

It is recommended that the design of any required temporary earth support at the site be performed by the Contractor's Professional Engineer and submitted for review. The submittal should include assumptions made regarding soil properties, geometry of the excavation, lateral pressure diagrams, locations and magnitudes of all surcharge loads and wall design calculations, including deflection analyses and a proposed monitoring program for the construction period. The temporary earth support should be designed and stamped by the Professional Engineer licensed in the State of New York. Each component of the excavation support system should be designed to support the maximum combination of loading that can occur.

Backfilling and Site Grading

The existing fill soils are considered unsuitable for reuse as a structural fill. Structural fill material should consist of off site borrow composed of any well graded Sand and Gravel or Crushed Rock that meets the gradation criteria of NYSDOT Standard Specifications, Construction and Materials, Section 304, for Type 1, 3 or 4 Materials.

All structural fills to be placed must be graded and sloped to promote their surface drainage, as should the indigenous soils in areas to receive fill. We caution that the more

silty portions of the site soils will be sensitive to slight moisture variations which will adversely affect their workability. Soils that become saturated and unworkable should be removed and wasted.

All structural fill placed at this site, whether imported or excavated from the site, should be placed in loose layers no more than one (1) foot thick with each layer compacted to an in-place density no less than 95 percent of the material's maximum dry density, as determined through the Modified Proctor Compaction Test, ASTM D-1557. All filled grades should be sloped throughout the construction period to assure their drainage.

D. MICRO PILE FOUNDATIONS

It is recommended that, if micro piles are selected, additional test borings be advanced at the site and the rock cored to finalize the allowable capacity and length recommendations provided subsequently. The estimated average cost per foot of pile could also vary depending on the number of piles designed.

We believe that new building foundations at this site can be supported with micro piles, designed to develop their capacity through shear within the indigenous soils and bedrock. The piles should be designed and constructed with at least an eight inch diameter. The piles should be permanently cased through the fill soils, uncased within the bond zone and reinforced as necessary.

The allowable geotechnical capacity of different micro pile diameters and socket lengths have been evaluated and are presented in the table below. We can evaluate other pile diameters and different socket lengths at your request. All pile design capacities should be reviewed by the Geotechnical Engineer prior to final design.

MICRO PILE ROCK SOCKET LENGTH (ft.)	PILE DIAMETER vs AXIAL COMPRESSIVE CAPACITY	
	8"	10"
5	75 kips	90 kips
10	160 kips	200 kips

Notes:

1. Piles assumed to develop their entire capacity within the bedrock.
2. It is recommended that a pile load test be performed in accordance with ASTM D-1143 following the Quick Load Test Procedure.

Uplift capacity can be calculated as 50% of the allowable compression load to account for an increased Factor of Safety.

Based on recent conversations with micro pile installation contractors, the average per foot cost is expected to be in the range of $70 to $90. The actual cost will depend on the actual diameter and length of pile selected. An additional charge will also be required for the

contractor's mobilization and demobilization of equipment and the performance of a pile load test.

To prevent potential disturbance to the setting grout during construction, no pile installation should be permitted within ten feet of a newly installed pile that is less than 24 hours old. Piles should be spaced no closer than about three times the selected pile diameter. The piles should be installed in minimum groups of two and all pile caps should be tied together through a grade beam system.

Lateral loading can be accommodated through grade beams. The lateral load capacity of grade beams may be calculated using a net (Passive minus Active) equivalent fluid weight for the backfill equal to 150 pounds per cubic foot. Pile caps and grade beams about the exterior of the structure should be seated at least four feet beneath adjacent exterior grades to afford frost penetration protection. Pile caps and grade beams within the structure, if heated, may bear at any level. All backfill about the caps and beams should consist of the materials placed and compacted as previously recommended.

Piles will settle upon loading with total and differential settlements of less than one (1) and one-half (½) inch, respectively. The pile settlements should occur as loads are imposed and should cease within days at the design loadings recommended.

The installation of micro piles is specialty work which should only be undertaken by experienced specialty contractors with a trained crew and an assembly of appropriate drilling and grouting equipment. The contractor should be prepared to encounter obstructions, including boulders and rubble fill. It is recommended that the specialty contractor selected for this work submit their planned procedure for the installation of the piles to the Owner's Geotechnical Engineer for review.

E. LATERAL EARTH PRESSURES

New foundation walls that retain earth and are restrained against rotation should be designed to resist At Rest lateral soil loads calculated using an Equivalent Fluid Weight of 55 pounds per cubic foot (pcf) for the NYSDOT Type structural fill materials recommended for use as backfill. Adjacent floor and other surcharge loads should be applied to below grade foundation walls as a uniform lateral pressure over the height of wall equal to 0.5 times the vertical surcharge load.

Exterior foundation, pit and retaining walls should be also be designed to resist superimposed effects of the total static lateral soil pressure, excluding any temporary surcharge, plus an earthquake force calculated with the equation $0.034Y_t H^2$, where Y_t is the total unit weight of the supported soil and H is the height of the wall measured between the finished floor in front and behind the wall. Surcharge loads, if applied over extended periods of time, should also be included. The calculated earthquake force should be distributed as an inverse triangle over the height of the wall.

F. FOUNDATION DRAINAGE

Even with the structure floor seated at the depths recommended herein, a foundation drain should be incorporated into the building design to maintain groundwater levels below the slab level. This drainage system should, at a minimum, consist of a perimeter footing drain, with the top of the pipe set as deep as practical beneath the floor slab.

Portions of the structure that may be planned beneath the foundation level drains, such as elevators, stairwells etc. should be waterproofed and designed for the hydrostatic and buoyant forces that will act upon them.

G. FLOOR SLAB DESIGN

Because the building's floor slabs will overlie uncontrolled fills and peat which exist at the site, they may settle differentially over time. We expect that total and differential settlements of the slabs, provided grade increases and slab loads are less than 200 pounds per square foot in total above those which now exist, should be less than about one (1) inch. If these settlements are unacceptable, the slabs may be supported upon the pile foundation system.

If the settlements are acceptable, the existing building's walls and their slabs should be removed and all existing vegetation and topsoils should be stripped from the surface. The grades should then be proof-compacted using a smooth drum compactor with a static weight of at least ten (10) tons. The surface should be compacted with six (6) overlapping passes of the compactor operating in its static mode. Any unstable areas detected during the proof-compacting should be investigated and, where required, the unstable soils should be undercut and the excavation backfilled with structural fill.

If resilient tile floors are planned to be placed upon the ground floor slab, the floor slabs should be cast upon a vapor retarder placed upon a four (4) inch thick stone vapor break layer composed of ASTM C-33 Blend 57 material in accord with current ACI recommendations. The stone vapor break layer should be placed upon a minimum six (6) inch thick layer of structural fill meeting the gradation requirements of NYSDOT Section 304.0 Type 4 material. This Type 4 base material should be compacted to the density requirements recommended previously.

The slabs should be designed following the recommended procedures of the American Concrete Institute or Portland Cement Association using a Modulus of Subgrade Reaction equal to 150 pounds per cubic inch.

H. PAVEMENTS

It should be understood that the following pavement sections were developed to support the expected wheel loads which will the traverse the pavements. These pavement sections and adjacent sidewalks will heave when frost penetrates the subgrades. Where frost heave is to be minimized, such as along doorways, walks, curbs etc., a minimum 12-inch thick layer of clean crushed aggregate, such as NYSDOT Size 1 aggregate, should be placed

beneath the pavements and walks. An underdrain must also be placed within the crushed stone to facilitate its drainage.

Flexible asphaltic concrete pavements are suitable for use at the site. Pavement subgrades should consist of proof-compacted and densified site soils that have been stripped of topsoil and organics, or borrow structural fill placed and compacted as recommended previously. All base course layers and their subgrades should be drained through sloping and crowning of the grades to assure satisfactory performance. All base course materials should be compacted to 95% of the materials dry density determined through the Modified Proctor Compaction Test, ASTM D-1557 criteria.

We are providing two pavement sections for consideration at the sites dependent upon anticipated traffic types:

RECOMMENDED PAVEMENT SECTIONS

MATERIAL SECTION	THICKNESS		NYSDOT ITEM
	AUTO	AUTO/TRUCK	
Wearing Course	1½"	1½"	403.18 Type 6 or 7
Binder Course	2"	3"	403.13 Type 3
Base Course	6"	12"	304.13 Type 2 [1]
Synthetic Fabric	Yes	Yes	Mirafi 500X

1. If NYSDOT Section 304 Type 4 material is substituted, increase base coarse thicknesses by four inches.

Portland cement pavements may be designed to bear upon a 6 inch thick NYSDOT, 304 Type 2 base course following the procedures of the American Concrete Institute or Portland Cement Association. A Modulus of Subgrade Reaction equal to 200 pounds per cubic inch may be used in the design.

I. CONSTRUCTION MONITORING

The importance of detailed and thorough construction observation and quality control testing services is paramount in the development of this site. We recommend continuous inspection of all earthwork related to foundation and floor slabs to assure that the recommendations offered and subsurface conditions on which they are based are as anticipated.

The foundation and slab design recommendations provided in this report are premised on the Geotechnical Engineer being retained to monitor earthwork and bearing grade preparations. It should be understood that the actual subsurface conditions that exist across this site will only be known when the site is excavated. The presence of the

Geotechnical Engineer during the earthwork and foundation construction phases of the project will allow validation of the subsurface conditions assumed to exist for this study and the design recommended in this report.

Monitoring of micro pile foundation installation should also be continuous. It is essential that a Geotechnical Engineer provide continuous monitoring of the test pile installation, performance of pile load tests and interpretation of the test data. Based on the test results, the design criteria provided herein should be reviewed and modified, if necessary. It is also recommended that the installation of the production piles be monitored by a Geotechnical Engineer. We would be pleased to provide these services during construction.

We believe the construction sequence observation and testing services should be provided by the Geotechnical Engineer of record as a consultant to the Owner, Architect or Construction Manager. We do not believe these services should be provided through the general or earthwork contractor.

V. CLOSURE

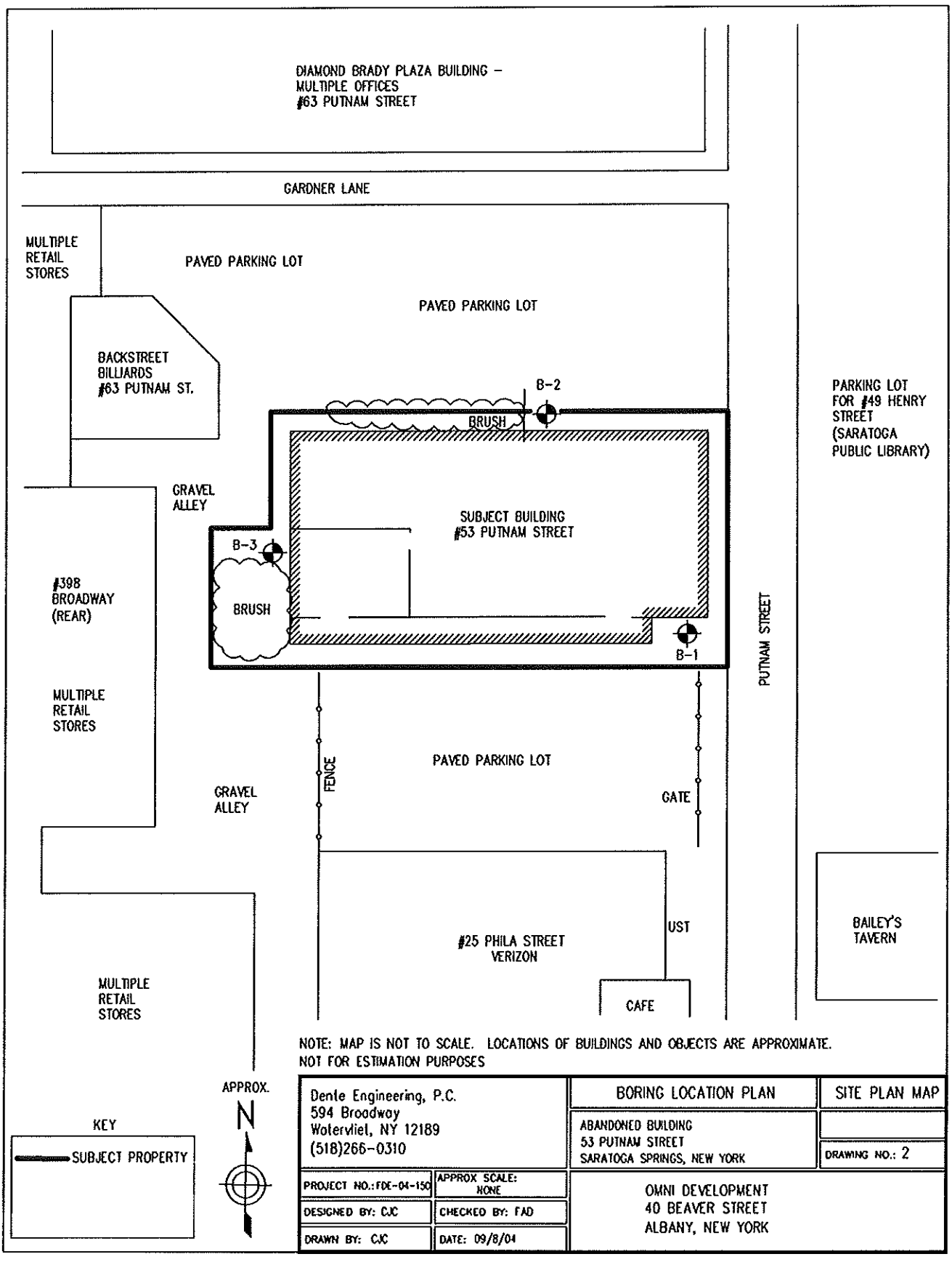
This report was prepared for specific application to the site, project and loadings as discussed herein. It was prepared early in the site design process and, as such, we specifically request the opportunity to review grading plans and building loadings applicable to the report to assure our recommendations have been interpreted as intended. This report was prepared using Geotechnical Engineering methods and practices generally in use at the time of its preparation. No other warranty, expressed or implied, is made.

We appreciate the opportunity to be of service. Should questions arise or if we may be of any other service, please contact us at your convenience.

Yours Truly,
Dente Engineering, P.C.

Fred A. Dente, P.E.
President

APPENDIX A



Dente Engineering, P.C. 594 Broadway Watervliet, NY 12189 (518)266-0310		BORING LOCATION PLAN	SITE PLAN MAP
		ABANDONED BUILDING 53 PUTNAM STREET SARATOGA SPRINGS, NEW YORK	DRAWING NO.: 2
PROJECT NO.: FDE-04-150	APPROX SCALE: NONE	OMNI DEVELOPMENT 40 BEAVER STREET ALBANY, NEW YORK	
DESIGNED BY: CJC	CHECKED BY: FAD		
DRAWN BY: CJC	DATE: 09/8/04		

APPENDIX B

INTERPRETATION OF SUBSURFACE LOGS

The Subsurface Logs present observations and the results of tests performed in the field by the Driller, Technicians, Geologists and Geotechnical Engineers as noted. Soil/Rock Classifications are made visually, unless otherwise noted, on a portion of the materials recovered through the sampling process and may not necessarily be representative of the materials between sampling intervals or locations.

The following defines some of the terms utilized in the preparation of the Subsurface Logs.

SOIL CLASSIFICATIONS

Soil Classifications are visual descriptions on the basis of the Unified Soil Classification ASTM D-2487 and USBR, 1973 with additional comments by weight of constituents by BUHRMASTER. The soil density or consistency is based on the penetration resistance determined by ASTM METHOD D1586. Soil Moisture of the recovered materials is described as DRY, MOIST, WET or SATURATED.

SIZE DESCRIPTION		RELATIVE DENSITY/CONSISTENCY (basis ASTM D1586)			
SOIL TYPE	PARTICLE SIZE	GRANULAR SOIL		COHESIVE SOIL	
BOULDER	> 12	DENSITY	BLOWS/FT.	CONSISTENCY	BLOWS/FT.
COBBLE	3" - 12"	LOOSE	< 10	VERY SOFT	< 3
GRAVEL-COARSE	3" - 3/4"	FIRM	11 - 30	SOFT	4 - 5
GRAVEL - FINE	3/4" - #4	COMPACT	31 - 50	MEDIUM	6 - 15
SAND - COARSE	#4 - #10	VERY COMPACT	50 +	STIFF	16 - 25
SAND - MEDIUM	#10 - #40			HARD	25 +
SAND - FINE	#40 - #200				
SILT/NONPLASTIC	< #200				
CLAY/PLASTIC	< #200				

SOIL STRUCTURE		RELATIVE PROPORTION OF SOIL TYPES	
STRUCTURE	DESCRIPTION	DESCRIPTION	% OF SAMPLE BY WEIGHT
LAYER	6" THICK OR GREATER	AND	35 - 50
SEAM	6" THICK OR LESS	SOME	20 - 35
PARTING	LESS THAN 1/4" THICK	LITTLE	10 - 20
VARVED	UNIFORM HORIZONTAL PARTINGS OR SEAMS	TRACE	LESS THAN 10

Note that the classification of soils or soil like materials is subject to the limitations imposed by the size of the sampler, the size of the sample and its degree of disturbance and moisture.

ROCK CLASSIFICATIONS

Rock Classifications are visual descriptions on the basis of the Driller's, Technician's, Geologist's or Geotechnical Engineer's observations of the coring activity and the recovered samples applying the following classifications.

CLASSIFICATION TERM	DESCRIPTION
VERY HARD	NOT SCRATCHED BY KNIFE
HARD	SCRATCHED WITH DIFFICULTY
MEDIUM HARD	SCRATCHED EASILY
SOFT	SCRATCHED WITH FINGERNAIL
VERY WEATHERED	DISINTEGRATED WITH NUMEROUS SOIL SEAM
WEATHERED	SLIGHT DISINTEGRATION, STAINING, NO SEAMS
SOUND	NO EVIDENCE OF ABOVE
MASSIVE	ROCK LAYER GREATER THAN 36" THICK
THICK BEDDED	ROCK LAYER 12" - 36"
BEDDED	ROCK LAYER 4" - 12"
THIN BEDDED	ROCK LAYER 1" - 4"
LAMINATED	ROCK LAYER LESS THAN 1"
FRACTURES	NATURAL BREAKS AT SOME ANGLE TO BEDS

Core sample recovery is expressed as percent recovered of total sampled. The ROCK QUALITY DESIGNATION (RQD) is the total length of core sample pieces exceeding 4" length divided by the total core sample length for N size cored.

GENERAL

- Soil and Rock classifications are made visually on samples recovered. The presence of Gravel, Cobbles and Boulders will influence sample recovery classification density/consistency determination.
- Groundwater, if encountered, was measured and its depth recorded at the time and under the conditions as noted.
- Topsoil or pavements, if present, were measured and recorded at the time and under the conditions as noted.
- Stratification Lines are approximate boundaries between soil types. These transitions may be gradual or distinct and are approximated.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-1.1

PROJECT: Putnam Street Building	**DATE**	START: 8-10-04	FINISH: 8-10-04
LOCATION: Saratoga Springs, NY	**METHODS:** 4 1/4" HSAC with		
CLIENT: Omni Development	ASTM D 1586		
JOB NUMBER: FDE-04-150	**SURFACE ELEVATION:**		
DRILL TYPE: CME 55	**CLASSIFICATION:** J. Robichaud		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	2				**FILL:** Dark Brown F-M SAND, Little Gravel & Brick, trace silt and cinders
				3	4	5	
5'							
	2	2	2				at 5.5' Grades to Light Brown F-M SAND, Little Coarse Sand & Gravel, trace silt **(WET)**
				2	2	4	
10'							Grades Gray, Some Wood Fragments **(MOIST TO WET, LOOSE)**
	3	7	6				
				5	4	11	
							Black Organic PEAT & ROOTS, trace fine sand
15'							
	4	2	2				Brown / Gray Mottled SILT, trace clay with frequent F-M SAND, Little Silt Partings and Seams
				3	3	5	
20'							
	5	2	3				Grades Brown to Gray SILT & CLAY, Occasionally Varved with Occasional Fine Sand Partings
				4	5	7	
25'							
	6	2	2				Grades Gray SILT & CLAY
				2	2	4	
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-1.2

PROJECT: Putnam Street Building	DATE	START: 8-10-04	FINISH: 8-10-04
LOCATION: Saratoga Springs, NY	METHODS: 4 1/4" HSAC with		
CLIENT: Omni Development	ASTM D 1586		
JOB NUMBER: FDE-04-150	SURFACE ELEVATION:		
DRILL TYPE: CME 55	CLASSIFICATION: J. Robichaud		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	7	2	2				Gray SILT & CLAY
				3	4	5	
35'							
	8	2	2				Grades with Occasional Varves and Fine
				2	2	4	Sand Partings
40'							
	9	2	2				
				2	3	4	
45'							
	10	2	2				Grades Varved
				3	4	5	
50'							
	11	2	2				Grades with Occasional F-M SAND Seams
				3	4	5	
55'							
60'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-1.3

PROJECT: Putnam Street Building	DATE	START: 8-10-04	FINISH: 8-10-04
LOCATION: Saratoga Springs, NY	METHODS: 4 1/4" HSAC with		
CLIENT: Omni Development	ASTM D 1586		
JOB NUMBER: FDE-04-150	SURFACE ELEVATION:		
DRILL TYPE: CME 55	CLASSIFICATION: J. Robichaud		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							Gray Varved SILT & CLAY with Occasional F-M Sand Seams
65'							**(MOIST TO SATURATED, SOFT & MEDIUM)**
							End of boring at 65.5' with probe refusal. Groundwater measured at 44.0 inside augers upon completion and at 41.8' inside augers after 30 minutes. Note: Driller advanced AW probe from 52.0' to refusal at 65.5'.
70'							
75'							
80'							
85'							
90'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-2.1

PROJECT: Putnam Street Building	DATE	START: 8-10-04	FINISH: 8-11-04
LOCATION: Saratoga Springs, NY	METHODS: 4" ⌀ FJ Casing w/ Tricone		
CLIENT: Omni Development	and Mud Rotary ASTM D 1586		
JOB NUMBER: FDE-04-150	SURFACE ELEVATION:		
DRILL TYPE: CME 55	CLASSIFICATION: J. Robichaud		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	ASPHALT ± 2" / CRUSHED STONE ± 4"
	1	------	4				**FILL:** Gray / White / Brown F-M SAND and
				8	7	12	CINDERS, Little Silt, trace gravel
5'							
	2	1	1				Brown F-M SAND, Little Coarse Sand and
				2	2	3	Silt, trace gravel, brick and cinders **(WET)**
							(MOIST TO WET, FIRM TO LOOSE)
10'							
	3	2	2				Dark Brown / Black Organic PEAT & ROOTS,
				3	4	5	trace f-m sand **(WET)**
15'							
	4	2	2				Poor Recovery: Brown / Gray M-C SAND
				4	—	6	and GRAVEL
20'							
	5	3	2				Brown F-M SAND & GRAVEL, Little Coarse
				4	—	6	Sand, trace silt **(SATURATED)**
							Driller Notes: Gravel & Cobbles to ± 24.0'.
25'							**(WET TO SATURATED, LOOSE)**
	6	9	10				Brown Fine SAND & SILT
				15	—	25	
30'							**(SATURATED, FIRM)**

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-2.2

PROJECT: Putnam Street Building	DATE	START: 8-10-04	FINISH: 8-11-04

LOCATION: Saratoga Springs, NY	METHODS: 4" ⌀ FJ Casing w/ Tricone
CLIENT: Omni Development	and Mud Rotary ASTM D 1586
JOB NUMBER: FDE-04-150	SURFACE ELEVATION:
DRILL TYPE: CME 55	CLASSIFICATION: J. Robichaud

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	7	1	3				
				4	—	7	Brown to Gray SILT & CLAY, trace fine sand with fine gravel noted
35'							
	8	WH	WH				Grades Brown / Gray SILT & CLAY
				3	—	3	
40'							
	9	WH	WH				
				WH	—	WH	
45'							
	10	WH	WH				
				WH	—	WH	
50'							
	11	WH	WH				Grades with Occasional Olive colored partings
				WH	—	WH	
55'							
	12	2	3				
				3	—	6	
60'							(SATURATED, MEDIUM TO SOFT)

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-2.3

PROJECT: Putnam Street Building	**DATE**	START: 8-10-04	FINISH: 8-11-04
LOCATION: Saratoga Springs, NY	**METHODS:** 4" ⌀ FJ Casing w/ Tricone		
CLIENT: Omni Development	and Mud Rotary ASTM D 1586		
JOB NUMBER: FDE-04-150	**SURFACE ELEVATION:**		
DRILL TYPE: CME 55	**CLASSIFICATION:** J. Robichaud		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	13	13	38				**TILL:** Gray / Dark Gray F-M SAND & SILT,
				23	—	51	Little Clay, trace gravel
65'							
	14	23	19				Poor Recovery: Grades Some Gravel
				19	—	38	**(SATURATED)**
							Driller Notes: Tricone roller bit very difficult
							at 69.5' depth
70'							**(MOIST TO SATURATED, V. COMPACT TO COMPACT)**
							End of boring at 69.5' depth.
							Note: Driller advanced 4 1/4" HSAC to 5.0'
							and removed after Sample 2. Driller then
75'							advanced 4" ⌀ flush joint casing to 10.0' and
							completed boring with 3 7/8" diameter tricone
							roller bit with drilling mud and open hole
							techniques.
80'							
85'							
90'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-3.1

PROJECT: Putnam Street Building	DATE	START: 8-12-04	FINISH: 8-12-04
LOCATION: Saratoga Springs, NY	METHODS: 4 1/4" HSAC with		
CLIENT: Omni Development	ASTM D 1586		
JOB NUMBER: FDE-04-150	SURFACE ELEVATION:		
DRILL TYPE: CME 55	CLASSIFICATION: J. Robichaud		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	2	2				**FILL:** Tan / Brown F-M SAND
				2	2	4	
5'							
	2	WH	WH				
				WH	2	WH	
10'							
	3	2	3				**(DRY, LOOSE)**
				3	3	6	Dark Brown / Black Organic PEAT & ROOTS
							Brown / Black F-M SAND, Little Silt with
15'							Moderate to Strong Fuel Odor and Significant Black Staining
	4	3	3				Grades **WET**
				4	4	7	
20'							
	5	WR	WH				Grades trace silt **(SATURATED)**
				1	1	1	with a moderate to strong fuel odor.
25'							**(MOIST TO SATURATED, LOOSE)**
	6	3	3				Brown SILT & CLAY
				4	4	7	
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-3.2

PROJECT: Putnam Street Building	**DATE**	START: 8-12-04	FINISH: 8-12-04
LOCATION: Saratoga Springs, NY	**METHODS:** 4 1/4" HSAC with		
CLIENT: Omni Development	ASTM D 1586		
JOB NUMBER: FDE-04-150	**SURFACE ELEVATION:**		
DRILL TYPE: CME 55	**CLASSIFICATION:** J. Robichaud		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	7	WH	WH				Brown / Gray SILT & CLAY
				1	2	1	
35'							
	8	WH	WH				Grades Gray
				WH	2	WH	
40'							
	9	WH	WH				Grades Occasional Fine GRAVEL noted
				WH	—	WH	
							Driller Notes: Gravel Layer from 43.0' - 44.0'
45'							
	10	WH	WH				
				WH	----	WH	
50'							
	11	WH	WH				**(MOIST TO SATURATED, MEDIUM TO V. SOFT)**
				9	—	9	Gray SILT, Some Clay, Little F-M Sand
55'							
	12	5	8				**(SATURATED, FIRM)**
				15	13	23	**TILL:** Gray / Dark Gray SILT, Some F-M Sand and Gravel, Little Clay
60'							

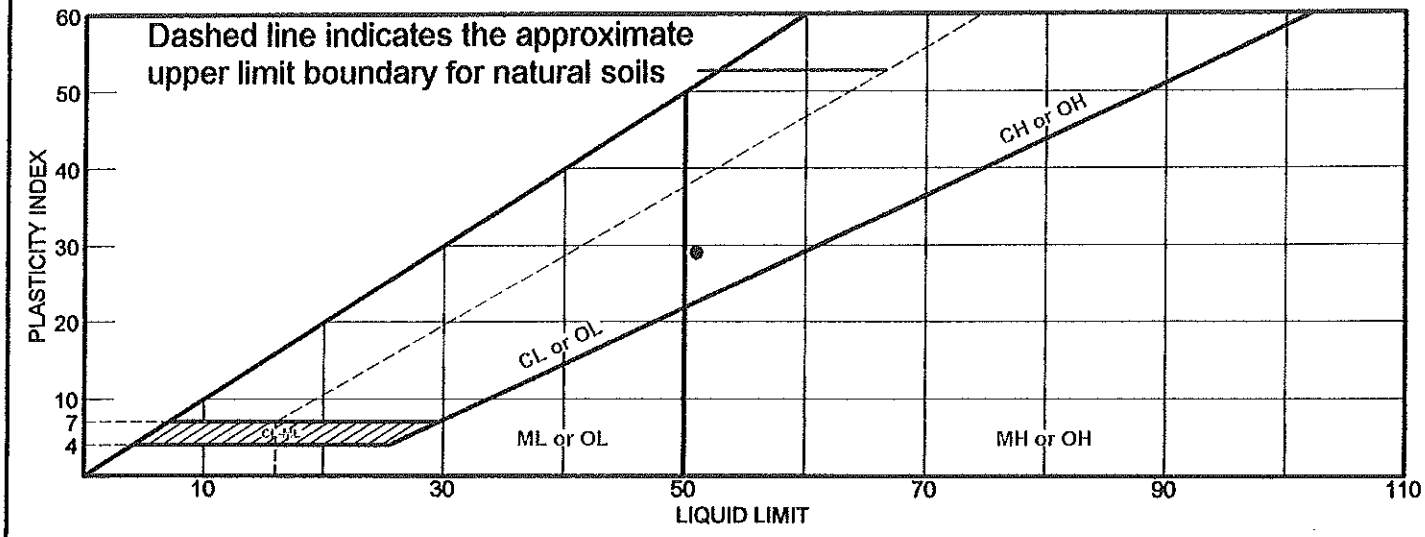
DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-3.3

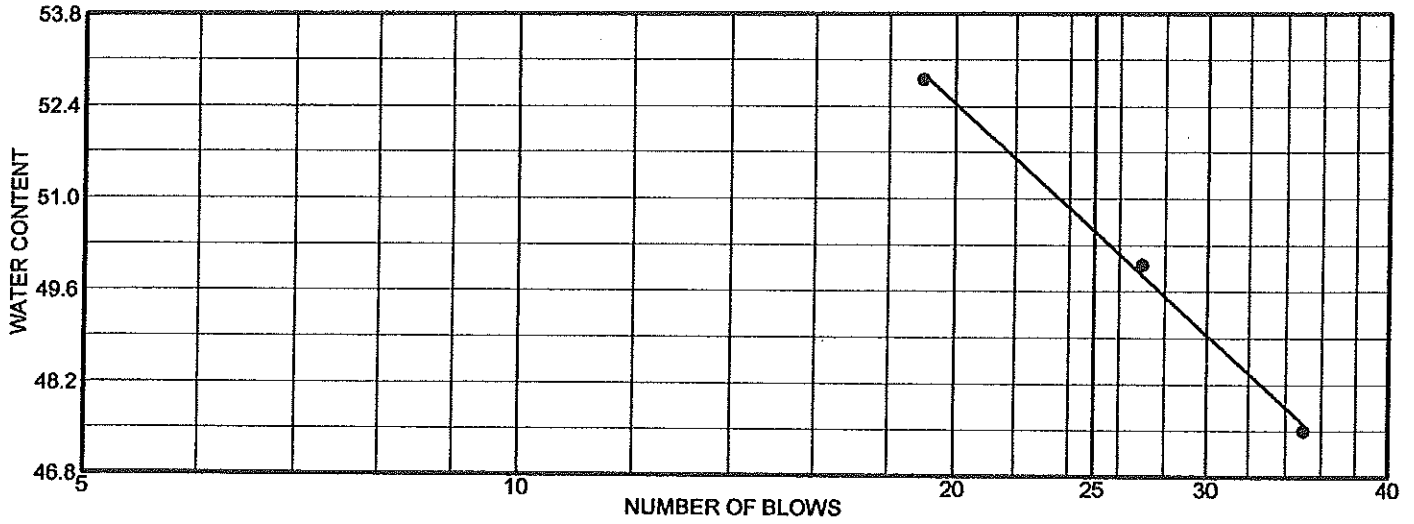
PROJECT: Putnam Street Building	DATE	START: 8-12-04	FINISH: 8-12-04
LOCATION: Saratoga Springs, NY	METHODS: 4 1/4" HSAC with		
CLIENT: Omni Development	ASTM D 1586		
JOB NUMBER: FDE-04-150	SURFACE ELEVATION:		
DRILL TYPE: CME 55	CLASSIFICATION: J. Robichaud		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	13	2	12				TILL: Gray / Dark Gray SILT, Some Clay,
				11	26	23	Little F-M Sand, trace gravel
65'							
	14	50	1				Grades SILT & F-M SAND, Some Gravel,
				20	15	37	Little Clay
							(SATURATED, FIRM TO COMPACT)
70'							End of boring at 67.0' depth.
							Groundwater measured at 13.5' inside augers upon completion.
							Note: Installed 2" ⌀ PVC Well at 19.5' depth. Well includes 10' of # 10 screen and was backfilled with sand pace to 6.0' and clay spoils to grade.
75'							
80'							
85'							
90'							

APPENDIX C

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey Clay Moisture - 38.7%	51	22	29			CH

Project No. FDE 04-150 **Client:** Omni Developement

Project: Putnam St. Building

● **Source:** Borings **Sample No.:** 597 - B1/S7 **Elev./Depth:** 30'-32'

Remarks:

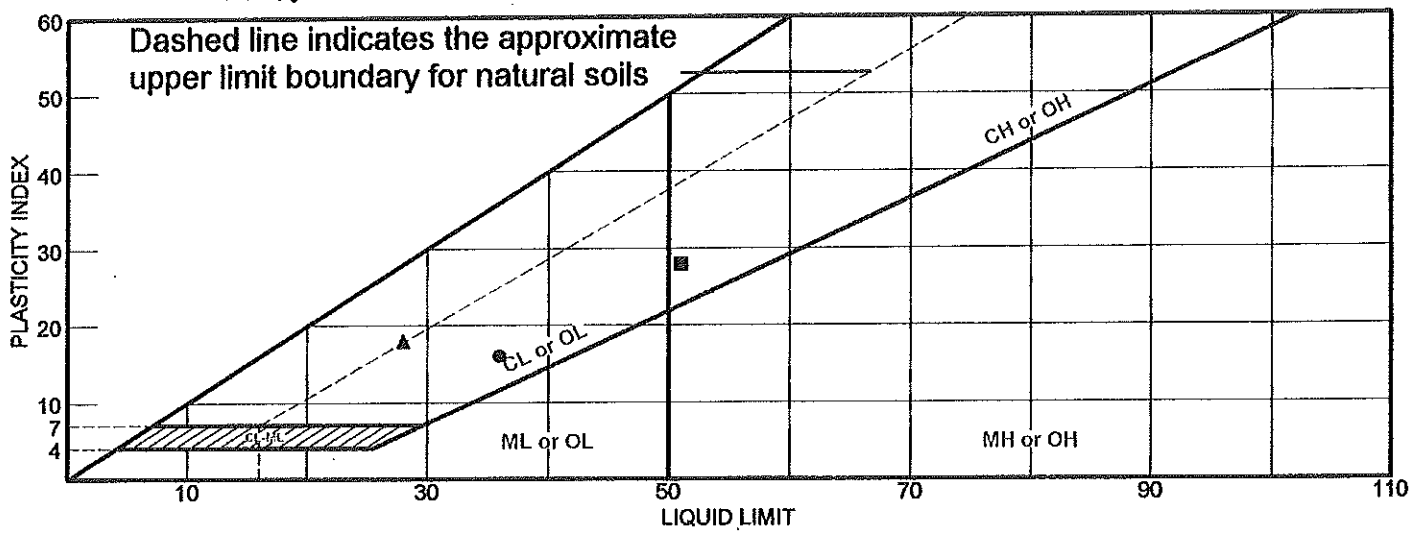
● Tested By: SAR Checked By: FD

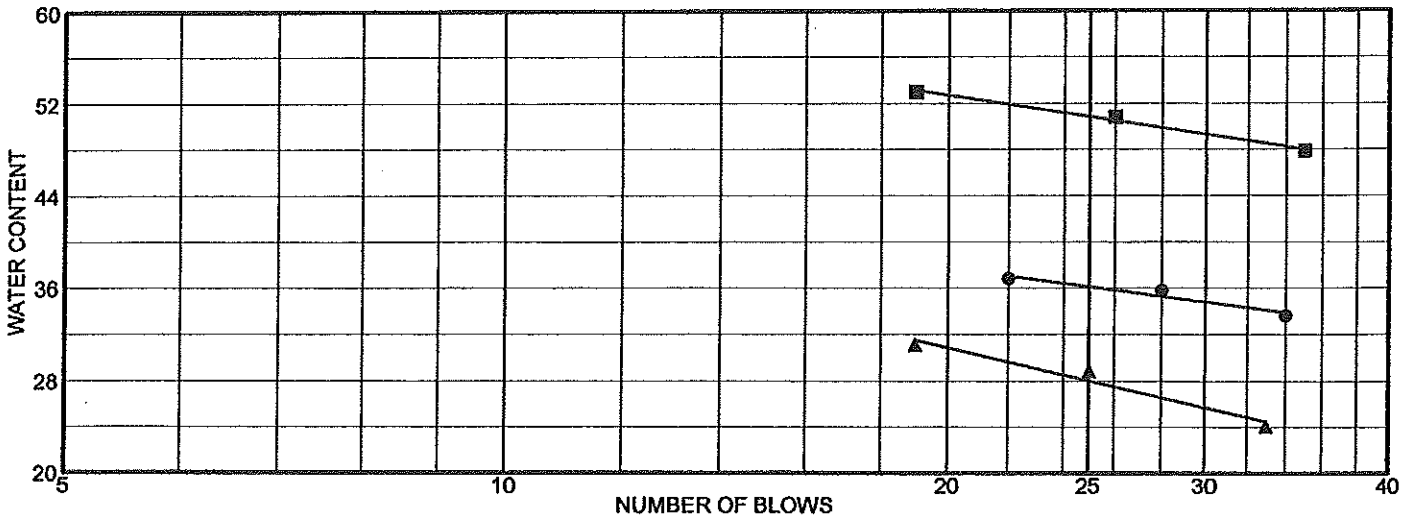
LIQUID AND PLASTIC LIMITS TEST REPORT

EVERGREEN TESTING, INC.

Figure 597

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey Clay Moisture - 29.2%	36	20	16			CL
■	Grey Clay, trace f-Gravel Moisture - 40.3%	51	23	28			CH
▲	Silty clay, little f-Gravel Moisture - 28.2%	28	10	18			CL

Project No. FDE 04-150 **Client:** Omni Developement

Project: Putnam St. Building

● **Source:** Borings **Sample No.:** 598 - B2/S8 **Elev./Depth:** 35'-36.5'

■ **Source:** Borings **Sample No.:** 599 - B2/S10 **Elev./Depth:** 45'-46.5'

▲ **Source:** Borings **Sample No.:** 600 - B2/S12 **Elev./Depth:** 55'-56.5'

Remarks:

● Tested By: SAR Checked By: FD

■ Tested By: SAR Checked By: FD

▲ Tested By: SAR Checked By: FD

LIQUID AND PLASTIC LIMITS TEST REPORT

EVERGREEN TESTING, INC.

Figure 598-600

Putnam St. Building

Moisture Content Results

Boring No.	B-1/S1	B-2/S3	B-2/S5	B-2/S6	B-1/S7	B-2/S8
Sample No.	593	594	595	596	597	598
Sample Depth	10'-12'	10'-12'	20'-21.5'	25'-26.5'	30'-32'	35'-36.5'
Tare Weight	38.67	38.10	189.52	188.44	186.47	80.42
W_S + Tare	85.12	204.67	522.90	418.00	427.10	289.05
W_D + Tare	61.53	114.18	471.90	371.65	359.90	241.89
W_{WATER}	23.59	90.49	51.00	46.35	67.20	47.16
$W_{DRY\ SOIL}$	22.86	76.08	282.38	183.21	173.43	161.47
% Moisture (W_W / W_D)	103.2	118.9	18.1	25.3	38.7	29.2

Boring No.	B-2/S10	B-2/S12				
Sample No.	599	600				
Sample Depth	45'-46.5'	55'-56.5'				
Tare Weight	80.87	82.35				
W_S + Tare	293.13	272.90				
W_D + Tare	232.10	230.99				
W_{WATER}	61.03	41.91	0.00	0.00	0.00	0.00
$W_{DRY\ SOIL}$	151.23	148.64	0.00	0.00	0.00	0.00
% Moisture (W_W / W_D)	40.4	28.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_D + Tare						
W_{WATER}						
$W_{DRY\ SOIL}$						
% Moisture (W_W / W_D)						

DENTE ENGINEERING
594 Broadway
Watervliet, NY 12189
Ph. 518-266-0310
Fax 518-266-9238

Client: Omni Development
File No. FDE-04-150
Date: Sept. 07, 2004

Putnam St. Building

Organic Content Results

Boring No.	B-1/S3	B-2/S3				
Sample No.	593	594				
Sample Depth	10'-12'	10'-12'				
Tare Weight	74.37	70.16				
W_S + Tare	97.34	146.21				
W_a + Tare	91.12	131.09				
Wa/Ws*100=A%	72.92	80.12	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
100-A%=Org.%	27.08	19.88	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_a + Tare						
Wa/Ws*100=A%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
100-A%=Org.%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_a + Tare						
Wa/Ws*100=A%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
100-A%=Org.%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

DENTE ENGINEERING
594 Broadway
Watervliet, NY 12189
Ph. 518-266-0310
Fax 518-266-9238

Client: Omni Developemant
File No. FDE-04-150
Date: Sept. 07, 2004

APPENDIX B

HEALTH AND SAFETY PLAN (HASP)

Sterling Environmental Engineering, P.C.

53 PUTNAM STREET
SARATOGA SPRINGS, NEW YORK

HEALTH AND SAFETY PLAN
(HASP)

Prepared for:

Putnam Resources, LLC
48 Union Avenue, Suite 1A
Saratoga Springs, New York 12866

Prepared by:

Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110

September 13, 2018

"Serving our clients and the environment since 1993"

53 PUTNAM STREET
SARATOGA SPRINGS, NEW YORK

HEALTH AND SAFETY PLAN
(HASP)

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Tables

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1.0 GENERAL INFORMATION

The Health and Safety Plan (HASP) identifies specific measures to be taken to ensure that hazardous substances or conditions do not adversely impact the health and safety of personnel and the general community (public) for site operations. The HASP is intended to identify potential hazards and appropriate precautions as defined by OSHA 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response).

All personnel working on this project must read this HASP, acknowledge understanding of this plan, and abide by its requirements.

In general, personnel are responsible for complying with all regulations and policies applicable to the work they are performing. The Project Manager is authorized to stop work if any personnel/subcontractor fails to adhere to the required health and safety procedures.

In addition to this HASP, each contractor must provide a HASP that addresses minimum training requirements for activities specific to the project and identified potential hazards specific to the project that are not discussed herein.

2.0 DESIGNATION OF RESPONSIBILITIES

Implementing this HASP is the responsibility of the Project Manager. The Project Manager will be designated prior to any site activities and can be the contractor hired for a particular project, or an independent consultant hired by the Owner.

The Project Manager is responsible for:

- Ensuring the availability, use, and proper maintenance of specified personal protective equipment (PPE), decontamination, and other health or safety equipment.
- Maintaining a high level of safety awareness among personnel/subcontractors and communicating pertinent matters to them promptly.
- Ensuring all field activities are performed in a manner consistent with this HASP.
- Monitoring for dangerous conditions during field activities.
- Ensuring proper decontamination of personnel and equipment.
- Coordinating with emergency response personnel and medical support facilities.
- Initiating immediate corrective actions in the event of an emergency or unsafe condition.
- Notifying the New York State Department of Environmental Conservation (NYSDEC) and project owner of any emergency, unsafe condition, problem encountered, or exception to the requirements of this HASP.

- Recommending improved health and safety measures to the NYSDEC.

The Project Manager must be present for all intrusive investigative activities. However, the presence of the Project Manager shall in no way relieve any person or company of its obligations to comply with the requirements of the HASP and all applicable Federal, State and local laws and regulations.

All personnel involved in the project must be familiar with and conform to the safety protocols prescribed in this HASP, and communicate any relevant experience or observations to the Project Manager to ensure that these valuable inputs improve overall safety. Individual project members are the key elements in ensuring health and safety compliance. Every project member is considered responsible for implementing and following this HASP.

3.0 SITE PROPERTY SPECIFIC HEALTH AND SAFETY CONCERNS

3.1 Suspected Contaminant Hazards

Elevated concentrations of contaminants are present above the soil cleanup objectives (SCOs). Documented reports of a leaking underground storage tank (UST) and historical use of the property as a dry cleaners has resulted in the residual soil and groundwater contamination. The following is a list of the substances of concern identified through the investigation of the site and adjacent areas to date.

- VOCs: Benzene, Toluene, Ethylbenzene, Xylene, Methyl-Tert-Butyl-Ether, trans-1,2-Dichloroethene, cis-1,2-Dichloroethene, and Vinyl Chloride
- SVOCs: Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Naphthalene

Although unlikely, unknown or unexpected materials of a hazardous nature may be encountered during ground intrusive activities. No work will be conducted if field observations or field measurements indicate that there is potential uncontrolled exposure to undefined hazards, or that exposures may exceed protection afforded by the requirements in this HASP.

3.2 Airborne Exposure Limits

Unknown or unexpected materials of a hazardous nature may be encountered during ground intrusive activities. No work will be conducted if field measurements or observations indicate that there is potential uncontrolled exposure to undefined hazards, or that exposures may exceed protection afforded by the requirements in this HASP.

Proper ventilation measures will be taken at all times during excavation and any work activities taking place inside the building. If any indoor action levels are exceeded, corrective measures will be taken such as improving ventilation or over suppression measures. If work needs to be stopped due to high action levels, work will be halted and corrective measures will be taken to resume work.

3.3 Personal Protective Equipment (PPE)

Table A-1 provides a summary of potential airborne hazards that may be encountered by workers during ground intrusive and construction activities, action levels and corresponding required actions and the PPE

level required for workers. Specific types of PPE for levels C and D are also provided in the following table.

AIR MONITORING METHODS, ACTION LEVELS, AND PROTECTIVE LEVELS FOR PERSONNEL

Hazard	Monitoring Unit	Action Level	Protective Levels/Action	Monitoring Schedule
Dust	Particulate Monitor Miniram or Equivalent	<5 mg/m^3 above background in the breathing zone.	Level D-Continue Work	Continuous for ground intrusive activities.
		<5 mg/m^3 above background in the breathing zone.	Level D-Continue Work	
		>10 mg/m^3 above background in the breathing zone.	STOP WORK EVACUATE AREA(1) Implement dust suppression measures	

(1) For all circumstances where work is stopped, the NYSDEC must be notified.

No work is anticipated requiring Levels B or A PPE and very limited or no work in Level C. If air monitoring results require PPE upgrades from Level D, then only medically qualified, trained personnel experienced in the use and limitations of air purifying or supplied air respirators will be used. Air purifying respirators with High-Efficiency Particulate Air (HEPA) filters, capable of removing particles of 0.3 micron or larger from air at 99.97% or greater efficiency, should be used when exposure to dust is a potential risk.

Unless the Project Manager directs otherwise, respirators used for organic vapors or particulates should have cartridges changed after eight (8) hours of use, or at the end of each shift, or when any indication of breakthrough or excessive resistance to breathing is detected. OSHA regulations require a Respiratory Protection Program for companies that require employees to enter areas where respirators are required and such Respiratory Protection Programs must address the requirements for replacement of cartridges.

3.4 Suspected Safety Hazards

Suspected safety hazards include those inherent with the operation of heavy equipment such as drilling rigs or excavators, and proximity to excavations. Inspections to ensure appropriate safety measures are in place and the use of lockout and tagout procedures during maintenance of this equipment will control these inherent hazards. Personal protective equipment (PPE) including hard hats, safety shoes and eye protection will be worn to augment other safety precautions.

Drilling rigs and excavators must not operate closer than thirty (30) feet to any overhead lines, measured directly between any part of the equipment and the lines themselves except where electrical distribution and transmission lines have been de-energized and visibly grounded at the point of work, or where insulating barriers have been erected to prevent physical contact with the lines. If drilling or excavating is required within thirty (30) feet of any overhead lines, a written work plan must be provided by the contractor or other equipment operator that includes special measures designed to mitigate the risks and is in accordance with 29 CFR 1926.550(a)(15). The work plan must be reviewed and approved by written signature by the Project Manager.

Care must be taken to ensure loose clothing does not get tangled in any moving equipment associated with drilling rigs or excavators.

There may be slip or trip hazards associated with rough, slippery or elevated work surfaces.

There is also the possibility of organic vapors being encountered during ground intrusive activities due to the presence of volatile organic compounds (VOCs) in soils and groundwater. The Project Manager will use continuous monitoring instruments that measure total VOCs while each task is being conducted to determine ambient levels of contaminants.

All excavations will be maintained to prevent access by unauthorized persons and will be filled or fenced off by the end of the workday. Absolutely no one will be permitted in the excavations, except the operator of equipment where the operator is always located above ground level. If equipment breaks down within the excavation, the equipment will have to be towed out of the excavation for repair. All subsurface samples will be obtained by operation of the excavating equipment and will be collected from the excavator bucket.

3.5 Excavator and Drill Rig Operations

Excavation will be performed with a track-mounted excavator or backhoe. To conduct soil borings, a hollow-stem auger or direct push drilling rig will be used. Working with or near this equipment poses potential hazards, including being struck by or pinched/caught by equipment, potentially resulting in serious physical bodily harm or inhaling dust from concrete coring.

In particular, the following precautions will be used to reduce the potential for injuries and accidents:

- The inspection of excavator and drill rig brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horn, and other safety devices will be conducted prior to the initial mobilization and checked routinely throughout the project.

- Excavator and drill rig cabs will be kept free of all non-essential items and all loose items will be secured.

- Excavators and drill rigs will be provided with necessary safety equipment, including seat belts.

- Drill rig cables and auger flight connections will be checked for evidence of wear. Frayed or broken cables or defective connections will be replaced immediately.

- Parking brakes will be set before shutting off any heavy equipment or vehicle.

- All employees will be briefed on the potential hazards prior to the start of each excavation or drilling project.

3.6 Adverse Weather

Drilling or excavating is dangerous during electrical storms. All field activity must terminate during thunderstorms. Extreme heat and cold, ice and heavy rain can produce unsafe conditions for drilling work. Such conditions, when present, will be evaluated on a case-by-case basis to determine if work shall terminate.

3.7 Fire and Explosion

Use of gasoline or diesel powered equipment increases the risk of fire and explosion hazards. Contractors will be required to store diesel fuel and gasoline in metal cans with self-closing lids and flash arrestors.

3.8 Requirement to Conduct Utility Mark Out

Prior to the start of any subsurface work, underground utilities and piping that may pose a potential hazard will be identified and located. DigSafely.NewYork or equivalent service will be called and underground utilities will be located and marked. Also, the location of privately owned utility lines will be determined.

In the event a pipe or line is struck, work will stop and the Emergency Action Plan will be implemented (see Section 5.0).

3.9 Confined Space Entry

Confined space entry is not anticipated for excavating and sampling activities. If a project requires confined space entry, a specific HASP will be implemented.

"Confined Space" is defined as a space that:

1. *"is large enough and so configured that an employee can bodily enter and perform assigned work;*
2. *has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and*
3. *is not designed for continuous employee occupancy."*

3.10 Excavation and Sampling Work Zones

One of the basic elements of an effective HASP is the delineation of work zones for each ground intrusive location. The purpose of establishing work zones is to:

- Reduce the accidental spread of hazardous substances by workers or equipment from the contaminated areas to the clean areas;
- Confine work activities to the appropriate areas, thereby minimizing the likelihood of accidental exposures;
- Facilitate the location and evacuation of personnel in case of an emergency; and
- Prevent unauthorized personnel from entering controlled areas.

Although a work site may be divided into as many zones as necessary to ensure minimal employee exposure to hazardous substances, this HASP uses the three (3) most frequently identified zones: the Exclusion Zone, Decontamination Zone, and Support Zone. Movement of personnel and equipment between these zones should be minimized and restricted to specific access control points to minimize the spreading of contamination.

- Exclusion Zone

  During investigative work, the Exclusion Zone is the immediate excavation, test pit, borehole, or other area where contamination is either known or expected to occur and where the greatest potential for exposure exists. The following protective measures will be taken in the Exclusion Zone.

  Unprotected onlookers will be restricted from the excavation location so that they are at least twenty-five (25) feet upwind or fifty (50) feet downwind of excavation or drilling activities.

  Workers conducting activities and sampling in the Exclusion Zone will wear the applicable PPE. The actions to be taken and PPE to be worn in the Exclusion Zone if VOCs are above background levels are described in Section 3.3.

- Decontamination Zone

  During investigative work, a Decontamination Zone will be established at the perimeter of the Exclusion Zone, and will include the personnel, equipment and supplies that are needed to decontaminate equipment. The size will be selected by the Project Manager to conduct the necessary decontamination activities. Personnel and equipment in the Exclusion Zone must pass through this zone before leaving or entering the Support Zone. The necessary decontamination must be completed in this zone and the requirements are described in Section 6.0. This zone should always be established and maintained upwind of the Exclusion Zone.

- Support Zone

  During investigative work, the areas located beyond the Decontamination Zone will be considered the Support Zone. Break areas, operational direction and support facilities will be located in this area. Eating and drinking will be allowed only in the Support Zone.

3.11 Natural Hazards

Work that takes place in the natural environment may be affected by plants and animals that are known to be hazardous to humans. Spiders, bees, wasps, hornets, ticks, poison oak and poison ivy are only some of the hazards that may be encountered. Individuals who may potentially be exposed to these hazards should be made aware of their existence and instructed in their identification. Emergencies resulting from contact with a natural hazard should be handled through the normal medical emergency channels. Individuals who are sensitive or allergic to these types of natural hazards should indicate their susceptibility to the Project Manager.

3.12 Heat and Cold Stress Hazards

If work is to be conducted during the winter, cold stress is a concern to the health and safety of personnel. Because disposable clothing such as Tyvek does not “breathe”, perspiration does not evaporate and the suits can become wet. Wet clothes combined with cold temperatures can lead to hypothermia. If the air temperature is less than 40 degrees Fahrenheit (°F) and a worker’s clothes become wet due to perspiration, the worker must change to dry clothes.

3.13 Signs and Symptoms of Cold Stress

- **Incipient frostbite**: is a mild form of cold stress characterized by sudden blanching or whitening of the skin.

- **Chilblain:** is an inflammation of the hands and feet caused by exposure to cold moisture. It is characterized by a recurrent localized itching, swelling, and painful inflammation of the fingers, toes, or ears. Such a sequence produces severe spasms, accompanied by pain.

- **Second-degree frostbite** is manifested by skin which has a white, waxy appearance and is firm to the touch. Individuals with this condition are generally not aware of its seriousness, because the underlying nerves are frozen and unable to transmit signals to warm the body. Immediate first aid and medical treatment are required.

- **Third-degree frostbite** will appear as blue, blotchy skin. This tissue is cold, pale and solid. Immediate medical attention is required.

- **Hypothermia** develops when body temperature falls below a critical level. In extreme cases, cardiac failure and death may occur. Immediate medical attention is warranted when the following symptoms are observed:

    - Involuntary shivering;
    - Irrational behavior;
    - Slurred speech;
    - Sluggishness; and
    - Loss of consciousness.

3.14 Preventing Cold Related Illness/Injury

- Train personnel to identify the signs and symptoms of cold stress. Require field personnel to wear proper clothing for cold, wet and windy conditions, including layers that can be adjusted to changing weather conditions. It is important to keep hands and feet dry.

- Field personnel working in extremely cold conditions must take frequent short breaks in warm, dry shelters to allow their body temperature to increase. If possible, field work should be scheduled during the warmest part of the day. The buddy system should be used so that personnel can assist each other in recognizing signs of cold stress.

- Drink warm, sweet beverages and avoid drinks with caffeine and alcohol. Eat warm, high-calorie foods.

- Personnel with medical conditions such as diabetes, hypertension or cardiovascular disease or who take certain medications, may be at increased risk for cold stress.

3.15 Treatment of Cold Related Injuries

If cold stress symptoms are evident, the affected person must move into a warm, dry sheltered area and all wet clothing should be removed and replaced with dry clothing. If frostbite is suspected, the affected person should be treated by trained medical personnel.

3.16 Signs and Symptoms of Heat Stress

Wearing PPE also puts a worker at a considerable risk for developing heat stress. This can result in health effects ranging from heat fatigue to serious illness or death. Consequently, regular monitoring, remaining hydrated and other precautions are vital.

- **Heat Rash** may result from continuous exposure to heat and humid air.

- **Heat Cramps** are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:

    - Muscle spasms; and
    - Pain in the hands, feet and abdomen.

- **Heat Exhaustion** occurs from increased stress on various body organs, including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

    - Pale, cool, and moist skin;
    - Heavy sweating; and
    - Dizziness, fainting, and nausea.

- **Heat Stroke** is the most serious form of heat stress. Temperature regulation fails, and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Competent medical help must be obtained. Signs and symptoms are:

    - Red, hot, and unusually dry skin;
    - Lack of or reduced perspiration;
    - Dizziness and confusion;
    - Strong, rapid pulse; and
    - Loss of consciousness.

3.17 Preventing Heat Related Illness/Injury

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or heat exhaustion that person may be predisposed to additional heat injuries. To avoid heat stress, the following steps should be taken:

- Have workers drink sixteen (16) oz. (0.5 liter) of fluid (preferably water or diluted drinks) before beginning work. Urge workers to drink a cup or two every fifteen (15) to twenty (20) minutes, or

at each monitoring break. A total of 1 to 1.6 gallons (four (4) to six (6) liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

- If possible, adjust work schedules to avoid the hottest parts of the day.
- Encourage workers to maintain an optimal level of physical fitness.
- Shelter (air-conditioned, if possible) or shaded areas should be provided to protect personnel during rest periods.
- Train workers to recognize, identify, and treat heat stress.

For workers wearing standard work clothes, recommendations for monitoring and work/rest schedules are those approved by American Conference of Governmental Industrial Hygienists (ACGIH) and National Institute of Occupational Safety and Health (NIOSH). Workers wearing semi-permeable PPE or impermeable PPE should be monitored when the temperature in the work area is above 70°F.

3.18 Noise Hazards

Work that involves the use of heavy equipment such as a drill rig or excavator can expose workers to noise during field activities that can result in noise-induced hearing loss. The Project Manager will monitor the noise exposure and will determine whether noise protection is warranted for each of the workers. The Project Manager will ensure that either ear muffs or disposable foam earplugs are available and are used by the workers in the immediate vicinity of the field operation as required.

3.19 Slip, Trip and Fall Hazards

Ground intrusive locations can contain a number of slip, trip and fall hazards for workers, such as:

- Holes, pits, or ditches
- Excavation faces
- Slippery surfaces
- Steep grades
- Uneven grades
- Snow and ice
- Sharp objects

All workers must be instructed to keep back three (3) feet from the top edge of excavation faces.

Drill auger sections will be stored on the transport vehicle as long as possible to avoid creating a trip hazard. Drill auger sections and other tools will be stored in neat arrangements convenient to the driller, but sufficiently distant from the immediate area around the drill rig to minimize trip hazards.

Workers will be instructed to look for potential safety hazards and immediately inform the Project Manager regarding any new hazards. If the hazard cannot be immediately removed, actions must be taken to warn workers about the hazard.

3.20 Modifications to this Plan

Requirements and guidelines in this HASP are subject to modification by the Project Manager in response to additional information obtained during field work regarding the potential for exposure to hazards.

4.0 MEDICAL SURVEILLANCE PROGRAM

4.1 General

Workers who participate in field activities that meet the following criteria will be included in the Medical Surveillance Program:

- All who may be exposed to hazardous substances or health hazards at or above permissible exposure limits, without regard to the use of respirators, for thirty (30) days or more per year, as required by 1926.65(f)(2)(i-iv).

- All who wear a respirator for thirty (30) days or more every year as required by 1926.62(f)(2)(i-iv).

- All who are injured because of overexposure from an incident involving hazardous substances or health hazards.

4.2 Frequency of Medical Exams

Medical examinations and consultations will be provided on the following schedule to the workers who meet the above listed general qualifications:

- Prior to assignment to a work site, if any of the criteria noted above are anticipated.

- At least once every twelve (12) months, unless the physician believes a longer interval (not greater than two (2) years) is appropriate.

- As soon as possible upon notification that a worker has developed signs or symptoms indicating possible overexposure to hazardous materials.

5.0 EMERGENCY ACTION PLAN

Workers will use the following standard emergency procedures. The Project Manager will be notified of any emergency and be responsible for ensuring that the appropriate procedures are followed and that the Project Manager is notified. A first aid kit, an eye wash unit that can provide a minimum flow rate of 0.4 GPM for fifteen (15) minutes, and a fire extinguisher rated 20A-B-C (or higher) will be readily available to workers. All workers will be trained in use of emergency supplies. Questions regarding procedures and practices described in the HASP should be directed to the Project Manager.

5.1 Notification

Any symptoms of adverse health, regardless of the suspected cause, are to be immediately reported to the Project Manager.

Upon the occurrence of an emergency, including an unplanned chemical release, fire or explosion, workers will be alerted and the area evacuated immediately. The Project Manager will notify the ambulance service, fire department and/or police department, as required. Emergency contact telephone numbers are provided below. Re-entry to the work area will be limited to those required to assist injured workers or for firefighting or spill control. Anyone entering the work area following an emergency incident must wear appropriate protective equipment.

5.2 Emergency Services

Emergency Services	Telephone Number
Saratoga Springs Fire Department	911 or (518) 587-3599
Saratoga Springs Police Department	911 or (518) 584-1800
Ambulance	911
Saratoga Hospital	(518) 587-3222
Poison Control Center	(800) 222-1222
NYSDEC Spills Emergency Response Program	(800) 457-7362

A map showing the preferred route to the hospital with written directions is presented in Figure A-1; and written directions are also included on the map.

The following alarm systems will be utilized to alert workers to evacuate the restricted area:

- Direct Verbal Communication
- Radio Communication or Equivalent
- Portable or Fixed Telephone

The following standard hand signals will also be used as necessary:

Hand Signal	Message
Hand gripping throat	Can't breathe/out of air
Grip co-worker's wrist	Leave area immediately, no debate!
Hands on top of head	Need assistance
Thumbs up	Yes/O.K.
Thumbs down	No/Problem

Upon activation of an alarm, workers will proceed to a designated assembly area. The designated assembly area will be determined on a daily basis by the Project Manager and updated as necessary depending upon work conditions, weather, air monitoring, etc. The location of the designated assembly area will be clearly marked and communicated to employees daily or upon relocation of the area. Workers gathered in the designated assembly area will remain there until their presence has been noted. A tally of workers on the daily restricted area access roster will be made as necessary to ensure all workers have been properly evacuated and accounted for.

Workers may return to the designated work area following authorization by the Project Manager.

5.3 Personal Injury

If anyone within a work area is injured and cannot leave the restricted area without assistance, emergency medical services will be notified (see Section 5.2) and appropriate first aid will be administered by certified Emergency Medical Technicians (EMTs).

5.4 Fire/Explosion

Upon the occurrence of a fire beyond the incipient stage or an explosion anywhere on the worksite property, the fire department will be alerted and all personnel moved to a safe distance from the involved area.

5.5 Equipment Failure

If any equipment fails to operate properly, the Project Manager will determine the effect of this failure on continuing operations. If the failure affects the safety of workers (e.g., failure of monitoring equipment) or prevents completion of the planned tasks, all workers will leave the work area until appropriate corrective actions have been taken.

5.6 Record Keeping

The Project Manager will maintain records of reports concerning occupational injuries and illnesses in accordance with 29 CFR 1904.

6.0 DECONTAMINATION METHODS

6.1 Contamination Prevention Methods

The Project Manager will make all workers aware of the potential for contamination. The following procedures will be established to minimize contact with waste:

- Workers will not walk through areas obvious of contamination;
- Workers will not directly touch potentially hazardous substances;
- Workers will wear gloves when touching soil or waste;
- Workers will wear disposable outer garments where appropriate; and
- Excavated soils will be placed on plastic sheeting and covered with plastic sheeting at the end of the workday.

6.2 Decontamination Methods

All workers, clothing, and equipment leaving designated contaminated areas must be decontaminated. Decontamination of equipment will be the responsibility of the Project Manager.

TABLE

Table A-1
Published Airborne Exposure Limits or Odor Thresholds in Parts Per Million (PPM) in Air for Substances that Exceed Applicable Standards in Soil and Groundwater

Substance	OSHA PEL/STEL/C	NIOSH REL/STEL	ACGIH TLV/STEL	IDLH	Cancer Causing	Range of Odor Thresholds
Groundwater - VOCs:						
Benzene	10/5/25	0.1/1	0.5/2.5	500	Y	1.5
n-Butylbenzene	NA	NA	NA	NA	NA	NA
sec- Butylbenzene	NA	NA	NA	NA	NA	NA
Cis-1,2-Dichloroethene (cis-1,2-DCE)	200/-/-	200/-	200/-	1000	N	19.1
1,1 Dichloroethane	100/-/-	100/-	100/-	3000	N	120
1,2 Dichloroethane	50/-/100	1/2	10/-	50	Y	6-10
Trans 1,2 Dichloroethene	200					
Ethylbenzene	100/-/-	100/125	100/125	800	N	2.3
Isopropylbenzene	50/-/-	50/-	50/-	900	N	
Naphthalene	10/-/-	10/15	10/15	250	N	0.084
N-Propylbenzene	NA	NA	NA	NA	NA	NA
Tetrachloroethene	100/-/200	NA	25/100	150	Y	1
Trichloroethene	100/-/200	25/-	50/100	1000	Y	28
Vinyl Chloride	1/-/5	NA	1/-		Y	3,000

NA = Not Available
Definitions of PEL, REL, STEL, TLV, C and IDLH are provided below:

PEL The Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limit for airborne contaminants as a time-weighted average for an eight (8) hour work shift, as listed in 29 CFR 1910.1000.

REL The National Institute for Occupational Safety and Health's (NIOSH) Recommended Exposure Level for a work shift.

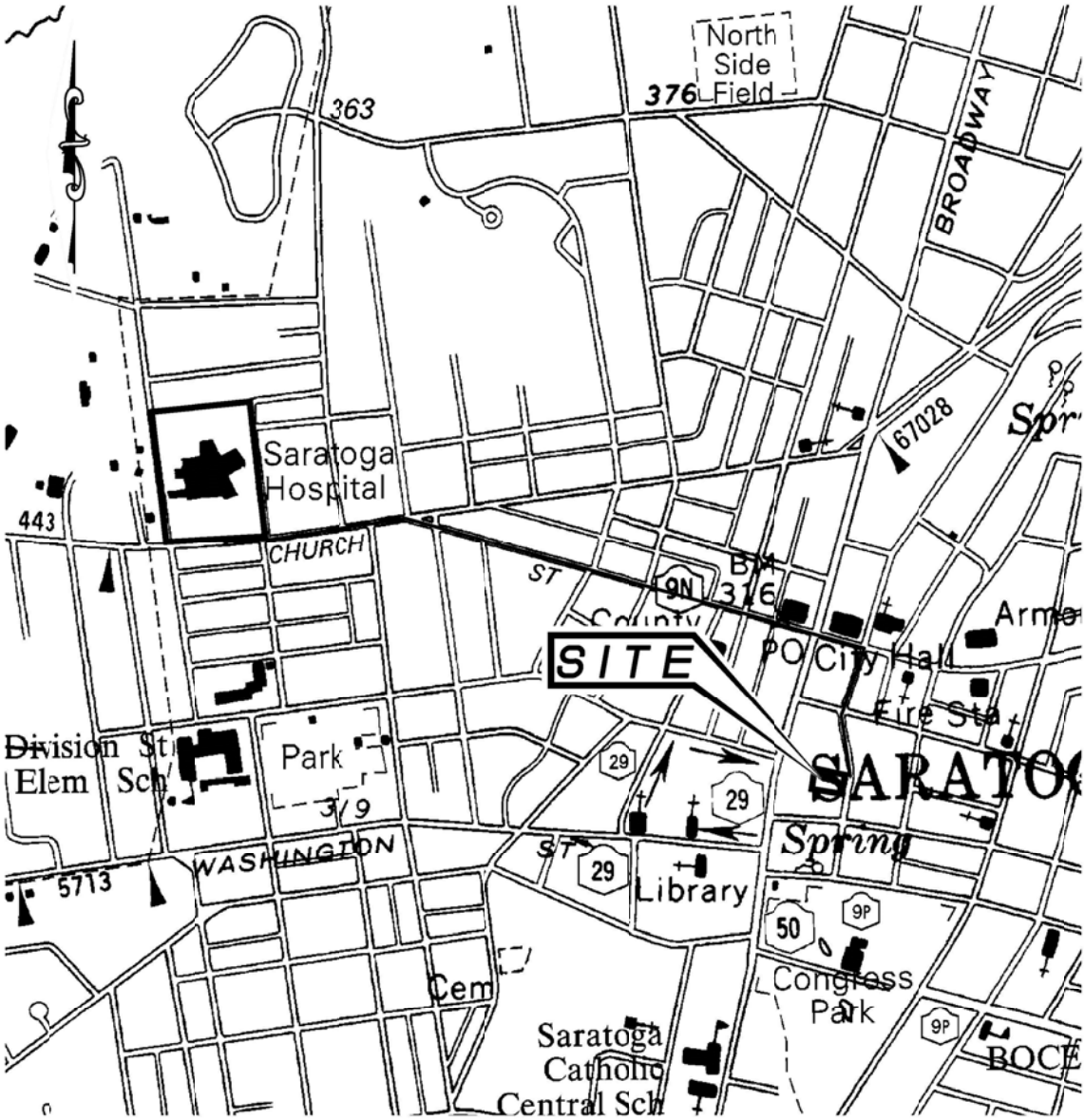
STEL A Short Term Exposure Limit as a 15-minute time-weighted average (No more than four (4) exposures per shift).

TLV The American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit Value for airborne concentrations to which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effects.

C Ceiling Concentration – The concentration that should not be exceeded during any part of the working exposure.

IDLH The Immediately Dangerous to Life and Health maximum concentration from which one could escape within 30 minutes without experiencing any escape–impairing or irreversible health effects. (Note: Level C air-purifying respirators do not adequately protect an individual exposed to these concentrations.) These IDLH values were established by NIOSH and have not been peer reviewed. Caution is recommended with their application.

FIGURE



DIRECTIONS:

1. HEAD NORTH ON PUTNAM ST. – GO 300 FEET
2. CONTINUE (NORTH) ON MAPLE AVE. – GO 350 FEET
3. TURN LEFT (WEST) AT LAKE AVE. – GO 300 FEET
4. CONTINUE (WEST) ON CHURCH ST. – GO 0.6 MILES
5. ARRIVE AT SARATOGA HOSPITAL ON RIGHT

MAP REFERENCE: NYSDOT SARATOGA SPRINGS QUADRANGLE

STERLING
Sterling Environmental Engineering, P.C.
24 Wade Road • Latham, New York 12110

HOSPITAL ROUTE
PUTNAM RESOURCES, LLC
53 PUTNAM STREET
CITY OF SARATOGA SPRINGS SARATOGA COUNTY, N.Y.

PROJ. No.: 2015–30	DATE: 09/21/2017	SCALE: NTS	DWG. NO. 2015–30033	FIGURE A–1

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APPENDIX C

COMMUNITY AIR MONITORING PLAN (CAMP)

NEW YORK STATE BROWNFIELD CLEANUP PROGRAM

53 PUTNAM STREET
SARATOGA SPRINGS, NY
BCP #C546057

COMMUNITY AIR MONITORING PLAN (CAMP)

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared for 53 Putnam Street, Saratoga Springs, NY ("the Site"). The Site is currently in the New York State (NYS) Brownfield Cleanup Program (Site #C546057) which is administered by New York State Department of Environmental Conservation (NYSDEC). This CAMP provides the methods and procedures for real-time air monitoring to be implemented during the disturbance of Site soils relating to construction or remedial activities. This CAMP is to be utilized in coordination with the Health and Safety Plan (HASP) established for the project. Actions and requirements to protect the health and safety of onsite workers from airborne contaminants are addressed in the HASP.

This CAMP provides for real-time air monitoring of particulates at the downwind perimeter of each designated work area when remediation-related ground-intrusive activities, such as excavation or drilling, are implemented at the Site. The CAMP was developed from the New York State Department of Health (NYSDOH) Generic CAMP provided in the DER-10 Technical Guidance for Site Investigation and Remediation. This CAMP provides a measure of protection for the downwind community (potential receptors include residences, businesses, and personnel not directly involved with work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. Contractors should employ Best Management Practices (BMPs) and common sense measures to minimize dust and odors around work areas.

2.0 VOC MONITORING

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified with a photoionization detector (PID). Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate, in accordance with the manufacturer's requirements. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds five (5) parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of five (5) ppm over background but less than 25 ppm, work activities must be

halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below five (5) ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

- All 15-minute readings must be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

3.0 PARTICULATE MONITORING

Monitoring for particulates will be required during remediation-related ground intrusive activities and will include monitoring the upwind and downwind perimeters of the exclusion zone or work area, at a minimum. The particulate monitoring must use real-time monitoring equipment capable of measuring particulate matter less than ten (10) micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level.

As outlined in NYSDEC DER-10 Appendix 1B: Fugitive Dust & Particulate Monitoring, the monitoring equipment must meet, at a minimum, the following performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m^3 (1 to 400,000 :ug/m^3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m^3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50o C (14 to 122o F); and
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

The equipment will be equipped with an audible alarm to indicate exceedance of the action level. The action level is 150 micrograms per cubic meter (ug/m^3) measured as a 15 minutes average. In addition, fugitive dust migration will be visually assessed during all work activities. Calibration will be in accordance with the HASP and the instrument manufacturer's recommendations.

The upwind sampling station will be situated upwind of the largest dust producing activity occurring at the Site at the boundary of the work zone. Similarly, the downwind sampling station will be directly downwind of the largest dust producing activity at the boundary of the work zone.

If the downwind PM-10 particulate level is 100 ug/m^3 greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 ug/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 ug/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ug/m^3 of the upwind level and in preventing visible dust migration.

Should the action level of 150 ug/m^3 continue to be exceeded work must stop and DER must be notified. The notification shall include a description of the control measures implemented to prevent further exceedances. All readings must be recorded and be available for review by the NYSDOH, NYSDEC and Saratoga County Health Department, if requested.

The sampling locations will be periodically adjusted to account for observed changes in wind direction.

4.0 CAMP SPECIAL REQUIREMENTS

4.1 Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative- pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

4.2 Special Requirements for Indoor Work with Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under "Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures" except that in this instance "nearby/occupied structures" would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

5.0 FORMS FOR MONITORING AND RESPONSE

Air monitoring of particulate concentrations will be documented using the air monitoring form provided in Appendix 1. This form is to be completed on a daily basis and records of this form must be made available for NYSDEC and NYSDOH review upon request.

Response action to observed exceedances will be documented using the form provided in Appendix 2. This form must also be made available for NYSDEC and NYSDOH review upon request.

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APPENDIX 1

AIR MONITORING FORM

53 PUTNAM STREET
CITY OF SARATOGA SPRINGS, NEW YORK
BCP #C546057

Air Monitoring Form

Name ______________________ **Weather Conditions** _________________
Date ______________________ **Wind Direction** ____________________

	UPWIND		WORK AREA		DOWNWIND	
Time	**PID**	**DUSTTRAK**	**PID**	**DUSTTRAK**	**PID**	**DUSTTRAK**
	(ppm)	(mg/m^3)	(ppm)	(mg/m^3)	(ppm)	(mg/m^3)

APPENDIX 2

EXCEEDANCES AND ACTIONS TAKEN

53 PUTNAM STREET
CITY OF SARATOGA SPRINGS, NEW YORK
BCP #C546057

Exceedances and Actions Taken

Name _____ **Date** _____

Time _____ **Weather Conditions** _____

Location of Exceedance _____ **Wind Direction** _____

Type of Exceedance:

_____

_____

_____

_____

_____

_____

_____

Action Taken:

_____

_____

_____

_____

_____

_____

APPENDIX D

PROJECT SCHEDULE

ENVIRONMENTAL PROJECT SCHEDULE
53 Putnam Street BCP #C546057
Saratoga Springs, NY

As of 10/18/2018	2019															
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Task Name																
Remedial Investigation																
Remedial Investigation (RI) Work Plan Review & Approval																
Mail RI Work Plan fact sheet to site contact list; Conduct 30-day public comment period																
Perform Remedial Investigation																
Prepare and Submit Draft RI Report																
NYSDEC Review of RI Report																
Revise and Submit Final RI Report																
Mail fact sheet to site contact list about RI results																
Remedial Action Work Plan (RAWP)																
Prepare and Submit Draft Remedial Action Work Plan																
NYSDEC Review RAWP																
Revise and Submit Final RAWP; NYSDEC Approves RAWP																
Demolish Building to Prepare for Remediation																
Mail fact sheet to site contact list about draft RAWP and conduct 45-day public comment period																
Implement Remedial Measures																
Mail fact sheet to site contact list about upcoming Remedial Measures																
Prepare Bid Documents, Solicit Bids, Select Remediation Contractors																
Implement RAWP																
Perform Post-Remediation Monitoring																
Final Engineering Report(FER)/Site Management Plan (SMP)																
Prepare and Submit Draft FER/SMP																
NYSDEC Review of Draft FER/SMP																
Revise FER/SMP																
Issue Final FER/SMP including Environmental Easement																
Mail fact sheet to site contact list about FER																
Environmental Easement																
Submit Environmental Easement Information to DEC																
NYSDEC Prepare Environmental Easement																
File Environmental Easement																
NYSDEC Issues Certificate of Completion																
Mail fact sheet to site contact list about issuance of COC																