Phase II Environmental Site Assessment Work Plan

Vacant Parcels

Rockaway Avenue & Chester Street
Brooklyn, New York

PREPARED FOR

Blue Sea Development Company, LLC
164 Main Street
Huntington, New York 11743

PREPARED BY

One Penn Plaza, Suite 715
New York, NY 10119

August 16, 2019

Table of Contents

List of Appendices

LIST OF ACRONYMS

Acronym	Definition
AST	Aboveground Storage Tank
CAMP	Community Air Monitoring Plan
C&D	Construction & Demolition
CEQR	City Environmental Quality Review
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
CO	Certificate of Occupancy
CPC	City Planning Commission
DSNY	Department of Sanitation
“E”	E-Designation
EAS	Environmental Assessment Statement
EIS	Environmental Impact Statement
ESA	Environmental Site Assessment
EC/IC	Engineering Control and Institutional Control
ELAP	Environmental Laboratory Accreditation Program
FDNY	New York City Fire Department
GPR	Ground Penetrating Radar
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations Emergency Response
IDW	Investigation Derived Waste
Notice - NNO	Notice of No Objection
Notice - NTP	Notice To Proceed
Notice - NOS	Notice Of Satisfaction
Notice - FNOS	Final Notice of Satisfaction
NYCBSA	New York City Board of Standards and Appeals
NYCDCP	New York City Department of City Planning
NYCDEP	New York City Department of Environmental Protection
NYCDOB	New York City Department of Buildings
NYCDOF	New York City Department of Finance
NYCHPD	New York City Housing Preservation and Development
NYCRR	New York Codes Rules and Regulations

NYCOER	New York City Office of Environmental Remediation
NYSDEC	New York State Department of Environmental Conservation
NYSDEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYSDEC PBS	New York State Department of Environmental Conservation Petroleum Bulk Storage
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
OSHA	United States Occupational Health and Safety Administration
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PE	Professional Engineer
PID	Photo Ionization Detector
PM	Particulate Matter
QEP	Qualified Environmental Professional
RA	Register Architect
RAP	Remedial Action Plan
RCA	Recycled Concrete Aggregate
RCR	Remedial Closure Report
RD	Restrictive Declaration
RI	Remedial Investigation
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SSDS	Sub-Slab Depressurization System
SVOCs	Semi-Volatile Organic Compounds
USCS	Unified Soil Classification System
USGS	United States Geological Survey
UST	Underground Storage Tank
TAL	Target Analyte List
TCL	Target Compound List
TCO	Temporary Certificate of Occupancy
VB	Vapor Barrier

VOCs	Volatile Organic Compounds

1.0

Introduction

This Phase II Environmental Site Assessment (ESA) Work Plan and Health and Safety Plan (HASP) have been developed by VHB in connection with 18 vacant parcels located on the east side of Chester Street and the west side of Rockaway Avenue, between East New York Avenue to the north and Pitkin Avenue to the south, in the Brownsville neighborhood of the Borough of Brooklyn, City of New York, Kings County, New York (hereinafter referred to as the "subject properties"). The subject properties are identified by the street addresses and New York City (NYC) Tax Map Block and Lot Nos. noted below:

Parcel	Block	Lot	Address
1	3499	15	47 Chester Street
2	3499	17	Chester Street
3	3499	20	31 Chester Street
4	3499	21	29 Chester Street
5	3499	22	27 Chester Street
6	3499	23	Chester Street
7	3499	24	Chester Street
8	3499	45	348 Rockaway Avenue
9	3499	46	354 Rockaway Avenue
10	3499	47	356 Rockaway Avenue
11	3499	48	Rockaway Avenue
12	3499	50	376 Rockaway Avenue
13	3499	52	380 Rockaway Avenue
14	3499	53	382 Rockaway Avenue
15	3499	54	384 Rockaway Avenue
16	3499	56	388 Rockaway Avenue
17	3499	57	390 Rockaway Avenue
18	3499	58	392 Rockaway Avenue

This Work Plan has been prepared to investigate subsurface conditions in association with a proposed redevelopment at the subject property. The site-specific HASP (Appendix C) addresses potential hazards, and contaminants of concern based on past use and safety requirements associated with investigation activities, in accordance with American Society of Testing and Materials (ASTM) and Occupational Safety and Health Administration (OSHA) guidelines. A Site Location Map and Aerial Photograph are included as Figures 1 and 2 in Appendix A, respectively.

1.1 Site Location and Current Usage

The subject properties consist of eighteen (18) contiguous parcels that are predominantly vacant and vegetated, with the exception of Lot 45 (348 Rockaway Avenue) which is partially being utilized as an electrical supply storage yard, associated with the adjacent business to the north, Colonial Electrical Supply, located at 326 Rockaway Avenue.

The subject properties are predominantly vegetated and enclosed by a chain-link fence on all sides. Two gated entrances are secured with padlocks, one on Chester Street and the other on Rockaway Avenue. Two storage containers are located in the northeastern and southeastern portions of the subject properties. In the northern portion of the subject properties, there is a vegetated soil stockpile, a downed tree, and various refuse and garbage strewn about. The southwestern portion of the subject properties appears to be utilized as a driveway for the adjacent residential structure to the south, containing a vehicle behind a locked chain-link fence/gate.

1.2 Proposed Redevelopment Plan

The subject properties are proposed for redevelopment with the nine-story Brownsville Arts Center and Apartments (BACA). The project will bring 230 apartments to the neighborhood and will be geared toward low-income and formerly homeless New Yorkers. The building will also feature a host of arts and culture components like a black box theater, a music school, a performing arts school and a media lab.

1.3 Description of Surrounding Properties

Adjacent to the north is a commercial electrical supply business, located on the southern side of East New York Avenue. Beyond are numerous commercial and mixed-use commercial and multi-family residential properties. Multi-family residences along Chester Street and commercial and mixed-use commercial and residential properties along Rockaway Avenue to the south, with commercial

properties along Pitkin Avenue, beyond. Commercial and mixed-use commercial and residential properties along Rockaway Avenue are present to the east, with multi-family public housing beyond. Institutional properties and multi-family residences to the west across Chester Street, and beyond.

1.4 Investigation Rationale

The subject properties were evaluated in a Phase I Environmental Site Assessment (ESA), dated March 11, 2019 and prepared by VHB (hereinafter the "Phase I ESA"). The Phase I ESA included an evaluation of the on-site conditions as well as site history, and surrounding/neighboring properties that may have the potential to have impacted the subject properties (as summarized in Section 2.0, below). Based upon the proposed redevelopment plans, as well as the findings and conclusions of VHB's Phase I ESA, the New York City Department of Housing Preservation and Development (HPD) requested a Phase II ESA Work Plan be prepared and submitted to the reviewing agency (the New York City Department of Environmental Protection [NYCDEP]) in tandem with the Phase I ESA for review and approval. As such, in accordance with Chapter 12, Section 300 of the *2014 CEQR Technical Manual*, with regulatory oversight provided by NYCDEP, this Phase II ESA Work Plan and associated HASP have been prepared.

2.0

Previous Environmental Documentation

2.1 Environmental Investigation Reports

The following environmental report was developed that included the subject properties:

- Phase I Environmental Site Assessment, Mach 11, 2019, prepared by VHB

A digital copy of VHB's Phase I ESA is included in Appendix B.

2.2 Environmental Investigation Reports

Based upon the results of the March 11, 2019 Phase I ESA, prepared by VHB, it was determined that there was one recognized environmental condition (REC) identified for the subject properties. This REC is summarized as follows:

- *Given the development history of the subject properties, several manufacturing uses were identified on Lot Nos. 48, 50, 54, 56, 57, and 58. Specifically, several furniture upholsterers, cabinet manufacturing, and stone cutting and manufacturing operations occupied these parcels. Former manufacturing relating to furniture upholstering has the potential to have impacted subsurface conditions based on the products utilized during these processes. Same represent a REC for the subject properties.*

In addition to the aforementioned RECs, the following business environmental risks (BERs) were identified during the course of VHB's Phase I ESA:

- *Based upon available New York City Department of Buildings (NYCDOB) records, fuel oil burner applications were identified for several of the former buildings on Lot*

Nos. 17, 46, 50, and 56. As such, there is a potential for fuel oil to have been previously utilized in the former on-site buildings. The site-reconnaissance identified former building foundations and slabs across the subject properties. It is possible that any potential tanks, including basement aboveground storage tanks (ASTs), may have been removed prior to demolition. However, VHB was unable to verify the existence of any potential petroleum storage tanks at the subject property based on the lack of tank documentation including registrations and municipal records. As such, the potential presence of petroleum storage tanks at the subject properties represents a BER.

- *Based on a review of historic Sanborn Fire Insurance maps, historic aerial photographs, and NYCDOB records, the subject properties were improved with residential and commercial structures since at least 1907 until the mid-1980s, when all structures were demolished. During the site reconnaissance, VHB observed evidence of several former building foundations. This would indicate that at least some of the former buildings were demolished into their basements. Given the history of the subject properties and lack of demolition records, the presence of urban fill material can be expected. Although the presence of urban fill material is typical in densely developed portions of New York City, it should be dealt with accordingly prior to any potential redevelopment. The likely presence of fill materials beneath the subject properties is considered a BER.*

- *Although the subject properties are currently vacant and undeveloped, several of the former structures were listed in the NYCDOB records database as containing elevators. Given that the subject properties have been developed with various commercial and residential structures since at least 1907, the ages of the former on-site buildings would indicate the potential for building materials to contain polychlorinated biphenyls (PCBs). As demolition of all on-site buildings occurred between 1972 and 1984, it cannot be verified whether any PCB containing materials were properly disposed prior to demolition. Therefore, based on the potential presence of PCBs in demolition debris, same is considered a BER.*

- *A visual inspection of potential painted surfaces was conducted during the site reconnaissance. Although, no painted surfaces were observed, based upon the ages of the former on-site buildings and lack of demolition records, there is a potential for LBP to be present in demolition debris. Same is considered a BER for the subject properties.*

- *No suspect ACM was observed during the visual inspections. However, given the age of the former on-site buildings, the demolition debris could potentially contain roofing materials or insulation that have the potential to be considered ACM. Same is considered a BER for the subject properties.*

3.0

Phase II Environmental Site Investigation

3.1 Investigation Procedures

Geophysical Survey

Prior to invasive work, a one-call utility mark-out will be completed in accordance with local laws to locate buried electric, natural gas, telecommunications, utilities, etc. In addition, there is a potential for subsurface infrastructure (electric, drainage etc.) to be present at the subject properties that will require identification prior to commencement of soil borings. Furthermore, no representation could be made with respect to the presence of fuel oil USTs in the Phase I ESA. Given these conditions, a geophysical survey (e.g., magnetometer and/or ground-penetrating radar [GPR] surveys) will be conducted by a subcontractor to determine the locations and configurations of sub-grade utilities and drainage infrastructure in preparation for sampling events. The sub-grade features will be marked out in preparation for soil, groundwater and soil vapor sampling activities.

Soil Samples

In order to evaluate subsurface conditions throughout the subject properties, eleven (11) soil borings are proposed (see Figure 3 in Attachment A). Based on the Phase I ESA site reconnaissance, it is expected that there may be former building foundations and slabs still present at the subject properties. Therefore, conventional soil borings with a Geoprobe® hydraulic push drill rig may prove to be ineffective. As such, soil borings will be installed by a subcontractor utilizing a Sonic® rotary drill rig. This drilling method ensures that the concrete slab below the surface and anomalies, boulders or rock at depth will not impede the collection of soil samples. Continuous split spoon soil samples will be collected by the subcontractor at each boring location.

In accordance with the *2014 CEQR Technical Manual*, soil samples will be collected from the surface (or just below the existing grass mat or pavement, to the base of the

assumed excavation depth (approximately 13-feet below grade surface [bgs]) within each respective location, or just above the saturation zone (whichever is encountered first). Based on the information provided in VHB's Phase I ESA, groundwater is expected to be present at approximately 39-feet bgs. Therefore, it is anticipated that deeper soils will be sampled at approximately 13-feet bgs.

All field equipment associated with the Sonic® drill rig will be field decontaminated by the subcontractor between boring locations using an Alconox detergent/potable water wash and potable water rinse.

Twenty-two (22) soil samples will be collected and submitted for laboratory analysis in association with the eleven (11) investigatory soil borings (i.e., two (2) soil samples per boring location). One surficial (zero-to-two feet bgs, or just below the grass mat/asphalt pavement) and one deeper sample at the anticipated excavation depth (13-feet bgs) (or at refusal) will be collected at each soil boring location (whichever encountered first). Sample depth intervals may be adjusted at the discretion of the Environmental Consultant should any soils be observed that exhibit suspect characteristics (e.g., staining, odors, positive photoionization detector [PID] readings, etc.).

UST Investigation (If Present)

If a UST is identified during the subsurface investigation, soil samples will be collected in order to determine the presence of any impacts relating to same. If a UST is confirmed to be present, the UST will be properly delineated during the geophysical survey. Pursuant to the *CEQR Technical Manual*, two (2) soil borings will be advanced utilizing the Sonic® rotary drill rig adjacent to the UST at exact locations to be determined based on field conditions.[1] The soil borings, will be advanced to just below the expected base of the suspect UST, or to refusal, if encountered. Continuous soil samples will be collected by the subcontractor utilizing factory-new macrocore soil sampling tubes from each soil boring location. All field equipment associated with the Sonic® rotary drill rig will be field decontaminated by the subcontractor between boring locations using an Alconox detergent/potable water wash and potable water rinse. Soil samples exhibiting the greatest suspect characteristics (e.g., staining, odors, positive PID responses, etc.) will be submitted for analysis (if suspect characteristics are identified). Two (2) soil samples will be collected from each boring location. One surficial (zero-to-two feet bgs, or just below the existing building slab) and one deeper sample (just below the base of the tank invert depth, or at refusal, if encountered) will be collected at each boring location surrounding the UST (if present). Should soils be observed that exhibit suspect characteristics (e.g., staining, odors, positive PID responses, etc.), additional soil borings adjacent to the UST may be contemplated, and an additional (third) soil

[1] For the purposes of this Phase II ESA Work Plan, no drumming or disposal of drill spoils is anticipated.

sample will be collected, where appropriate, from a select boring location and will be submitted for analysis.

Soil Sample Analysis

Soil samples will be transferred directly into laboratory-supplied glassware, stored in an ice-packed cooler and transported to a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) and National Environmental Laboratory Accreditation Program (NELAP)-certified laboratory under appropriate chain-of-custody protocols. As previously indicated, it is anticipated that up to twenty-six (26) soil samples (22 exploratory soil boring samples and four [4] samples from one [1] potentially identified UST) will be submitted for laboratory analysis.

Soil samples associated with the soil investigation, in accordance with the *2014 CEQR Technical Manual*, will be submitted for the following analysis:

- Target Compound List (TCL) of VOCs using USEPA Method 8260.[2]
- TCL semi-volatile organic compounds (SVOCs) using USEPA Method 8270.
- Target Analyte List (TAL) Metals using USEPA Methods 6010 and 7471.
- Pesticides using USEPA Method 8081.
- Polychlorinated biphenyls (PCBs) using USEPA Method 8082.

Groundwater Investigation

In accordance with Chapter 12 of the CEQR Technical Manual, an evaluation of groundwater will be conducted at the subject property. Based upon the size of the subject property, three (3) groundwater samples will be collected at the subject property. Based upon information provided in VHB's Phase I ESA, groundwater beneath the subject property is anticipated to be present at approximately 39 feet bgs. Utilizing the Sonic® rotary drill, the three (3) groundwater samples will be collected at three of the aforementioned soil boring locations at the site in order to establish baseline groundwater conditions (groundwater sample locations depicted on Figure 3). The groundwater investigation will also determine if any historic off-site conditions previously identified in VHB's Phase I ESA have impacted groundwater quality beneath the subject properties. It should be noted that a monitoring well was observed in the sidewalk along the northwestern corner of the subject properties. The purpose of the monitoring well is unknown, but may have been installed for geotechnical observation purposes. The viability of the monitoring well is also unknown, but will be evaluated during the field activities. If determined to be viable, a groundwater sample will be collected from this monitoring well as an alternative to one (1) of the three (3) groundwater samples proposed from the respective boring locations.

▼

[2] For the purposes of this Phase II ESA Work Plan, VOC soil/sediment samples will be preserved using USEPA Method 5035.

Temporary groundwater monitoring wells will be installed utilizing the Sonic® rotary drill rig (re-usable drilling equipment will be field decontaminated between uses) at three of the soil boring locations (and/or in association with the one monitoring well, if viable) depicted on Figure 3. Factory-new, disposable polyethylene tubing equipped with a check valve will be inserted into the screened intervals of the monitoring wells. Based upon the property's elevation, as well as previous geotechnical data, groundwater is expected to be encountered at approximately 39 feet bgs.

Purging the groundwater monitoring well ensures a direct connection between the well and the surrounding aquifer. Using the hand oscillatory method and/or peristaltic pump, the groundwater will be drawn to the surface. Groundwater will be purged onto the ground surface or into a nearby on-site storm drain until turbidity is visibly reduced prior to sample collection.

Groundwater Sample Analysis

The groundwater samples will be collected directly into laboratory-supplied glassware, stored in ice-packed coolers and transported to an ELAP and NELAP-certified laboratory under appropriate chain-of-custody protocols. For the purposes of this Phase II ESA Work Plan, and in accordance with the *2014 CEQR Technical Manual*, the groundwater samples associated with the subsurface investigation will be submitted for the following analyses:

- TCL VOCs using USEPA Method 8260
- TCL SVOCs using USEPA Method 8270
- TAL metals (total and dissolved concentrations [a.k.a. filtered and unfiltered]) using USEPA Methods 6010 and 7471.
- Pesticides using USEPA Method 8081.
- PCBs using USEPA Method 8082.

Soil Vapor Investigation

A soil vapor study to assess the potential for the presence and migration of VOCs beneath the Site will be conducted. Four (4) soil vapor samples will be collected throughout the subject properties as part of the subsurface investigation (proposed soil vapor sample locations depicted on Figure 3 in Attachment A).

The four (4) soil vapor samples to be collected within the footprint of the proposed building will be installed at a depth of approximately 14-feet bgs, to be considered as representative of future sub-slab conditions. The soil vapor implants will consist of either factory-new polyethylene tubing, soil vapor point, or a field decontaminated stainless steel retract-a-tip soil vapor screen attached to factory-new polyethylene tubing, set at the predetermined depth. The annular space surrounding the sample tubing will be filled with washed #1 crushed stone or washed gravel. The soil vapor

sample will be sealed into the ground using modeling clay or a clay bentonite seal in order to prevent ambient air from being drawn into the boreholes and mixing with the soil vapor to be sampled. The area immediately surrounding the sample location will be sealed with bentonite clay and a canister; thus creating an annular space. Helium will be introduced into the annular space as a tracer gas for quality assurance/quality control (QA/QC) analysis.

Prior to sampling, each soil vapor point will be purged of three (3) tube volumes of vapor. A 2.7-liter, laboratory-supplied vacuum Summa canister will then be connected to the polyethylene tubing. As no existing buildings are present at the subject properties, no indoor air samples or sub-slab soil vapor samples are proposed. Each soil vapor sample will be collected over a two-hour period at a pre-determined flow rate calibrated by the laboratory and consistent with NYSDOH Guidance.

Soil Vapor Sample Analysis

The Summa canisters will be submitted to an ELAP and NELAP-certified laboratory for VOCs using USEPA Method TO-15 in accordance with the *2014 CEQR Technical Manual*, and the New York State Department of Health (NYSDOH) October 2006 *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*. In addition, each soil vapor sample will be analyzed for helium as a tracer gas for QA/QC purposes.

Investigation Derived Waste

Cuttings may be disposed at the subject property within the borehole that generated them to within 24 inches of the surface unless:

- Free product or grossly contaminated soil are present in the cuttings.
- The borehole has penetrated an aquitard, aquiclude or other confining layer; or extends significantly into bedrock.
- Backfilling the borehole with cuttings will create a significant path for vertical movement of contaminants. Soil additives (bentonite) may be added to the cuttings to reduce permeability.
- The soil cannot fit into the borehole.

Contaminated soil cuttings, if encountered, will be placed in sealed and labeled DOT-approved 55-gallon drums pending off-site disposal at a permitted facility. All boreholes which require drill cuttings disposal would ultimately be filled with bentonite chips and hydrated. Disposable sampling equipment including, spoons, gloves, bags, paper towels, etc. that came in contact with environmental media will be double bagged and disposed as municipal trash in a facility trash dumpster as non-hazardous trash.

3.2 Reporting

A Phase II ESA Report (hereinafter the "Report") will be prepared following completion of the field activities and receipt of the laboratory data. The Report will provide detailed summaries of the investigative findings. Soil boring analytical results will be compared to the NYSDEC Part 375-6.8(a) Track One Unrestricted Used Soil Cleanup Objectives and Part 375-6.8(b) Track Two Restricted Residential Soil Cleanup Objectives. Groundwater will be compared to the NYSDEC Technical and Operation Guidance Series (TOGS) 1.1.1 list of Ambient Water Quality Standards and Guidance Values (AWQSGV) and Groundwater Effluent Limitations, June, 1998. Soil vapor results will be compared to the NYSDOH 75th Percentiles for Indoor Air concentrations, as outlined in Table C1: NYSDOH 2003: Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes in the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006. In addition to the Guidance, the following VOCs are subject to, and will be evaluated in accordance with the NYSDOH Soil Vapor/Indoor Air Matrices:

- Carbon tetrachloride
- 1,1-dichloroethene
- Cis-1,2-dichloroethene
- Tetrachloroethene (PCE)
- 1,1,1-trichloroethane (1,1,1-TCA)
- Trichloroethene (TCE)
- Vinyl chloride

The Report will include an updated Site Plan and remedial recommendations, as warranted.

4.0

Quality Assurance/Quality Control

4.1 Quality Assurance/Quality Control Procedures

QA/QC procedures will be used to provide performance information with regard to accuracy, precision, sensitivity, representation, completeness, and comparability associated with the sampling and analysis for this investigation. Field QA/QC procedures will be used (1) to document that samples are representative of actual conditions at the Site and (2) identify possible cross-contamination from field activities or sample transit. Laboratory QA/QC procedures and analyses will be used to demonstrate whether analytical results have been biased either by interfering compounds in the sample matrix, or by laboratory techniques that may have introduced systematic or random errors to the analytical process. A summary of the field and laboratory QA/QC procedures is provided below.

4.2 Field QA/QC

Field QA/QC will include the following procedures:

- Calibration of field equipment, including PID, on a daily basis
- Use of dedicated and/or disposable field sampling equipment
- Proper sample handling and preservation
- Proper sample chain of custody documentation
- Completion of report logs

The above procedures will be executed as follows:

- Disposable sampling equipment, including acetate sleeves, latex gloves, and disposable bailers (or sample tubing), will be used to minimize cross-contamination between samples.

- For each of the parameters analyzed, a sufficient sample volume will be collected to adhere to the specific analytical protocol, and provide sufficient sample for reanalysis if necessary.
- Because plasticizers and other organic compounds inherent in plastic containers may contaminate samples requiring organic analysis, samples will be collected in glass containers, with the exception of the nitrate-preserved groundwater sample for metals analysis.
- Appropriate sample preservation techniques, including cold temperature storage at 4º C, will be utilized to ensure that the analytical parameters concentrations do not change between the time of sample collection and analysis.
- Samples will be analyzed prior to the expiration of the respective holding time for each analytical parameter to ensure the integrity of the analytical results.

4.3 Sample Custody

Sample handling in the field will conform to appropriate sample custody procedures. Field custody procedures include proper sample identification, chain-of-custody forms, and packaging and shipping procedures. Sample labels will be attached to all sampling bottles before field activities begin to ensure proper sample identification. Each label will identify the site and sample location. Styrofoam or bubble wrap will be used to absorb shock and prevent breakage of sample containers. Ice or ice packs will be placed in between the plastic bags for sample preservation purposes.

After each sample is collected and appropriately identified, the following information will be entered into the chain-of-custody form:

- Site name and address
- Sampler(s)' name(s) and signature(s)
- Names and signatures of persons involved in the chain of possession of samples
- Sample number
- Number of containers
- Sample location
- Date and time of collection
- Type of sample, sample matrix and analyses requested
- Preservation used (if any)
- Any pertinent field data collected (pH, temperature, conductivity, Dissolved Oxygen [DO])

The sampler will sign and date the "Relinquished" blank space prior to removing one copy of the custody form and sealing the remaining copies of the form in a Ziploc plastic bag taped to the underside of the sample cooler lid. The sample cooler will be sealed with tape prior to delivery or shipment to the laboratory.

4.4 Report Logs

Field logs and borings logs will be completed during the course of this investigation. A field log will be completed on a daily basis which will describe all field activities including:

- Project number, name, manager, and address
- The date and time
- The weather conditions
- On-site personnel and associated affiliations
- Description of field activities
- Pertinent sample collection information including sample identification numbers, description of samples, location of sampling points, number of samples taken, method of sample collection and any factors that may affect its quality, time of sample collection, name of collector, and field screening results

A boring log will be completed for each boring and will include the following information:

- Project number, name, manager, and location
- The date and time
- Drilling company and method used
- Boring number
- Total boring depth and water table depths

Pertinent soil sample information including sample number, interval, depth, amount recovered, color, composition, percent moisture, visual and olfactory observations of contamination, and PID readings.

4.5 Laboratory QA/QC

An ELAP-certified laboratory will be used for all sample analyses. The laboratory will follow the following QA/QC protocols. All samples will be delivered to the laboratory within 24 hours of sample collection. Samples will be received by laboratory personnel, who will inspect the sample cooler(s) to check the integrity of the custody seals. The cooler(s) will then be opened, the samples unpackaged, and the information on the chain-of-custody form examined. If the shipped samples match those described on the chain-of-custody form, the laboratory sample custodian will sign and date the form on the next "Received" blank and assume responsibility for the samples. If problems are noted with the sample shipment, the laboratory custodian will sign the form and record problems in the "Remarks" box. The custodian will then immediately notify the Project Manager so appropriate follow-up steps can be implemented on a timely basis.

A record of the information detailing the handling of a particular sample through each stage of analysis will be maintained by the laboratory. The record will include:

- Job reference, sample matrix, sample number, and date sampled
- Date and time received by laboratory, holding conditions, and analytical parameters
- Extraction date, time and extractor's initials (if applicable), analysis date, time, and analyst's initials
- QA batch number, date reviewed, and reviewer's initials

5.0

Health and Safety Plan (HASP)

5.1 Health and Safety Plan (HASP)

The investigation HASP is included as Appendix C. The Site Safety Coordinator will be Bryan Murty. Investigative work performed under this Work Plan will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and Hazardous Waste Operations and Emergency Response (HAZWOPER) requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the investigation work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations.

All field personnel involved in investigation activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers' training records.

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign a HASP acknowledgment. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the Site location before any work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form. Potential on-site chemicals of concern include VOCs, SVOCs, Pesticides/PCBs, and heavy metals (specifically arsenic, lead, and mercury at a minimum). Information fact sheets for each contaminant group and/or MSDS' are included in the HASP. An emergency contact sheet with names and phone numbers for all pertinent project personnel as well as regulatory hotline information is included in the HASP. That document will define the specific project contacts for use in case of emergency.

This Phase II Environmental Site Assessment Work Plan was prepared by:

Prepared by: Bryan Murty
Senior Project Manager, NYC HazMat Services
VHB Engineering, Surveying, Landscape Architecture and Geology, P.C.

Signature: by: _____

Supervised by: Stephen Kaplan, PG
Director of OHM Services
VHB Engineering, Surveying, Landscape Architecture and Geology, P.C.

Signature: by: _____

Appendix A
Figures

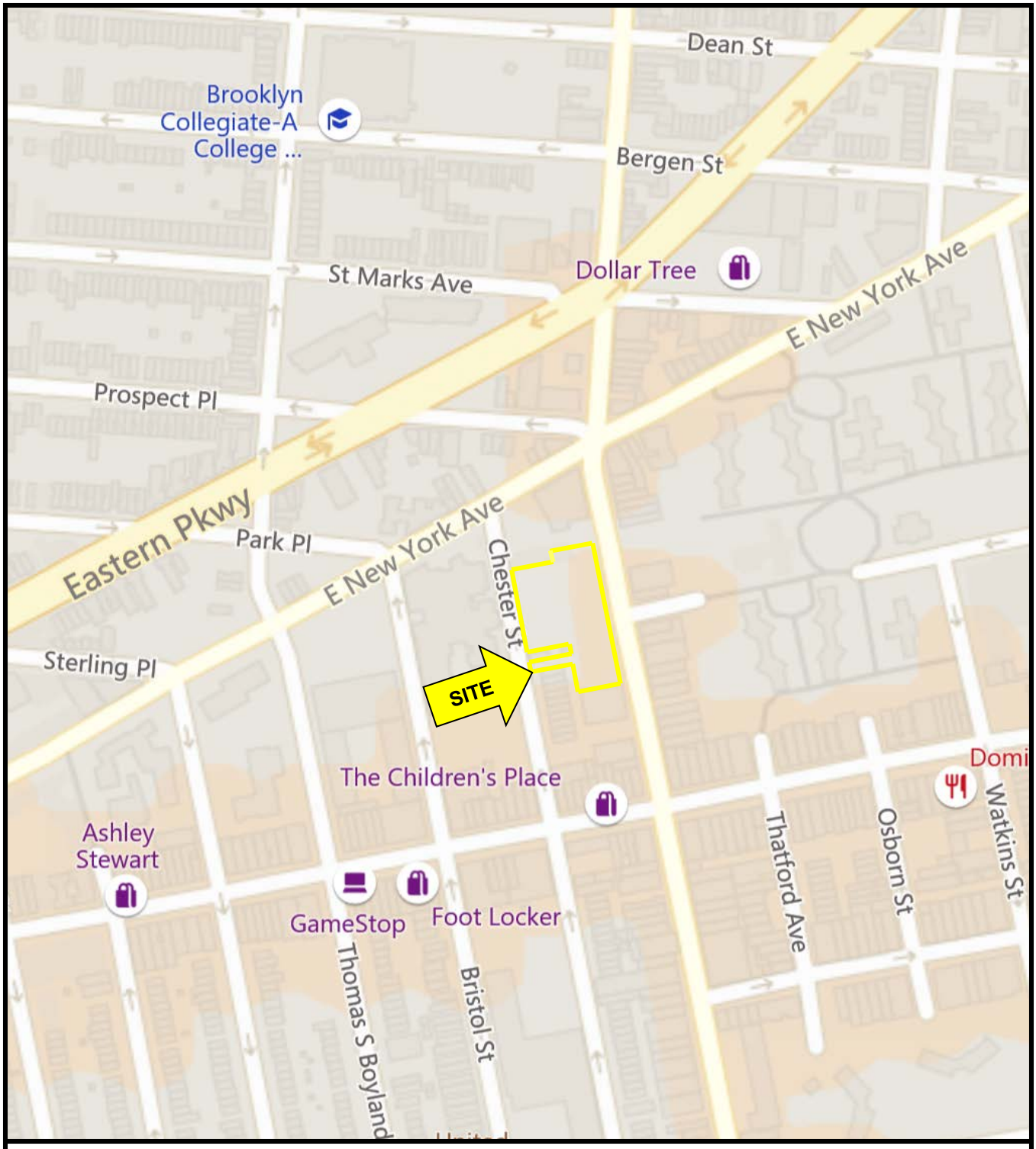


FIGURE 1 – SITE LOCATION MAP

SITE NAME: Blue Sea - Brownville
MUNICIPALITY, STATE, ZIP: Brooklyn, New York 11212
PROJECT NUMBER: 26979.00
SOURCE: Bing Maps, 2019

PROJECT NORTH

vhb

FIGURE 2 – SITE AERIAL PHOTOGRAPH

SITE NAME: Blue Sea - Brownsville
MUNICIPALITY, STATE, ZIP: Brooklyn, New York 11212
PROJECT NUMBER: 26979.00
SOURCE: Google Earth Aerial Imagery, 2017

PROJECT NORTH

vhb

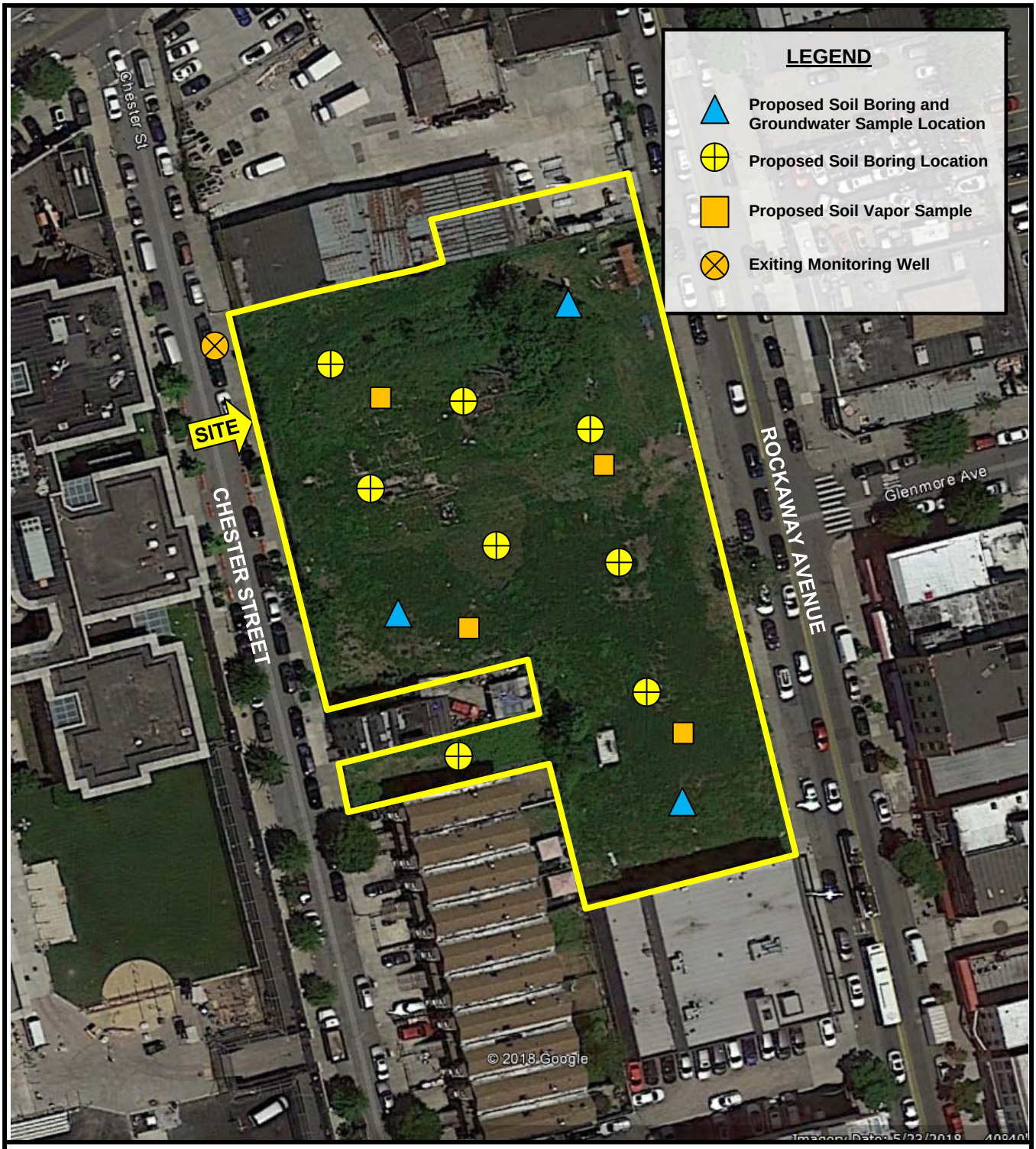


FIGURE 3– PROPOSED SAMPLE LOCATIONS

SITE NAME: Vacant Parcels
ADDRESS: Rockaway Avenue & Chester Street
CITY, STATE and ZIP: Brooklyn, New York 11218
PROJECT NUMBER: 26645.00
SOURCE: Google Earth, 2016

PROJECT NORTH

vhb

Appendix B
Supporting Reports and Documentation

Appendix C
VHB Health and Safety Plan, including Standard Operating Procedures for Sonic® Rotary Drill Rig Operation, August 19, 2019.

Project Health and Safety Plan, including Standard Operation Procedures for Sonic Drill Rig Operation

Vacant Parcels

Rockaway Avenue & Chester Street

Brooklyn, New York

PREPARED FOR

Blue Sea Development Company, LLC
164 Main Street
Huntington, New York 11743

PREPARED BY

One Penn Plaza, Suite 715
New York, NY 10119

August 16, 2019

Table of Contents

List of Attachment

Attachment	Description
A	Figures
B	Site Safety Plan Acknowledgement Form
C	Site Safety Plan Amendments
D	Heat/Cold Stress Protocols
E	Drilling/Probing Protocols
F	Miscellaneous Task SOPs and Safety Measures
G	Chemical Hazards
H	Confined Space Entry Checklist/Permit
I	Emergency Telephone Numbers
	Hospital Information and Map
	Field Accident Report

Glossary of Common Acronyms

ACGIH - American Conference of Governmental Industrial Hygienists
ANSI - American National Standards Institute
APR - Air Purifying Respirator
C&D – Construction and Demolition
CFR - Code of Federal Regulations
CGI - Combustible Gas Indicator
CSEP - Confined Space Entry Permit
DECON – Decontamination
ESA - Environmental Site Assessment
ESI – Environmental Site Investigation
FID - Flame Ionization Detector
HEPA – High Efficiency Particulate Air
HASP - Health and Safety Plan
IDLH - Immediately Dangerous to Life and Health
LEL - Lower Explosive Limit
MSDS - Material Safety Data Sheets
NIOSH - National Institute for Occupational Safety and Health
OSHA - Occupational Safety and Health Administration
OVA - Organic Vapor Analyzer
PID - Photoionization Detector
PEL - Permissible Exposure Limit
PPB – Parts Per Billion
PPE - Personal Protective Equipment
PPM – Parts Per Million
REC – Recognized Environmental Condition
SCBA - Self Contained Breathing Apparatus
SOP - Standard Operating Procedure
SPCC - Spill Prevention Controls and Countermeasures
SVOC – Semi-Volatile Organic Compound
TLV - Threshold Limit Value
TWA - Time Weighted Average
UEL - Upper Explosive Limit
UIC - Underground Injection Control

Statement of Commitment

On-site employees may be exposed to risks from hazardous conditions related to a geophysical survey, the collection of soil, groundwater and soil vapor samples as part of the Phase II Environmental Site Assessment (ESA) for the 18 vacant parcels located on the east side of Chester Street and the west side of Rockaway Avenue, between East New York Avenue to the north and Pitkin Avenue to the south, in the Brownsville neighborhood of the Borough of Brooklyn, City of New York, Kings County, New York (hereinafter referred to as the "subject properties"). The subject properties are identified by the street addresses and New York City (NYC) Tax Map Block and Lot Nos. noted below:

Parcel	Block	Lot	Address
1	3499	15	47 Chester Street
2	3499	17	Chester Street
3	3499	20	31 Chester Street
4	3499	21	29 Chester Street
5	3499	22	27 Chester Street
6	3499	23	Chester Street
7	3499	24	Chester Street
8	3499	45	348 Rockaway Avenue
9	3499	46	354 Rockaway Avenue
10	3499	47	356 Rockaway Avenue
11	3499	48	Rockaway Avenue
12	3499	50	376 Rockaway Avenue
13	3499	52	380 Rockaway Avenue
14	3499	53	382 Rockaway Avenue
15	3499	54	384 Rockaway Avenue
16	3499	56	388 Rockaway Avenue
17	3499	57	390 Rockaway Avenue
18	3499	58	392 Rockaway Avenue

The subject properties consist of eighteen (18) contiguous parcels that are predominantly vacant and vegetated, with the exception of Lot 45 (348 Rockaway Avenue) which is partially being utilized as an electrical supply storage yard, associated with the adjacent business to the north, Colonial Electrical Supply, located at 326 Rockaway Avenue.

The subject properties are predominantly vegetated and enclosed by a chain-link fence on all sides. Two gated entrances are secured with padlocks, one on Chester Street and the other on Rockaway Avenue. Two storage containers are located in the northeastern and

southeastern portions of the subject properties. In the northern portion of the subject properties, there is a vegetated soil stockpile, a downed tree, and various refuse and garbage strewn about. The southwestern portion of the subject properties appears to be utilized as a driveway for the residential structure adjacent to the south, containing a vehicle behind a locked chain-link fence/gate.

VHB's policy is to minimize the possibility of work-related injury through aware and qualified supervision, health and safety training, medical monitoring, use of appropriate personal protective equipment, and the activity-specific safety protocols contained in this Health and Safety Plan (HASP). VHB has established a guidance program to implement this policy in a manner that protects personnel to the maximum reasonable extent.

This HASP, which applies to personnel actually or potentially exposed to safety or health hazards, describes emergency response procedures for actual and potential physical and chemical hazards. This HASP is also intended to inform and guide all personnel entering the work area or exclusion zone. All persons are to acknowledge that they understand the potential hazards and the contents of this HASP by signing off upon receipt of their individual copy of the document. A copy of that Site Safety Plan Acknowledgement Form is included in Attachment B of this HASP. Contractors and suppliers are retained as independent contractors and are responsible for ensuring the health and safety of their own employees.

VHB may require that its personnel, subcontractors, clients and visitors take certain precautions in accordance with this HASP.

1.0

Introduction and Site Entry Requirements

VHB has prepared this HASP for activities associated with a geophysical survey, the collection of soil vapor samples, and the installation of soil borings and the collection of soil, groundwater and soil vapor samples as part of the Phase II ESA at the subject properties. This HASP addresses the potential physical and chemical hazards that VHB's workers may face while performing the planned site activities. It establishes procedures to minimize worker's exposures through personal protective equipment and safe work practices. The protocols and procedures outlined herein will be used for all planned field activities at the site. A copy of the HASP will be available on site during all field activities and all personnel will be familiar with the document and its requirements.

This HASP has been developed to meet the requirements of the Occupational Safety and Health Administration (OSHA) regulation, Title 29, Code of Federal Regulations. It is intended for the protection of our workers for Scope of Work activities. All others, such as subcontractors, clients and visitors will review the HASP and follow its procedures.

This site-specific HASP is based on information available at the time the plan was prepared. The HASP will be revised when new information is received or as conditions change. A written amendment will be prepared for any activities not covered herein and document all changes made to the HASP. A copy of the Site Safety Plan Amendment form is included in Attachment C of this HASP. The Site Safety Officer (a.k.a. the SSO) and Project Manager (as identified within this HASP) will acknowledge all amendments to the HASP.

1.1 Site Safety Plan Acceptance Acknowledgement

The Project Manager will be responsible for providing a copy of this plan to all personnel that are or may reasonably be expected to work at the site and will request that each person sign the Safety Plan Acknowledgment Form in Attachment B. By signing the Site Safety Plan Acknowledgment Form, personnel are recognizing the actual or potential on-site hazards and

the policies and procedures that design personnel will take to minimize exposure and risk. Site Safety Plan Acknowledgment Forms will also be signed for any Safety Plan Amendments that may be completed during this work. Safety Plan Amendment forms are included in Attachment C.

1.2 Daily Safety Meetings

Each day before work begins, the Site Safety Officer will hold safety (tailgate or tool box) meetings to ensure that all on-site personnel understand the site conditions and operating procedures, to ensure that personal protective equipment is being used correctly and to address safety questions and concerns. Meeting minutes and attendance will be recorded. All personnel eligible to enter the exclusion and decontamination zones must attend the meetings. Project staff will discuss and remedy any health and safety issues at these meetings.

1.3 Key Personnel

The following identifies the key personnel involved with the work, their title, and contact telephone number:

Personnel	Title	Firm	Telephone
Bryan Murty	Site Safety Office, PM	VHB	212-857-7350
Stephen Kaplan	Alt. Site Safety Officer	VHB	631-787-3400

If VHB replaces any of the above, the HASP will be modified accordingly.

1.4 Roles and Responsibilities

The VHB Project Manager is responsible for overall project administration and, with guidance from the VHB Site Safety Officer, for supervising the implementation of this HASP. When the Project Manager is absent from the site, the Site Safety Officer will assume the on-site responsibilities of the Project Manager. All relevant OSHA health and safety standards will apply. The Site Safety Officer will conduct daily (tail gate or tool box) safety meetings at the project site and oversee daily safety issues. Each subcontractor and supplier (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute about health and safety or project activities, on-site personnel will attempt to resolve the issue. If the issue cannot be resolved at the site, the project manager will be consulted.

The VHB Site Safety Officer is also responsible for coordinating and enforcing health and safety activities on-site. The Site Safety Officer must meet the emergency response and hazardous materials training requirements of OSHA 29 CFR Part 1910.120, must have

completed OSHA supervisor training, pursuant to 29 CFR 1910.120 (e) 4; and must have appropriate experience to the related site work. The Site Safety Officer is authorized to suspend the site work based on safety concerns, and is responsible for the following:

- Educating personnel about all of the information in this HASP and any other safety requirements to be observed during site operations, including, but not limited to, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.
- Coordinating site safety decisions with the project superintendent and the Project Manager.
- Designating exclusion, decontamination and support zones on a daily basis.
- Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality monitoring program specified in this HASP.
- Maintaining the exclusion zone entry/exit log and site entry/exit log.
- Maintaining records of safety problems, corrective measures and documentation of any chemical exposures or physical injuries (the Site Safety Officer will document these conditions in a bound notebook and maintain a copy of the notebook on-site).

Any person who observes safety concerns and potential hazards that have not been addressed in the daily safety meetings should immediately report their observations/concerns to the Site Safety Officer or appropriate key personnel.

1.5 Training Requirements

All personnel entering the exclusion zone or decontamination zone must meet the training requirements for hazardous waste site operations and emergency response operations in accordance with OSHA 29 CFR 1910.120(e).

Each subcontractor and supplier working on the job must provide the Site Safety Officer with training documentation for its personnel. This documentation will be reviewed by the Site Safety Officer to ensure compliance with site-specific health and safety rules. The Site Safety Officer may require modifications to the subcontractor or suppliers' safety training documentation if it does not conform to site-specific requirements.

1.6 Medical Monitoring Requirements

All personnel and visitors entering the exclusion zone or decontamination zone must have completed appropriate medical monitoring required under OSHA 29 CFR 1910.120(f). Medical monitoring enables a physician to monitor each employee's health, physical condition, and his fitness to wear respiratory protective equipment and carry out on-site tasks.

Evidence of compliance with any additional medical monitoring requirements for this site must also be included. Subcontractors and suppliers working on the job must provide the Site Safety Officer with documentation on their medical monitoring programs.

1.7 Fit-Testing Requirements

All personnel and visitors entering the exclusion zone or decontamination zone using a negative pressure air purifying respirator (APR) must have successfully passed a qualitative respirator fit test in accordance with OSHA 29 CFR 1910.134 or the American National Standards Institute (ANSI).

Fit testing documentation is the responsibility of each subcontractor. Documentation of VHB's personnel fit-testing is maintained on file.

2.0

Site Background and Scope of Work

2.1 Site Background

The subject properties consist of eighteen (18) contiguous parcels that are predominantly vacant and vegetated, with the exception of Lot 45 (348 Rockaway Avenue) which is partially being utilized as an electrical supply storage yard, associated with the adjacent business to the north, Colonial Electrical Supply, located at 326 Rockaway Avenue.

The subject properties are predominantly vegetated and enclosed by a chain-link fence on all sides. Two gated entrances are secured with padlocks, one on Chester Street and the other on Rockaway Avenue. Two storage containers are located in the northeastern and southeastern portions of the subject properties. In the northern portion of the subject properties, there is a vegetated soil stockpile, a downed tree, and various refuse and garbage strewn about. The southwestern portion of the subject properties appears to be utilized as a driveway for the southern adjacent residential structure, containing a vehicle behind a locked chain-link fence/gate.

The subject properties are proposed for redevelopment with the nine-story Brownsville Arts Center and Apartments (BACA). The project will bring 230 apartments to the neighborhood and will be geared toward low-income and formerly homeless New Yorkers. The building will also feature a host of arts and culture components like a black box theater, a music school, a performing arts school and a media lab.

The subject properties were evaluated in a Phase I ESA, dated March 11, 2019 and prepared by VHB (hereinafter the "Phase I ESA"). The Phase I ESA included an evaluation of the on-site conditions as well as site history, and surrounding/neighboring properties that may have the potential to have impacted the subject properties

Based upon the results of the March 11, 2019 Phase I ESA, prepared by VHB, it was determined that there was one recognized environmental condition (REC) identified for the subject properties. These RECs are summarized as follows:

- *Given the development history of the subject properties, several manufacturing uses were identified on Lot Nos. 48, 50, 54, 56, 57, and 58. Specifically, several furniture*

upholsterers, cabinet manufacturing, and stone cutting and manufacturing operations occupied these parcels. Former manufacturing relating to furniture upholstering has the potential to have impacted subsurface conditions based on the products utilized during these processes. Same represent a REC for the subject properties.

In addition to the aforementioned RECs, the following business environmental risks (BERs) were identified during the course of VHB's Phase I ESA:

- *Based upon available New York City Department of Buildings (NYCDOB) records, fuel oil burner applications were identified for several of the former buildings on Lot Nos. 17, 46, 50, and 56. As such, there is a potential for fuel oil to have been previously utilized in the former on-site buildings. The site-reconnaissance identified former building foundations and slabs across the subject properties. It is possible that any potential tanks, including basement aboveground storage tanks (ASTs), may have been removed prior to demolition. However, VHB was unable to verify the existence of any potential petroleum storage tanks at the subject property based on the lack of tank documentation including registrations and municipal records. As such, the potential presence of petroleum storage tanks at the subject properties represents a BER.*

- *Based on a review of historic Sanborn Fire Insurance maps, historic aerial photographs, and NYCDOB records, the subject properties were improved with residential and commercial structures since at least 1907 until the mid-1980s, when all structures were demolished. During the site reconnaissance, VHB observed evidence of several former building foundations. This would indicate that at least some of the former buildings were demolished into their basements. Given the history of the subject properties and lack of demolition records, the presence of urban fill material can be expected. Although the presence of urban fill material is typical in densely developed portions of New York City, it should be dealt with accordingly prior to any potential redevelopment. The likely presence of fill materials beneath the subject properties is considered a BER.*

- *Although the subject properties are currently vacant and undeveloped, several of the former structures were listed in the NYCDOB records database as containing elevators. Given that the subject properties have been developed with various commercial and residential structures since at least 1907, the ages of the former on-site buildings would indicate the potential for building materials to contain polychlorinated biphenyls (PCBs). As demolition of all on-site buildings occurred between 1972 and 1984, it cannot be verified whether any PCB containing materials were properly disposed prior to demolition. Therefore, based on the potential presence of PCBs in demolition debris, same is considered a BER.*

- *A visual inspection of potential painted surfaces was conducted during the site reconnaissance. Although, no painted surfaces were observed, based upon the ages of the former on-site buildings and lack of demolition records, there is a potential for*

LBP to be present in demolition debris. Same is considered a BER for the subject properties.

- *No suspect ACM was observed during the visual inspections. However, given the age of the former on-site buildings, the demolition debris could potentially contain roofing materials or insulation that have the potential to be considered ACM. Same is considered a BER for the subject properties.*

Based upon the proposed redevelopment plans, as well as the findings and conclusions of VHB's Phase I ESA, the New York City Department of Housing Preservation and Development (HPD) requested a Phase II ESA Work Plan be prepared and submitted to the reviewing agency (the New York City Department of Environmental Protection [NYCDEP]) in tandem with the Phase I ESA for review and approval. As such, in accordance with Chapter 12, Section 300 of the *2014 CEQR Technical Manual*, with regulatory oversight provided by NYCDEP, a Phase II ESA Work Plan and this associated HASP have been prepared.

2.2 Scope of Work

Tasks to be performed at the subject property under this HASP include the installation of soil borings and the collection of soil samples, groundwater sampling, and a soil vapor investigation. More specifically, the Phase II ESA involves the following elements:

- Collection of soil samples down a maximum depth of 13 feet below grade surface (bgs).
- Groundwater sampling at the subject property.
- Collection of soil vapor samples to determine the potential presence of a VEC.

The drilling contractor will be responsible for the installation of soil borings throughout the site. The drilling contractor will be responsible to ensure that all materials introduced into the work area and all installation equipment will be environmentally suitable and does not contain potential contaminants.

VHB will be responsible for observing the aforementioned tasks, and for the collection of soil, groundwater and soil vapor samples.

In the event that contaminated soils and/or groundwater are encountered (i.e., if the presence of staining, sheens, odors or other physical evidence of contamination is noted) during the completion of the aforementioned tasks, work activities will be suspended and the VHB Project Manager will be notified. Site activities will then proceed only at the direction of the VHB Project Manager and/or the VHB Site Safety Officer. Care will be exercised during the continued work activities to mitigate the further movement of any contamination, and equipment will be periodically cleaned during appropriate work stages, as needed to prevent the spread of contaminants.

Activity-specific hazards associated with site operations and the standard operating procedures (SOPs) that will be implemented to reduce these hazards are discussed in Section 3.0 (Hazard Assessment) below.

3.0

Hazard Assessment

This Hazard Assessment identifies the activity-specific hazards associated with site operations and the SOPs that will be implemented to reduce the hazards. This section identifies general physical hazards that can be expected, and presents an analysis of documented or potential chemical hazards likely to be encountered at the site. Every effort will be made to reduce or eliminate these hazards. Hazards that cannot be eliminated must be managed through engineering controls and/or personal protective equipment.

3.1 Activity-Specific Hazards and Standard Operating Procedures

3.1.1 Operation of Heavy Equipment

OSHA guidelines will be followed for operating heavy equipment as outlined in 29 CFR 1926.602.

3.1.2 Excavation/Earthwork

According to the site-specific scope of work, excavation/earthwork will be limited to drilling and probing operations described in Section 3.1.4. Should a change in the scope of work include additional earthwork, an amendment to this HASP will be prepared. VHB follows the earthwork protocols described below.

The OSHA 29 CFR 1926.651 (February 20, 1990) established construction industry standards relating to excavation work. These standards include shoring and cutback requirements, equipment specifications, entry requirements, etc. To avoid exposure to site-specific contaminants and to ensure acceptable atmospheric conditions, the following additional requirements apply:

- Air quality will be tested before employees enter excavations over four feet deep if a hazardous atmosphere exists or is suspected to exist. If the Site Safety Officer determines that excavations are, by OSHA's definition, "confined space," the confined space entry policy (Section 8.0) will be followed.

- Open excavations will be backfilled as soon as practicable. While excavations remain open, appropriate warnings will be posted and barricades will be erected to protect pedestrian and worker safety. Where possible, excavation side walls will be cut at a gradual slope to maximize egress and access. Workers will not enter excavations unless absolutely required.

- To ensure atmospheric quality, tests shall be conducted as often as necessary as determined by the Site Safety Officer. This includes tests for flammable gas and oxygen deficiency.

- When the Site Safety Officer identifies hazardous atmospheres, emergency rescue equipment and PPE must be on the work site (Level C PPE) and readily accessible to employees (29 CFR 1926.651(g)(2)(i)).

- Daily site safety inspections will be conducted by the Site Safety Officer.

3.1.3 Work in Extreme Temperatures

Work under extremely hot or cold weather conditions requires special protocols to minimize the chance that employees will be affected by heat or cold stress. VHB follows the heat and cold stress safety protocols described in Attachment D.

3.1.4 Drilling, Probing and Excavation Operations

Drilling and probing are included in the site-specific scope of work. All drill operators and site personnel should wear, at a minimum, hard hats, steel-toe safety shoes or boots, gloves and safety glasses. Additional clothing and protective equipment may be required as determined by the Site Safety Officer. Clothing must be close fitting, without loose ends, straps, draw strings or belts or other unfastened parts that might catch on moving machinery.

VHB follows the additional drill rig operation safety protocols described in Attachment E.

3.1.5 Dust Control and Monitoring During Earthwork

Dust generated during site activities may contain contaminants associated with the site characteristics. VHB will have its subcontractors implement dust control measures, including

wetting of soils with water, and applying calcium chloride if the problem cannot be controlled with water. Air monitoring and dust control techniques are specified in a site-specific Dust Control Plan (if applicable). Site workers will not be required to wear APR's unless dust concentrations are consistently over 150 $\mu g/m^3$ in the breathing zone, (as measured by a dust monitor) unless the Site Safety Officer directs workers to wear APRs. The Site Safety Officer will use visible dust as an indicator to implement the dust control plan. The primary sources of dust will be equipment, vehicular traffic, and drilling activities.

3.2 General Site Hazards

Although not all of these hazards may be encountered at the site, employees should be aware of the potential of encountering these hazards during site work:

Fire

VHB will not perform or allow any act on the property which involves the creation of a fire or explosion hazard. Non sparking tools and fire extinguishers shall be used or available as appropriate. Sources of ignition shall be removed from work areas. When necessary, explosion proof instruments and/or bonding and grounding will be used.

Electricity

Applicable OSHA 29 CFR 1910.120(m) standards for illumination shall apply. All work is to be conducted during daylight hours whenever possible.

Overhead and underground utilities shall be identified and/or inspected prior to conducting operations involving potential contact or interference. As per OSHA 1910.333, for unqualified persons working on the ground near overhead energized lines, the minimum permissible distance requirements are as follows:

- For voltages to ground 50kV or below – 10 feet
- For voltages to ground over 50kV - 10 feet plus 4 inches for every 10kV over 50 kV

Live power sources will be locked and tagged out by authorized personnel. In these instances verification that power sources have been appropriately de-energized will be provided by Con Edison. All drilling equipment will be securely grounded when working within or around the electrical substation.

All electrical power to the work site must run through a ground fault circuit interrupter as an integral part of the circuit. All equipment must be suitable and approved for the class of hazard. Applicable OSHA 29 CFR 1926 Subpart K standards for electrical use shall apply.

Trip/Fall Hazards

Work, where a fall of over four feet is possible, will be performed by appropriately using ladders and/or fall protection (i.e. body harness, lifeline, and suitable anchorage).

As the proposed work activities may include sampling of UIC structures, the Site Safety Officer shall incorporate awareness of trip/fall hazards into the daily tailgate safety meetings and conduct periodic inspections of the site to identify potential trip/fall hazards. In addition, following the completion of the daily activities, the Site Safety Officers shall inspect the site for open UIC structures, excavations and other trip/fall hazards. If identified, the Site Safety Officer will be responsible for having these areas secured.

Poison Ivy

Although it is recommended that workers learn to recognize the poison ivy plant, in practice, it is hard to do, since poison ivy and its relatives are often mixed in with other vegetation and not noticed until after an exposure has occurred. Keeping the skin covered in situations in which exposure is hard to avoid is the best way to prevent the problem. Long pants and long sleeves will be worn while working in vegetated areas.

Ticks

Ticks like to rest on low-lying brush and 'catch a ride' on a passing animal or person. Workers should exercise caution when working in vegetated wilderness areas where ticks may be present. To reduce the chance of getting a tick-bite, workers should wear light-colored clothing and conduct frequent tick-checks. Light-colored clothing allows ticks to be seen more easily on clothing and gives the opportunity to remove them before they can attach to the skin and feed. As required above, long-sleeve shirt and long pants will also aid in the prevention of tick bites by reducing the amount of skin exposed to the ticks. Also, shirts should be tucked into the pants and pants legs tucked into the socks. This keeps the ticks on the outside of the clothing and restricts the tick's efforts to crawl onto the skin. Frequent tick-checks should be conducted which include a visual inspection of the clothing and exposed skin, followed by a naked, full-body examination in a private location. Workers should be sure to check the scalp, behind and in the ears, and behind any joints.

3.2.1 Miscellaneous Tasks

The following work tasks require specific SOPs and safety measures:

- site geophysical inspection
- work around heavy equipment (including drill rigs)
- soil excavation (drilling/probing)
- soil/ UIC sampling
- drum handling

The safety hazards associated with these and other work tasks and the SOPs followed by VHB are contained in Appendices E and F.

Should a change in the scope of the work activities include additional work tasks, an amendment to this HASP will be prepared.

3.3 Chemical Hazards

Based upon historic usage of the subject property, soils and groundwater containing, VOCs, SVOCs, metals, PCBs and/or pesticides at concentrations in contravention of applicable regulatory standards may be encountered during work activities. Accordingly, all drilling and sampling activities will be performed in Level D or Level C protection, as determined by the Site Safety Officer.

As described in Sections 3.3.2 and 5.1, air monitoring with a photoionization detector (PID) will be conducted by the Site Safety Officer during all drilling activities, in order to determine if organic vapor concentrations are present and exceed action levels. Although it is not anticipated, if air monitoring results indicate that work cannot proceed because of atmospheric conditions, the work will be stopped and an amendment to this HASP will be prepared to include procedures for engineering controls and increased levels of personal protection.

The following chemical hazards associated with heavy equipment operation may be expected at the site during work activities:

1. Diesel fuel
2. Hydraulic fluid
3. Alkaline and nickel-cadmium batteries
4. Gasoline

Copies of the MSDS for each of these chemicals are included in Attachment G.

In addition, based upon the historic site usage described previously, soils and groundwater containing, VOCs, SVOCs, metals, PCBs and/or pesticides at concentrations in contravention of applicable regulatory standards may be encountered during work activities.

Attachment G will be supplemented if additional site-specific chemicals are identified.

Potential routes of exposure of these materials include:

- Inhalation of airborne particulate and vapor
- Dermal contact
- Incidental ingestion

3.3.1 Respirable Dust

Dust may be generated from vehicular traffic, construction and/or excavation activities. If visible observation monitoring detects concentrations greater than 150 µg/m3 over daily background, the Site Safety Officer will take corrective actions as defined herein, including increasing the amount of water applied to the material and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges.

3.3.2 Organic Vapors

Excavation activities can cause the release of organic vapors to the atmosphere. The VHB Site Safety Officer will monitor organic vapors with a PID during all excavation and soil sampling activities involving contaminated or potentially-contaminated soils to determine whether organic vapor concentrations exceed action levels.

Additional information regarding air monitoring activities is included in Section 5.1, below.

4.0

Personal Protective Equipment

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, OSHA 29 CFR 1910.120(c), (g), and 1910.132. Protective equipment shall be NIOSH and/or ANSI-approved (as appropriate) and respiratory protection shall conform to OSHA 29 CFR Part 1910.133 and 1910.134 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136. The only significant difference among the levels of protection from D thru B is the addition of the type of respiratory protection.

4.1 Activity-Specific Levels of Personal Protection

The required level of PPE is specific to the activity being conducted, the contaminants expected to be encountered (Section 3.3), and may be based on air monitoring results (Section 5.0).

Based upon the historic site use and the nature of the work to be performed, the scope of work will be performed in Level D or Level C protection, as determined by the Site Safety Officer. Air monitoring with a PID will be conducted by the Site Safety Officer during all drilling activities, in order to determine if organic vapor concentrations are present and exceed action levels. The results will be monitored and recorded, in order to determine whether acceptable atmospheric conditions are being sustained. If determined necessary by the Safety Officer, air monitoring may be amended to also include the concentrations of oxygen (O_2), the concentrations of flammable gases with respect to the lower explosive limit (LEL) and the concentration of carbon monoxide (CO) and hydrogen sulfide (H_2S).

Although it is not anticipated, if air monitoring results indicate that work cannot proceed because of atmospheric conditions, the work will be stopped and an amendment to this HASP will be prepared to include procedures for engineering controls and increased levels of personal protection.

4.2 General PPE

4.2.1 Level D

Level D PPE shall be donned when the atmosphere contains no known hazards and work functions preclude splashes, immersion, or the potential for inhalation of, or contact with, hazardous concentrations of harmful chemicals. Level D PPE consists of:

- standard work uniform, coveralls, or tyvek, as needed
- steel toe and steel shank work boots
- hard hat
- gloves, as needed
- safety glasses
- hearing protection
- equipment replacements are available as needed

4.2.2 Level C

Level C PPE shall be donned when the concentrations of measured total organic vapors in the breathing zone exceed background concentrations (using a portable OVA, or equivalent), but are less than 5 ppm, or otherwise when required by SOPs or VHB's Respiratory Protection Policy. The specifications on the APR filters used must be appropriate for contaminants identified or expected to be encountered. Level C PPE shall be donned when the identified contaminants have adequate warning properties and criteria for using APR have been met. Level C PPE consists of:

- chemical resistant or coated tyvek coveralls
- steel-toe and steel-shank work boots
- chemical resistant overboots or disposable boot covers
- disposable inner gloves (surgical gloves)
- disposable outer gloves
- full-face APR fitted with organic vapor/dust and mist filters or filters appropriate for the identified or expected contaminants
- hard hat
- splash shield, as needed
- ankles/wrists taped with duct tape

The Site Safety Officer will verify if Level C is appropriate by checking organic vapor concentrations using a PID or compound and/or class-specific detector tubes.

4.2.3 Level B

Level B PPE shall be donned when the contaminants have not been identified and/or the concentrations of unknown measured total organic vapors in the breathing zone exceed 5 ppm (using a portable OVA, or equivalent). Level B PPE shall be donned if the IDLH of a known contaminant is exceeded. If a contaminant is identified or is expected to be encountered for which NIOSH and/or OSHA recommend the use of a positive pressure self-contained breathing apparatus (SCBA) when that contaminant is present, Level B PPE shall be donned even though the total organic vapors in the breathing zone may not exceed 5 ppm. Level B shall be donned for confined space entry, and when the atmosphere is oxygen deficient (oxygen less than 19.5%) or potentially oxygen deficient. If Level B PPE is required for a task, at least three people shall be donned in Level B at any one time during that task. PPE shall only be donned at the direction of the Site Safety Officer. Level B PPE consists of:

- supplied air SCBA or air line system with five minute egress system
- chemical resistant coveralls
- steel-toe and steel-shank work boots
- chemical resistant overboots or disposable boot covers
- disposable inner gloves
- disposable outer gloves
- hard hat
- ankles/wrists taped

The exact PPE ensemble is decided on a site-by-site basis by the VHB Site Safety Officer with the intent to provide the most protective and efficient worker PPE.

5.0

Air Monitoring and Action Levels

Pursuant to 29 CFR 1910.120(h), air monitoring shall be conducted to identify and quantify levels of airborne hazardous substances and health hazards, and to determine the appropriate level of worker protection.

5.1 Air Monitoring Requirements

Based upon current and former site uses of the subject property and the nature of the work to be performed, air monitoring will be conducted by the Site Safety Officer during all drilling activities. Monitoring will be conducted using direct-reading instruments to evaluate the conditions in the work area. Based on current knowledge of the work operations and potential site conditions, the testing will be conducted using the following instrument:

- A PID calibrated to detect of Volatile Organic Compound (VOCs) at a minimum concentration of 0.1 part per million (ppm). The PID will be used during all drilling and soil/groundwater sampling activities.

If determined necessary by the Site Safety Officer, air monitoring may be amended to also include the following instrument:

- Four Gas Meter (0_2/LEL/CO/H2S) or equivalent, to determine the concentrations of oxygen (O_2), the concentrations of flammable gases with respect to the lower explosive limit (LEL) and the concentration of carbon monoxide (CO) and hydrogen sulfide (H_2S). The PID will be used during all drilling and soil/groundwater sampling activities, if determined necessary by the Site Safety Officer.

All air monitoring data will be documented in a site logbook. Air monitoring instruments will be calibrated and maintained by the VHB Site Safety Officer in accordance with the manufacturer's specifications. When tasks are performed, the concentration of contaminants (for example, VOCs) shall be measured in employees' breathing zones several times during the task using the direct reading instrument. The specific frequency of the monitoring shall vary with the task to be performed; more frequently during operations having a greater potential for exposure.

Measurements with the PID and Four Gas Meter will also be taken prior to personnel entering a confined space, however, based upon the site-specific scope of work, confined space entries will not be necessary. Should the scope of work be amended to include confined space entry, an amendment to this HASP will be prepared.

5.2 Air Monitoring Results and Actions

The results of the air monitoring and sampling will be compared, for most stressors, to applicable OSHA Permissible Exposure Limits (PELs). The following table identifies applicable OSHA criteria and the action levels used to make decisions about changing the requirements for personal protective equipment.

Stressor	OSHA PEL	Action Level
Flammable Gases	0 – 1% of the LEL	Work continues
	1 – 10% of the LEL	Work continues; increase monitoring frequency
	> 10% of the LEL	Work stops
Oxygen	<19%	Leave area immediately
	19 – 23.5%	Work continues
	> 23.5%	Work stops; ventilate area before returning.
VOCs	1 ppm sustained for 5 min.	Screen for benzene using Draeger tubes
	10 ppm sustained for 5 min.	Work stops; ventilate area before returning.
	10 ppm sustained for 30 min.	Upgrade to Level C.
Carbon Monoxide	35 ppm	25 ppm - Leave area and ventilate
Hydrogen Sulfide	10 ppm	10 ppm - Leave area and ventilate

Although it is not anticipated, if air monitoring results indicate that work cannot proceed because of atmospheric conditions, the work will be stopped and an amendment to this HASP will be prepared to include procedures for engineering controls and increased levels of personal protection.

6.0
Site Control

6.1 Work Zones

The primary purpose of site controls is to establish the perimeter of a hazardous area, to reduce the migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. When operations are to take place involving hazardous materials, the Site Safety Officer will establish an exclusion zone, a decontamination zone, and a support zone. These zones "float" (move around the site) depending on the tasks being performed on any given day. The Site Safety Officer will outline these locations before work begins and when zones change. The Site Safety Officer records this information in the site log book.

Tasks requiring OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training are carried out in the exclusion zone. The exclusion zone is defined by the Site Safety Officer but will typically be a 50-foot area around work activities. Gross decontamination (as determined by the Site Safety Officer) is conducted in the exclusion zone; all other decontamination is performed in the decontamination zone or trailer.

Protective equipment is removed in the decontamination zone. Disposable protective equipment is stored in receptacles staged in the decontamination zone, and non-disposable equipment is decontaminated according to the procedures outlined in Section 7.0. All personnel and equipment shall exit the exclusion zone through the decontamination zone. If a decontamination trailer is provided the first aid equipment, an eye wash unit, and drinking water are kept in the decontamination trailer.

The support zone is used for vehicle parking, daily safety meetings, and supply storage. Eating, drinking, and smoking are permitted only in the support zone. When a decontamination trailer is not provided, the eye wash unit, first aid equipment, and drinking water are kept at a central location designated by the Site Safety Officer.

6.2 General Field Safety and Standard Operating Procedures

VHB's policy is to control hazards at all site areas by limiting entrance to exclusion zones to essential personnel and by implementing the following rules:

- Non-essential (as judged by the Site Safety Officer) personnel and unauthorized persons will not enter the exclusion or decontamination zone.

- Before entering the exclusion or decontamination zones, all personnel must be familiar with emergency response procedures (Section 9.0), site safety locations, first aid and communication equipment, and the location of the map to the hospital and the list of emergency telephone numbers.

- The buddy system will be used at all times by field personnel in the exclusion zone; no one is to perform work within the exclusion zone alone. When in Level D or C, visual contact or radio contact shall be maintained at all times. In Level B, visual contact shall be maintained at all times, and radio contact shall be maintained with the decontamination and/or support zone.

- Contact with contaminated and potentially contaminated surfaces should be avoided. Walk around (not through) puddles and discolored surfaces. Do not kneel on the ground or place equipment on the ground. Protect equipment from contamination.

- All personnel exiting the exclusion zone must exercise the decontamination procedures described in Section 7.0 of this HASP.

- Beards or other facial hair that interferes with respirator fit will preclude admission to the exclusion zone. Contact lenses shall not be worn in the exclusion or decontamination zones, or if the worker may be expected to enter these zones under routine or emergency situations.

- Eating, drinking, or smoking is permitted only in designated areas in the support zone.

- Each worker must be supplied with and maintain his/her own personal protective equipment.

Note: These policies will be enforced by the designated Site Safety Officer.

7.0

Decontamination Procedures

Prior to the start of the field activities, the Site Safety Officer will be responsible for the designation of the work zone, support zone, and clean zone. The work zone will be an area surrounding the immediate work being performed where the greatest potential hazards exist. Only the necessary workers required to perform the work will be permitted in this zone. A support zone will be established for the storage of equipment and personnel decontamination. A clean zone will be established for site control of visitors, equipment deliveries, and communications.

In general, everything that may come in contact with contaminated media must either be decontaminated or discarded prior to exit. In addition to worker protection, care must be taken to avoid cross-contamination of samples and other facility areas.

All support and sampling equipment which has or may have contacted contaminated materials will be cleaned with detergent/water solution and rinsed with water in wash tubs or buckets. The wash water, rinse water and residues will be collected and properly stored until sampling results are received and final disposition of the waste can be determined. Monitoring equipment that comes into will be decontaminated according to manufacturer specifications. Decontamination is done in the exclusion or decontamination zones. Rented equipment is photographed after decontamination.

Disposable PPE and equipment will be properly bagged and disposed of.

Employees will wash their hands and faces with detergent and water prior to eating or smoking. Smoking will not be permitted in the work and support zones.

The minimum measures for Level B doffing and decontamination are:

- deposit equipment on plastic drop cloths.
- scrub outer boots and gloves with a water and detergent solution and rinse.
- remove outer boots and outer gloves. Discard disposable outer garments in receptacle provided.
- remove SCBA and face piece and place on rack provided
- remove tyvek/outer garment and place in receptacle provided
- remove inner gloves and deposit in receptacle provided

- shower/wash face and hands

The minimum measures for Level C doffing and decontamination are:

- deposit equipment on plastic drop cloths.
- scrub outer boots and gloves (if worn) with a water and detergent solution and rinse.
- remove outer boots and outer gloves. Discard disposable outer garments in receptacle provided.
- remove tyvek/outer garment and place in receptacle provided.
- remove first pair of inner gloves
- remove respirator (using "clean" inner gloves) and place on rack provided
- remove last pair of inner gloves and deposit in receptacle provided
- shower/wash face and hands

The second to last item to be removed is the APR, and the last item to be removed is the last of several pairs of surgical gloves. Wearing several pairs of inner gloves permits layers to be removed as needed during various stages of the doffing procedure, and if the APR inadvertently becomes contaminated, inner gloves guard against bare hands contacting the APR.

8.0
Confined Space

According to OSHA 29 CFR 1910.146, a confined space is a space which is large enough and so configured that an employee can bodily enter and perform assigned work, has limited or restricted means for entry or exit, and is not designed for employee occupancy. Based upon the site-specific scope of work, confined space entries will not be necessary. However, should the scope of work be amended to include confined space entry, an amendment to this HASP will be prepared. The following protocol will when VHB employees must enter a confined space:

- The Site Safety Officer evaluates the space and site conditions to determine whether the space must be considered "confined".
- If so, the Site Safety Officer monitors the space for hazardous atmospheres prior to entry and fills out a pre-entry checklist (Attachment H) to determine whether an entry-permit is required.
- If there is no hazardous atmosphere, the space will be continuously monitored during the entry to assure that the atmosphere remains non-hazardous.
- If the space contains a hazardous atmosphere, an entry permit (Attachment H) will be prepared and the space will only be entered in accordance with 29 CFR 1910.146.

8.1 Rescue and Emergency Services

When practical, non-entry rescue is the preferred method of rescue, even for horizontal entries. To help permit-required confined space non-entry rescue, each authorized entrant will use a full body or chest harness with a retrieval line attached to a mechanical device or fixed point outside the permit-required confined space. Mechanical devices to retrieve personnel will be used for vertical spaces more than five feet deep.

8.1.1 On-Site Rescue Services

Qualified personnel will be available on-site to conduct confined space entry rescue, if needed. All essential equipment (SCBA/air lines, hoist, etc.) needed to effect rescue will also be staged on-site during all confined space activities. Rescue personnel will extract the confined space worker to the nearest available safe location so that emergency first aid may be performed. In the event of a confined space rescue, the Attendant will be responsible to notify First Responder Medical Care, the Site Safety Officer, and the Project Manager immediately.

8.1.2 Subcontractor Entry Operations

Based on the site-specific scope of work, subcontractor personnel will not have to enter confined spaces. However, in the event that completing the work requires subcontractor personnel to enter a confined space, entry will only be made by personnel who have received the training required to correctly perform their assigned duties.

9.0

Contingency Plan/Emergency Response Plan

It is essential that site personnel be prepared for an emergency. Emergencies can take many forms; sudden illnesses or injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

A list of emergency telephone numbers and hospital travel routes to the nearest hospital with an emergency capacity will be posted on site in the field vehicle. Site personnel must be familiar with the emergency incident procedures, and the locations of site safety, first aid, and communication equipment.

9.1 Emergency Equipment On-Site

Private Telephones:	Site Personnel
Two-way Radios	Site Personnel (where necessary)
Emergency Alarms:	On-site vehicle horns*
First Aid Kits:	On-site vehicle/heavy equipment
Fire Extinguisher:	On-site vehicle/heavy equipment

*Horns – Air Horns will be supplied to personnel at the discretion of the Project Manager or Site Safety Officer.

9.2 Emergency Telephone Numbers and Hospital Information

Emergency telephone numbers and routes to the nearest hospital with an emergency capacity are as follows:

General Emergencies: 911

NYPD – 73rd Precinct	911 for emergency or 1-718-495-5411
FDNY:	911
First Responder Medical Care:	911
National Response Center	1-800-424-8802
NYC Regional Poison Control Center	1-800-222-1222
NYS Spill Hotline:	1-800-457-7362
National Response Center:	1-800-424-8802
NYCDEP Hotline:	311 (in NYC); Otherwise (212) 639-9675
Project Manager - Bryan Murty	1-212-857-7350 or 1-631-655-9373
SSO – Bryan Murty	1-212-857-7350 or 1-631-655-9373
Alternate SSO – Stephen Kaplan	1-631-787-3400 or 1-631-316-4892

For Non-Emergency Care – (Emergencies must call 911)

Nearest Hospital: Brookdale University Hospital Medical Center
1 Brookdale Plaza
Brooklyn, New York 11212
1-718-240-5000

Directions to Brookdale University Hospital Medical Center (Approximately 1.4 miles from the site):

Head north on Chester Street Avenue and turn left onto East New York Avenue. Continue for 0.2 mile and turn left onto Amboy Street. Continue for 0.5 mile and turn right onto Dumont Avenue. Continue for 522 feet and turn left onto Strauss Street. Continue for 0.5 mile and turn left onto East 98th Street. Continue for 425 feet and arrive at Brookdale University Hospital Medical Center.

A map showing the route to the nearest hospital is provided in Appendix A, Figure 2.

The emergency telephone numbers and hospital route presented above are also included in Attachment I.

9.3 Personnel Responsibilities During an Emergency

As the administrator of the project, the Project Manager has primary responsibility for responding to and correcting emergency situations. In the absence of the Project Manager, the senior person on-site (e.g., the Site Safety Officer) shall act as the Project Manager's on-site designee. Their responsibilities include:

- Take appropriate measures to protect personnel including: evacuating and securing the site or up-grading or down-grading the level of protective clothing and respiratory protection.

- Ensure that the client and appropriate Federal, State and local agencies are informed, and emergency response plans are coordinated; in the event of fire or explosion, the local fire department should be summoned immediately. In the event of an air release of toxic materials, the local authorities and client must be informed in order to assess the need for evacuation. In the event of spill or on-land release of hazardous or toxic materials, the Project Manager will be contacted immediately. The Project Manager will contact the client to determine reporting requirements to the appropriate agency.

- Ensure appropriate decontamination treatment or testing for exposed or injured personnel.

- If possible, determine the cause of the incident and make recommendations to prevent recurrence.

- Ensure that all required reports which may be required by the client and/or regulatory agencies have been prepared and filed.

9.4 Medical Emergencies

Any on-site person who becomes ill or injured must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid (if a qualified and trained provider is part of the field team) administered prior to transport. First aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (Attachment I) must be filled out for any injury.

Any person transporting an injured/exposed person to the hospital for treatment should follow the route to Brookdale University Hospital Medical Center (Approximately 1.4 miles from the site):

> **Head north on Chester Street Avenue and turn left onto East New York Avenue. Continue for 0.2 mile and turn left onto Amboy Street. Continue for 0.5 mile and turn right onto Dumont Avenue. Continue for 522 feet and turn left onto Strauss Street. Continue for 0.5 mile and turn left onto East 98th Street. Continue for 425 feet and arrive at Brookdale University Hospital Medical Center.**

A map showing the route to the nearest hospital is provided in Attachment A, Figure 2.

9.5 Fire or Explosion

In the event of a fire or explosion, the fire department should be summoned immediately. Upon their arrival, the senior staff on-site will advise the fire commander of the location and nature of on-site hazardous materials that the senior staff is aware of. If it is safe to do so, site personnel may:

- Use firefighting equipment available on site.
- Remove or isolate flammable or other hazardous materials that may contribute to the fire.

9.6 Evacuation Routes

Evacuation routes established by work area locations for each site will be reviewed prior to commencing site operations. As the work areas change, the evacuation routes will be altered accordingly, and the new route will be reviewed.

Under extreme emergency conditions, evacuation is to be immediate without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel will follow these instructions:

- Keep upwind of smoke, vapors, or spill location.
- Exit through the decontamination corridor if possible.
- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.
- The Site Safety Officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.
- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

9.7 Spill Control Procedures

In the event of a leak or a release, site personnel will:

Inform their supervisor immediately.
Locate the source of the spillage and stop the flow if it can be done safely.
Begin containment and recovery of the spilled materials.

Subcontractors utilizing heavy equipment will be responsible for maintaining containment equipment, emergency spill kits and oil booms in the immediate vicinity of the work site to address any release of diesel or hydraulic fluid from the equipment.

In the event of a leak or a release, site personnel will immediately inform the Project Manager. The Project Manager will immediately notify the client. Within 24 hours of this verbal notification, the Project Manager will provide the client with a written report. The report will include the events that transpired and any action taken by VHB to protect health and safety as well as the environment. The report will list all those who were notified of the release.

Attachment A
Figures

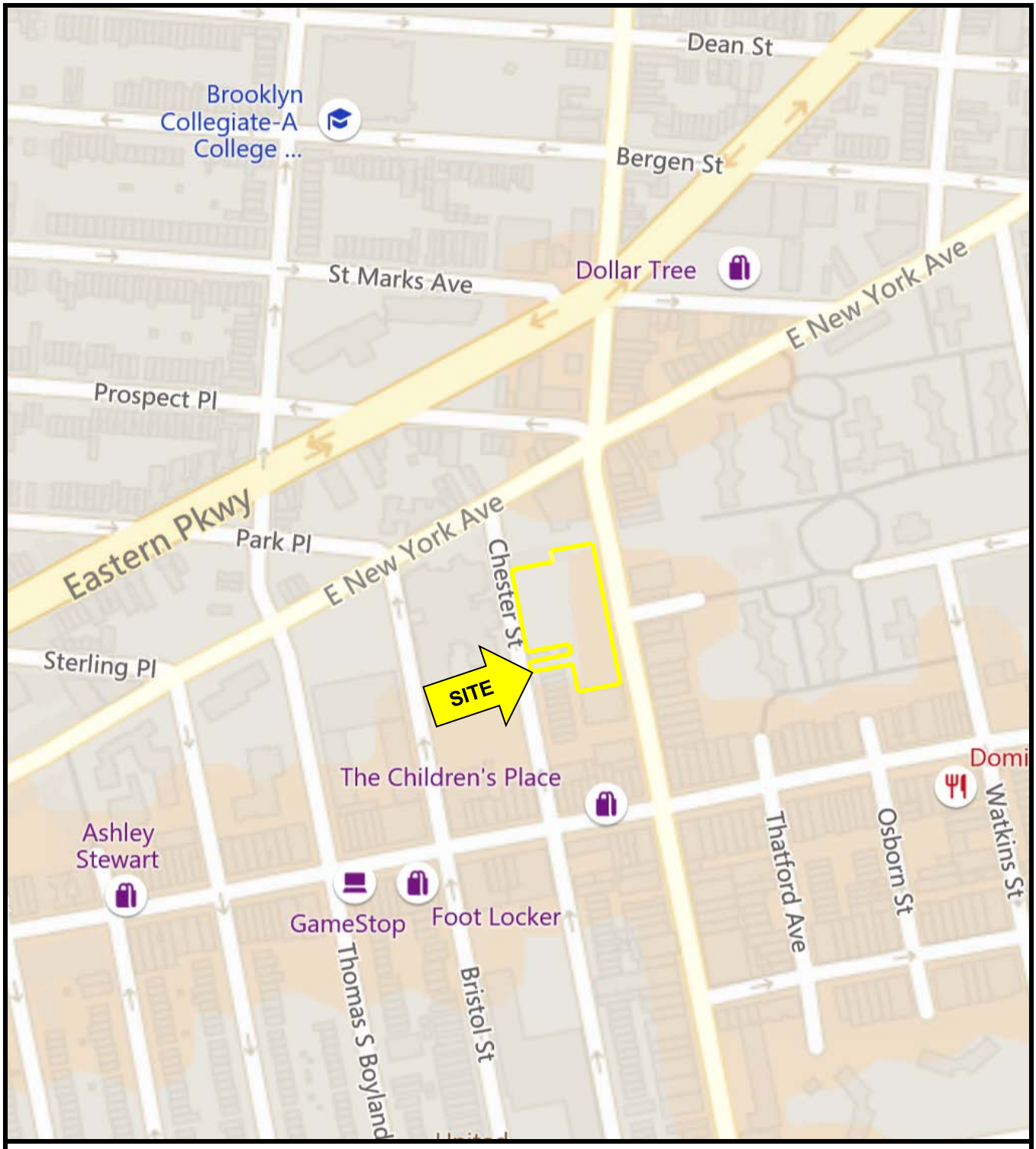


FIGURE 1 – SITE LOCATION MAP

SITE NAME: Blue Sea - Brownville
MUNICIPALITY, STATE, ZIP: Brooklyn, New York 11212
PROJECT NUMBER: 26979.00
SOURCE: Bing Maps, 2019

PROJECT NORTH

vhb

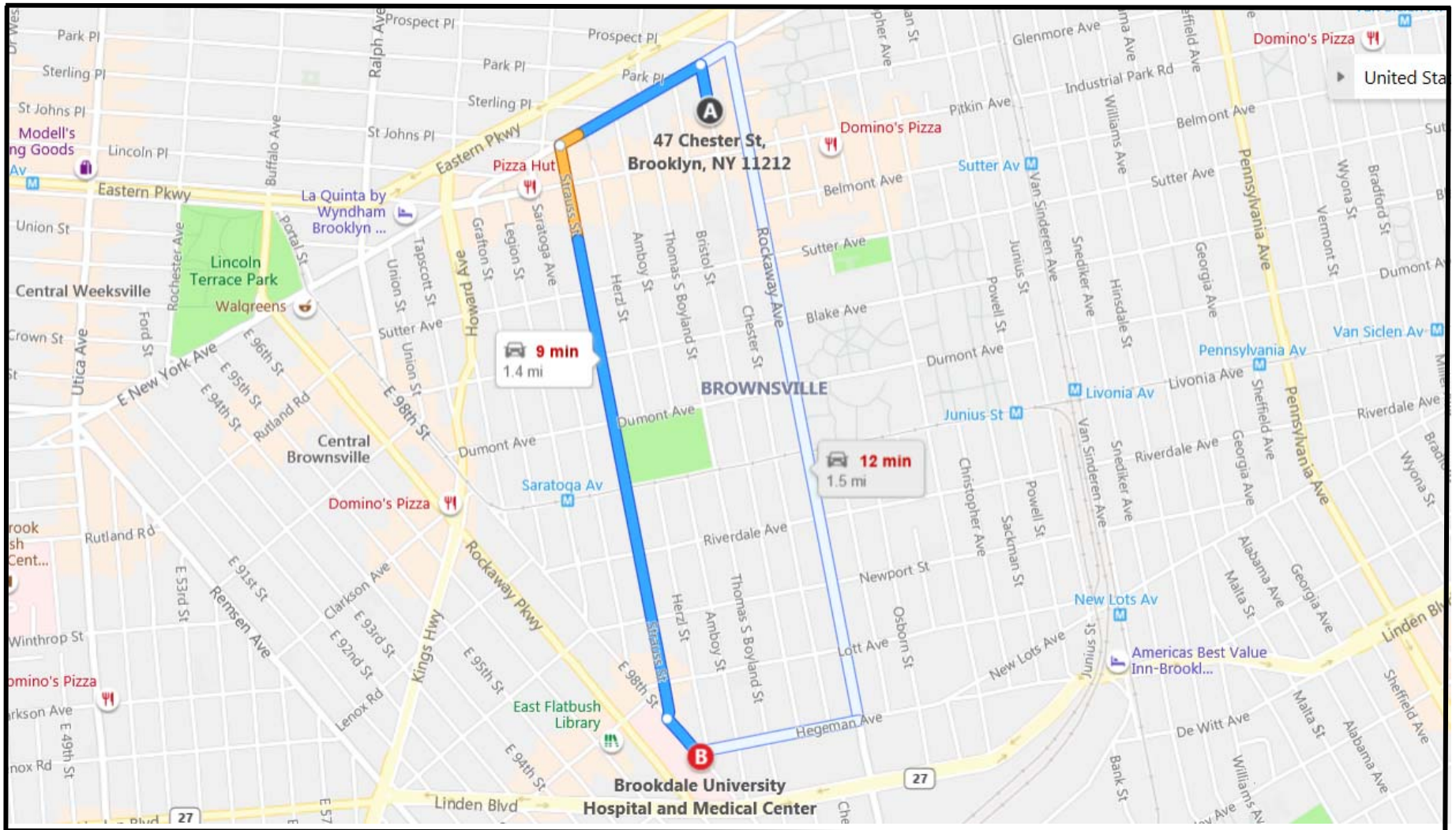


FIGURE 2 - ROUTE TO HOSPITAL

SITE NAME: Vacant Parcels
ADDRESS Rockaway Avenue & Chester Street
CITY, STATE, ZIP: Brooklyn, New York 11218
PROJECT NUMBER: 26645.00
SOURCE: Bing, 2019

Attachment B
Site Safety Plan Acknowledgement Form

SITE SAFETY PLAN ACKNOWLEDGMENT FORM

I have been informed and understand the procedures set forth in the Safety and Health Plan/Site Safety Plan:

Printed Name	Signature	Representing	Date

SITE SAFETY PLAN ACKNOWLEDGMENT FORM

I have been informed and understand the procedures set forth in the Safety and Health Plan/Site Safety Plan:

Printed Name	Signature	Representing	Date

SITE SAFETY PLAN ACKNOWLEDGMENT FORM

I have been informed and understand the procedures set forth in the Safety and Health Plan/Site Safety Plan:

Printed Name	Signature	Representing	Date

SITE SAFETY PLAN ACKNOWLEDGMENT FORM

I have been informed and understand the procedures set forth in the Safety and Health Plan/Site Safety Plan:

Printed Name	Signature	Representing	Date

SITE SAFETY PLAN ACKNOWLEDGMENT FORM

I have been informed and understand the procedures set forth in the Safety and Health Plan/Site Safety Plan:

Printed Name	Signature	Representing	Date

SITE SAFETY PLAN ACKNOWLEDGMENT FORM

I have been informed and understand the procedures set forth in the Safety and Health Plan/Site Safety Plan:

Printed Name	Signature	Representing	Date

Attachment C
Site Safety Plan Amendments

SITE SAFETY PLAN AMENDMENT #____:

A Site Safety Plan Acknowledgement Form must be signed by the site personnel for each Site Safety Plan Amendment.

SITE NAME: Vacant Parcels – Rockaway Avenue & Chester Street, Brooklyn, NY

REASON FOR AMENDMENT:

_____
_____
_____

ALTERNATE PROCEDURES:

_____
_____
_____
_____

REQUIRED CHANGES IN PPE:

_____
_____
_____

_____ _____
PROJECT MANAGER (DATE)

_____ _____
SITE SAFETY OFFICER (DATE)

_____ _____
TECHNICAL SAFETY MANAGER (DATE)

Attachment D
Heat/Cold Stress Protocols

HEAT RELATED EMERGENCIES

Good judgment is essential. Pace yourself by knowing your limitations. Avoid over exertion. You are your best gauge for heat related emergencies.

HEAT EXPOSURE

The human body stubbornly defends its constant core temperature of 98.6°F. To maintain this constant temperature, heat loss must equal heat gain. If heat loss exceeds heat gain, the body temperature will fall; conversely, if heat production exceeds heat loss, the temperature will rise. In a heat related emergency, the body's mechanisms for temperature regulation are overwhelmed. The body can no longer regulate core temperature, and the core temperature begins to rise. As this rise occurs, the body will begin to show the signs and symptoms of heat related stress. The sequence of illness may start with heat Cramps and progress into a more severe case or may go straight to Heat Stroke. The degree of illness will vary from person to person, depending on the nature of the exposure, physical conditioning and inherited traits.

PREVENTION

General

- While not mandated by corporate requirements, employees should attempt to maintain good physical conditioning and control blood pressure (avoid weight gain, smoking, etc.).
- Eat regularly and properly. Increase salt intake through food consumption during the hot season or hot spells and avoid the use of salt tablets, if possible.
- Avoid alcohol intake the night before if you are going to be working in hot environments, either from ambient conditions or by wearing Chemical Protective Clothing.
- If you are on medication or have a chronic medical history, consult a physician prior to working in a high temperature environment.

On-Site/Scene

- Sufficient quantities of water (at least 2 to 4 ounces of water prior to commencing work and during every rest period) should be consumed to help avoid heat related emergencies. A recommended alternative to water is an electrolyte drink split 50/50 with water

HEAT RELATED EMERGENCIES
SIGNS AND SYMPTOMS

EMERGENCY CARE

Heat Rash

Also known as prickly heat, this is a condition affecting the skin. The condition occurs in situations where the skin remains wet most of the time. The sweat ducts become plugged, and a skin rash soon appears.

Signs and Symptoms

1. Skin rash over affected areas of the body.
2. Tingling or prickling sensation on the affected areas.

Emergency Care

1. Take shower after working in heat.
2. Dry the skin thoroughly.
3. Change underwear as needed.
4. Stay in cool place after work hours.
5. Adjust clothing to wear materials that wick moisture away from body (cotton or Gore-Tex, etc.).

Heat Cramps

Heat cramps are muscle pains, usually in the lower extremities, the abdomen, or both, which occur secondary to profuse sweating with accompanying salt depletion. Heat cramps most often afflict people in good physical condition, who overwork in conditions of high temperature and humidity. Untreated, heat cramps may progress to heat exhaustion.

Treatment of heat cramps is aimed at eliminating the exposure and restoring the loss of salt and water.

Signs and Symptoms

1. Cramps in the extremities and abdomen which come on suddenly during vigorous activity. Heat cramps can be mild with only slight abdominal cramping and tingling in the extremities, but more commonly present intense and incapacitating pain in the abdomen and extremities.
2. Respiration rate will increase, decreasing after the pain subsides.
3. Pulse rate will increase.
4. Skin will be pale and moist.
5. Body temperature will be normal.
6. Loss of consciousness or airway maintenance are seldom problems with this condition.

7. Generalized weakness will be noted as the pain subsides.

Emergency Care

1. Move the worker to a cool environment. Have the worker lie down if the worker feels faint.
2. If the worker is not nauseated, the worker may be given 1 or 2 glasses of an electrolyte solution. Have the worker drink slowly. The use of salt tablets is not recommended, as they may precipitate nausea.
3. If the worker is nauseated, avoid giving anything by mouth until the nausea subsides.
4. Avoid massaging the cramping muscles. This rarely helps and may actually aggravate the pain.
5. As the salt and water level is replenished, the worker's pain will subside. The Worker may wish to return to work, however, this is NOT recommended for a period of 12 hours. Further exertion may lead to heat exhaustion or heat stroke.

HEAT EXHAUSTION

Heat exhaustion represents a somewhat more severe response to salt and water loss, as well as an initial disturbance in the body's heat-regulating system. Like heat cramps, heat exhaustion tends to occur in persons working in hot environments. Heat exhaustion is likely in dehydrated and hypertensive people. Untreated Heat Exhaustion may progress to Heat Stroke.

Treatment of heat exhaustion is similar in principle to that of heat cramps.

Signs and Symptoms

1. Heat Exhaustion may come on suddenly or may be felt as headache, fatigue, dizziness, and nausea with occasional abdominal cramping.
2. Sweating will be profuse.
3. Pulse will be rapid and weak.
4. Respiration rate will be rapid and shallow.
5. The skin will be pale and clammy.
6. The body temperature will be normal or decreased.
7. The worker could be irritable and restless.

Emergency Care

1. Move the worker to a cool environment, take off as much of the worker’s clothing as possible, and place the worker in a supine position with the worker’s legs elevated.

2. Sponge the worker with cool water. If you fan the worker, avoid chilling. When the body chills, the muscles generate energy. When the body shivers, this energy is released as heat and actually can increase the body temperature.
3. If this is a true medical emergency, prompt intervention by Emergency Medical Services is recommended.
4. Monitor the worker's level of consciousness and airway.

HEAT STROKE

Heat Stroke is caused by a severe disturbance in the body's heat-regulating mechanism and is a profound emergency, with a mortality rate ranging from 25 to 50 percent. It is most common in men over 40, especially in alcoholics. It can also occur in people of any age having too much exposure to the sun or prolonged confinement in a hot atmosphere. Heat stroke comes on suddenly. As the sweating mechanism fails, the body temperature begins to rise precipitously, reaching 106°F (41°C) or higher within 10 to 15 minutes. If the situation is not corrected rapidly, the body cells - especially the very vulnerable cells of the brain - are literally cooked, and irreversible central nervous system damage occurs.

The treatment for Heat Stroke is aimed at maintaining vital functions and causing as rapid a temperature fall as possible.

Signs and Symptoms

1. The worker's pulse will be strong and pounding.
2. The skin will be hot, dry and flushed.
3. The worker may experience headache, dizziness, and dryness of mouth.
4. Seizures and coma occur.
5. Loss of consciousness and airway maintenance problems can occur.

Emergency Care

1. Establish an open airway.
2. Move the worker to a cool environment. Take off as much clothing as possible, and place the worker in a semi-reclining position with the head elevated.
3. Use any means to cool the worker. Improvise with whatever is available. A bathtub filled with cold water and ice cubes is ideal. Remember, speed is essential; delay may result in permanent brain damage. Vigorous efforts to cool the worker must continue until the body temperature is below 103°F (38.9°C).
4. This is a true medical emergency; prompt intervention by Emergency Medical Services is required.

These are only guidelines for the care of Heat Related Emergencies. Actual training in emergency medical care or basic first aid is recommended.

HEAT STRESS

1. Heart rate (HR) should be monitored by the radial pulse for 30 seconds as soon as possible in the resting period.

   If at the beginning of the rest period a worker's radial pulse is measured and his heart rate exceeds 100 beats per minute, the worker's next work period should be reduced by 33%. Therefore, if the original work period was one hour, the following work cycle should be reduced to 40 minutes.

2. Administering salt tablets to prevent heat stress is not recommended due to a number of reasons: (a) sweat is hypotonic, therefore, adding salt to the body would only increase the body's need for water; (b) additional salt may interfere with a worker's predisposed physical condition (i.e., high blood pressure); and (c) increasing the sodium content in the body may cause an imbalance in the body's potassium content. Unless a physician recommends the use of salt tablets, individuals naturally obtain the necessary salt in their normal diet.

3. Heat Stroke is a true medical emergency. First aid should be directed toward immediate measures to cool the body quickly, as well as seeing that the victim receives medical attention as soon as possible.

   Prior to medical treatment, remove as much clothing as possible and proceed to cool the victim's body, taking care not to overchill the victim once his temperature falls below 102°F. One of the following cooling measures should be taken: (1) sponge the bare skin with cool water; (b) apply cold packs continuously; (c) wrap the victim in a sheet soaked with water; or (d) immerse the victim in a tub of cold water, while closely monitoring the victim's level of consciousness.

4. Prior to site activity, the field team leader will make arrangements for heat stress monitoring (i.e., monitoring heart rate, body temperature and body water loss) during actual site work if conditions warrant these measures. In addition, the worker would want to ensure that the team members have been acclimatized to the particular environmental conditions and that personnel are aware of the signs and symptoms of heat illness and have been adequately trained in first aid procedures. As field team leader, one could also make sure there is sufficient personnel on site, so as to rotate work assignments, schedule work during hours of reduced temperatures, and ensure personnel drink moderate levels of an electrolyte solution and eat well prior to commencing site work.

5. The worker could be experiencing a condition of heat rash. Allow workers to rest and relieve the itching associated with heat rash rather than return to work too soon. Itching workers may not follow stringent decon procedures or risk cross contamination.

   Keeping the skin clean and dry will reduce the incidence of heat rash. This can be accomplished by adjusting clothing to wear materials that wick moisture away from the body (cotton, Gore-Tex or other similar materials) underneath protective clothing. Upon removal of the protective clothing, the worker should wash and dry his skin thoroughly.

6. The sense of thirst is not an adequate regulator of water replacement during heat exposure. Therefore, as a general rule, the amount of water administered should replace the amount of water lost, and it should be administered at regular intervals throughout the day. It is not practical to measure water loss in the field; however, water should be replaced by drinking 2-4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink split 50/50 with water.

7. Although there is no specific test given during a baseline physical that would identify a person's tolerance to heat, there are physical factors and personal habits which may indicate possible intolerance to heat, such as, whether or not an individual smokes, one's dietary habit, body weight, as well as predisposed physical conditions such as high blood pressure, heart conditions, diabetes, or medication, that may influence an individual's ability to tolerate excessive heat.

8. First aid treatment: remove victim to a cool place and give sips of salted water (1 teaspoon of salt to 1 quart of water) - 4 ounces every 15 minutes over a period of one hour. A commercial preparation, e.g., Gatorade, may be used if split 50/50 with water.

The salted water or solution should mitigate the cramps. Manual pressure should not be applied to the cramped muscles.

TABLE C-1[1]

REQUIRED FREQUENCY OF HEAT STRESS MONITORING
FOR WORKERS IN IMPERMEABLE CLOTHING

Adjusted[2] Temperature (°F)	Work Time Allowed Before Monitoring Break (min.)
90 or above	15
87.5-90	30
82.5-87.5	60
77.5-82.5	90
72.5-77.5	120

(1) Adapted from Eastern Research Group and National Institute for Occupational Safety and Health, Occupational Safety and Health Guidance Manual for Super Activities. September 26, 1984, pp. 8-75.

(2) Calculate the adjusted air temperature (Ta adj) by using this equation:

$$\text{Ta adj °F} = \text{Ta °F} + (13 \times \% \text{ sunshine})$$

Measure air temperature (Ta) with a standard thermometer, with the bulb shielded from radiant heat. Then estimate percent sunshine (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows).

TABLE C-2

Heat Stress Indicator	When to Measure	If Exceeds . . .	Action
heart rate (pulse)	beginning of rest period	110 beats per minute	shorten next work period by 33%
oral temperature	beginning of rest period	99°F (after thermometer is under tongue for 3 minutes)	shorten next work period by 33%
		100.6°F	prohibit work in impermeable clothing
body weight	1. before workday begins (a.m.) 2. after workday ends (p.m.)		increase fluid intake

COLD STRESS (HYPOTHERMIA)

Cold stress is a function of cold, wetness and wind. A worker's susceptibility to cold stress can vary according to his/her physical fitness, degree of acclimatization to cold weather, age, and diet.

Prevention

Institute the following steps to prevent overexposure of workers to cold:

1. Maintain body core temperature at 96.8°F or above by encouraging workers to drink warm liquids during breaks (preferably not coffee) and wear several layers of clothing. Wool is recommended since it can keep the body warm even when the wool is wet.

2. Avoid frostbite by adequately covering hands, feet, and other extremities. Clothing such as insulated gloves or mittens, earmuffs, and hat liners should be worn. To prevent contact frostbite (from touching metal and cold surfaces below 20°F), workers should wear anti-contact gloves. Tool handles and control bars should be covered with insulating material.

3. Adjust work schedules if necessary, providing adequate rest periods. When feasible, rotate personnel and perform work during the warmer hours of the day.

4. Provide a heated enclosure for workers close to their work area. Workers should remove their outer layer(s) of clothing while in the shelter to allow for sweat evaporation.

5. In the event that wind barriers are constructed around an intrusive operation (such as drilling), the enclosure must be properly vented to prevent the build-up of toxic or explosive gasses or vapors. Care must be taken to keep any heat source away from flammable substances.

6. Using a wind chill chart such as the one in Table C-4, obtain the equivalent chill temperature (ECT) based on actual wind speed and temperature. Refer to the ECT when setting up work warm-up schedules, planning appropriate clothing, etc. Workers should use warming shelters at regular intervals at or below an ECT of 20°F. For exposed skin, continuous exposure should not be permitted at or below an ECT of -25°F.

7. Workers who become immersed in water or whose clothing becomes wet (from perspiration, rain, etc.) must immediately be provided a change of dry clothing whenever the air temperature is 25.6°F or below.

8. Although not mandated by corporate requirements, employees should strive to maintain an optimal level of worker fitness by encouraging regular exercise, proper diet, etc.

Monitoring

Personnel should be aware of the symptoms of cold stress. If the following symptoms of systemic hypothermia are noticed in any worker, he/she should immediately go to a warm shelter:

- heavy, uncontrollable shivering;
- excessive fatigue or drowsiness;
- loss of coordination;
- difficulty in speaking; and,
- frostbite (see below).

Frostbite is the generic term for local injury resulting from cold. The stages of frostbite and their symptoms are as follows:

1. frostbite or incipient frostbite:
    - sudden blanching or whitening of the skin.

2. superficial frostbite:
    - waxy or white skin which is firm to the touch (tissue underneath is still resilient).

3. deep frostbite:
    - tissues are cold, pale, and solid.

TABLE C-4(1)

COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED AS AN EQUIVALENT TEMPERATURE (UNDER CALM CONDITIONS)

Estimated Wind Speed (in mps)	**Actual Temperature Reading (°F)P**											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	LITTLE DANGER In < hr with dry skin. Maximum danger of false sense of security.				INCREASING DANGER Danger from freezing of exposed flesh within one minute.			GREAT DANGER Flesh may freeze within 30 seconds				
	Trenchfoot and immersion foot may occur at any point on this chart.											

Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

(1) Reproduced from American Conference of Governmental Industrial Hygienists, Threshold Limit Values and Biological Exposure Indices for 1985-1986, p. 01.

Attachment E
Drilling Protocols

DRILLING PROTOCOLS

Safety procedures during the operation of drilling machines include, but are not limited to the following:

- All site personnel should know the location of the drill rig emergency shut-off switch prior to beginning operations.

- The drill rig should be inspected prior to operation to ensure that it is in proper working condition and that all safety devices are functioning.

- Each drill rig should have a first-aid kit and fire extinguisher which should be inspected to ensure that they are adequate.

- All operators should wear, at a minimum, hard hats, steel-toe safety shoes or boots, gloves and safety glasses. Additional clothing and protective equipment may be required at sites where hazardous conditions are likely. Clothing must be close fitting, without loose ends, straps, draw strings or belts or other unfastened parts that might catch on moving machinery.

- Work areas should be kept free of materials, debris and obstruction, and substances such as grease or oil that could cause a surface to become slick or otherwise hazardous.

- Prior to drilling, the site must be checked to determine whether it can accommodate the drill rig and supplies and provide a safe working area.

- The drill rig mast (derrick) must be lowered prior to moving between drilling locations.

- The drill rig mast should not be raised if the rig will not be at least 20 feet away from overhead utilities.

- The location of underground utilities should be determined prior to erecting the drill rig.

- The drill rig must be properly erected, leveled and stabilized prior to drilling.

- The operator must shut down the drill engine before leaving the vicinity of the machine.

- All personnel not directly involved in operating the rig or in sampling should remain clear of the drilling equipment when it is in operation.

- All unattended boreholes must be adequately covered or otherwise protected to prevent trip and fall hazards. All open boreholes should be covered, protected or backfilled as specified in local or state regulations.

- When climbing to or working on a derrick platform that is higher than 20 feet, a safety climbing device should be used.

- The user of wire line hoists, wire rope and hoisting hardware should be as stipulated by the American Iron and Steel Institute Wire Rope Users Manual.

- The drill rig should be operated in a manner which is consistent with the manufacturers' ratings of speed, force, torque, pressure, flow, etc. The drill rig and tools should be used for the purposes for which they were intended.

Attachment F
Miscellaneous Task SOPs and Safety Measures

TASK SAFETY AND HEALTH RISK ANALYSIS

TASK SAFETY AND HEALTH RISK ANALYSIS

This Hazard Assessment identifies the general hazards associated with various work tasks and presents an analysis of documented or potential hazards associated with each, including site-specific work tasks identified from the scope of work (as indicated by asterisks [*]). Every effort must be made to reduce or eliminate these hazards. Those which cannot be eliminated must be guarded against by use of engineering controls and/or personal protective equipment.

Work Tasks

*Geophysical Site Inspection
*Drum Handling
Opening Drums and Overpacks
Drum Staging and Overpacking
Compatibility Testing and Compositing of Samples
*Working Around Heavy Equipment
Corrosive Liquid Transfer
Flammable/Combustible Liquid Transfer
Lab Packing and Lab Inventory
*Soil Excavation
Drum Sampling
Use of a High Pressure Water Cleaner
Drum Excavation
*Soil/Groundwater/UIC Sampling
High Pressure Washer During Vat Cleaning
Compressed Gas Cylinders
Empty Drum Crushing

Work Task Hazards and SOPs

*Hazards and SOPs Associated with Geophysical Site Inspection:

Hazards

1. Slip/trip/fall hazards from debris and holes, trenches in floor.
2. Injury from unstable overhead and falling building materials/debris.
3. Gas release hazards.
4. Direct skin contact and/or inhalation of contaminants.
5. Biological hazards.

SOPs

1. Be sure that all areas of entry have or are provided with adequate lighting.
2. All personnel should wear hard hats at all times when inside buildings and hot zones.
3. Be sure that all manholes/floor drains are covered and marked.
4. Be sure that stairways are structurally sound.
5. Be sure that all rooms are checked for loose or unstable overhead structures/debris.
6. Minimize slip/trip/fall hazards by keeping work areas clean and being aware of unstable or loose footing.
7. Air monitoring is to be conducted prior to inspection.
8. Proper level of protection.
9. Be aware of and avoid potential biological hazards.

*Hazards and SOPs Associated with Drum Handling:

Hazards

1. Injury from slip/trip/fall due to unstable ground conditions.
2. Cuts or abrasions from sharp or jagged metal during drum handling.
3. Potential for crushed fingers and toes, strained muscles, and back injury from moving heavy objects.
4. Operation of heavy equipment (e.g. backhoe with drum grappler).
5. Direct skin contact and/or inhalation of contaminants.

SOPs

1. Personnel are to be aware of footing as well as heavy equipment operating in the area.
2. Personnel should wear leather gloves and steel-toed boots.
3. Moving and opening drums is to be in accordance with 29 CFR 1910.120 (j).
4. Level B or C respiratory protection should be used when handling drums.
5. All heavy equipment to have backup alarms and ground spotters to assist operators. Eye to eye contact with the operator is to be made before approaching moving equipment.

Hazardous and SOPs Associated with Opening Drums and Overpacks Hazards

Hazards

1. The presence of air-reactive chemicals.
2. The presence of water-reactive chemicals, particularly when it is raining.
3. Direct skin contact, ingestion, and inhalation of contaminants.
4. Opening drums of unknown waste.
5. Splashing wastes.
6. Cuts from sharp metal edges.
7. Air lines tangled among the drums.
8. Slip/trip/fall.
9. Pinch points.
10. Bulging or visually unstable drums.

SOPs

1. Open drums and overpacks in Level B respiratory protection.
2. Be alert for bulging drums and chemical reactions.
3. Avoid allowing rain to enter drums.
4. Regular, periodic air monitoring is to be performed with the rad meter, monitor units, HNU and CGI to ensure a safe environment.
5. Keep fire extinguishers in the area.
6. Keep absorbent materials immediately available.
7. If a drum is bulging or difficult to open, use remote opening techniques.
8. Level B will be used when opening unknown drums, and when handling drums that are in poor physical condition.

Hazards and SOPs Associated with Drum Staging and Overpacking:

Hazards

1. Direct skin contact and inhalation, ingestion threat from hazardous materials.
2. Poor physical condition of drums. Rusty metal and holes indicate a high potential for spills and splashes during drum handling.
3. Routine heavy equipment hazards.
4. Physical hazards associated with drum handling operations - potential for crushed fingers and toes, strained muscles, and back injury from moving/lifting heavy objects.
5. Operation of heavy equipment (e.g. backhoe with drum grappler).

SOPs

1. Use of Level B or Level C personal protective equipment. Chemical resistant coveralls, gloves, splash shields, hard hats, and steel-toed boots should be used when handling drums, and in the vicinity of open drums.

2. Keep absorbents and emergency spill materials immediately available in the exclusion zone.
3. Use safe work practices to prevent physical injury.
4. Drums will be staged on a polyethylene-lined containment pad.

Hazards and SOPs Associated with Compatibility Testing and Composting of Samples:

Hazards:

1. Inhalation of hazardous fumes.
2. Mixing incompatible materials.
3. Splashing or spilling samples.

SOPs

1. Personnel not involved with compatibility testing procedures should not be in the area.
2. Personnel will wear safety glasses, gloves, and acid shields.
3. Containers should be clearly marked.
4. Chemicals should be added slowly an in small amounts with constant observation.
5. Personnel should evacuate the area in the event of uncontrolled chemical reactions.
6. All compatibility tests will be performed by an on-site chemist.

*Hazards and SOPs Associated with Working Around Heavy Equipment:

Hazards

1. Equipment movements.
2. Overhead and underground utility lines.
3. Unstable slopes and open pits.

SOPs

1. All equipment must have operational backup alarms.
2. Personnel must make eye-to-eye contact with the operator before approaching operating equipment.
3. Operators must be aware of personnel in the area and use proper hand signals when communicating.
4. Operators must use caution when handling containers of hazardous materials.
5. Operators must wear hard hats if the machine does not have an enclosed cab or cage cover.
6. Operators must wear hard hats when going to and from their machines.
7. Ground spotters are to assist heavy machine operators.

Hazards and SOPs Associated with Corrosive Liquid Transfer:

Hazards

1. Direct skin contact with corrosive materials.

2. Potential for spills or leaks during transfer operations.
3. Potential for chemical reaction from mixing incompatible liquids or from contact with transfer equipment.
4. Potential splashing of corrosive liquids during transfer operations.
5. Slip/trip/fall around transfer hoses and equipment.

SOPs

1. Wear protective corrosive resistant clothing (e.g., acid suits, splash shields). Be sure gloves and boots are taped to protective clothing. Take precautions to ensure that no skin surfaces are exposed.
2. Wear appropriate level of respiratory protection.
3. Keep absorbents and spill containment materials nearby in the event of a spill or leak.
4. Monitor transfers continuously for changes in conditions (e.g. reactivity, pressure buildup, fire). Personnel monitoring the pumping and receiving vessel must have clear and continuous communication. If necessary, install a remote shutoff on the transfer pump.
5. Make sure the transfer equipment (e.g. hoses, fittings, pumps, and receiving vessels) are compatible with the corrosive material and that they are clean.
6. Be aware of the locations of emergency showers and eye washes, which should be placed nearby during operations.
7. Have an emergency escape route and contingency plan.
8. Be sure that all drums are characterized and adequately and appropriately marked to avoid mixing incompatible materials.
9. Make transfer with caution, remembering that corrosives may react violently, even explosively, with a wide variety of chemicals.
10. Provide adequate ventilation to area of transfer activities.

Hazards and SOPs Associated with Flammable/Combustible Liquid Transfer:

Hazards

1. Direct skin contact, inhalation, ingestion.
2. Potential for fire or explosion during transfer.
3. Potential for spills during transfer.
4. Potential for chemical reaction during transfer.
5. Slip/trip/fall around transfer hoses and equipment.

SOPs

1. Use chemical resistant coveralls such as Saranex or butyl rubber when working with flammable/combustible liquids or when in the vicinity of open liquids.
2. Use Level B respiratory protection when opening tanks, when monitoring intake vacuum hoses when ambient organic concentrations exceed 5 ppm or while engaged in other high hazard/contact activities.
3. Level C may be sufficient for non-intrusive perimeter activities if ambient concentrations are less than 5 ppm.

4. Keep fire extinguishers in readily accessible locations.
5. Ground or bond the tank and tanker truck prior to beginning transfer operations.
6. Clear the area of all open flames or other ignition sources, and all flammable and combustible materials.
7. Use spark-proof tools and equipment.
8. Keep absorbents and spill containment equipment nearby in the event of a spill or leak.
9. Conduct air monitoring for organics, flammable/explosive vapors and oxygen as appropriate. Air monitoring equipment can be left in the work area unattended and programmed to sound an alarm if dangerous levels are encountered.
10. Have an emergency escape route planned and a contingency plan in case of an accident.
11. Be sure that all tanks are characterized and appropriately marked to avoid bulking of incompatible tanks.
12. Conduct the transfer with extreme caution, remembering that striking surfaces may cause sparks.

Hazards and SOPs Associated with Lab Packing and Lab Inventory:

Hazards

1. Possible skin contact with leaking bottles.
2. Mixing of incompatible materials.
3. Presence of shock sensitive materials.
4. Sudden release of dangerous vapors.

SOPs

1. Wear appropriate personal protective equipment, Level B, (e.g. splash shields, acid suits, hard hats, chemical resistant gloves).
2. Clearly mark containers.
3. Non-essential personnel must be restricted from area.
4. Have appropriate firefighting equipment present.
5. Review information files for possible chemical data.
6. Carefully follow lab packing guidelines specifically for the acceptable disposal facility.
7. Have sorbent materials on hand to quickly clean up any spills.

*Hazards and SOPs Associated with Soil Excavation (Drilling/Probing):

Hazards

1. Movement of heavy equipment during soil excavation.
2. Direct skin contact with contaminated soil.
3. Damaging drums while excavating which could release unknown contaminants.
4. Inhalation of contaminated dusts.
5. Loose footing and slip/trip/fall hazards.

SOPs

1. Personnel are to be aware of working locations of heavy equipment.
2. All equipment must have operational back-up alarms.
3. Personnel should make eye-to-eye contact with the operator before approaching heavy equipment.
4. Personnel should wear appropriate respiratory equipment.

*Hazards and SOPs Associated with Drum Sampling:

Hazards

1. Direct skin contact, ingestion and inhalation of contaminants.
2. Potential for chemical splash and mixing of incompatible materials, air or water reaction.
3. Poor physical condition of drums.
4. Slip/trip/fall hazards associated with slick surfaces or high or elevated work areas.

SOPs

1. Use chemical resistant coveralls such as Saranex or butyl rubber during sampling.
2. Use Level B respiratory protection for opening tanks or unknown materials, for sampling solvent tanks, or when ambient organic concentrations exceed 5 ppm.
3. Use Level C respiratory protection for re-sampling known materials and ambient organic concentrations are less than 5 ppm.
4. Keep fire extinguishers immediately available.
5. Keep absorbent materials immediately available.
6. Use a new drum thief to sample each drum or container.
7. Frequent air monitoring will be performed to ensure the quality of the ambient air.
8. If a drum is bulging or difficult to open, use remote opening techniques.

Hazards and SOPs Associated with the Use of High Pressure Water Cleaner:

Hazards

1. Body parts being injured/severed due to high pressure (3,000 psi) water stream.
2. Slip/trip/fall associated with water over spray and hose.
3. Control of high pressure nozzle.
4. Exposure to contaminants.

SOPs

1. Level C will be worn along with splash suit and shield.
2. No hands, feet, arms, or legs will be within three feet of high pressure nozzle.

3. Splash shields and rain protection should be worn over minimum level of protection.
4. Skin and ear protection may be required.
5. Operators are to be aware of other personnel or equipment in the area.
6. No personnel are to hold material being cleaned.

Hazards Associated with Drum Excavation:

Hazards

1. Drums may contain unknown hazardous substances.
2. Moving of drums may disturb otherwise intact hazardous materials.
3. Containers may be pressurized and subject to violent release of contents.

SOPs

1. Containers (other than empty containers) should be moved only by remote mechanical devices.
2. Where applicable polyethylene sheeting shall be placed in such a manner as to contain any spilled material.
3. Containers should not be handled by personnel until the contents and condition of the containers are recognized as safe to handle. (Level B protection applies.)
4. Use OVA or HNU and Radmeter for initial hazard identification of containers.

*Hazards and SOPs Associated with Soil/Groundwater/UIC Sampling:

Hazards

1. Contact with or inhalation of contaminants, potentially in high concentrations in sampling media.
2. Back strain and muscle fatigue due to lifting, shoveling and auguring techniques.
3. Contact with or inhalation of decontamination solutions.
4. Trip/fall hazards.

SOPs

1. Proper awareness of chemical contaminants and review of suspected contaminants should be completed. Appropriate PPE should be worn
2. Proper lifting (pre-lift weight assessment, use of legs, multiple personnel) techniques will prevent back stain. Use slow easy motions when shoveling, auguring, and digging to decrease muscle strain.
3. Material Safety Data Sheets for all decon solutions should be included with each Site Health and Safety Plan.
4. As the proposed work activities may include sampling of UIC structures, the Site Safety Officer shall incorporate awareness of trip/fall hazards into the daily tailgate safety meetings and conduct periodic inspections of the site to identify potential trip/fall hazards. In addition, following the completion of the daily activities, the Site Safety Officers shall inspect the site

for open UIC structures, excavations and other trip/fall hazards. If identified, the Site Safety Officer will be responsible for having these areas secured.

Hazards and SOPs Associated with the Use of as High Pressure Washer During Vat Cleaning:

Hazards

1. Body parts being injured/severed due to high pressure water stream.
2. Slip/trip/fall associated with water over spray and hose.
3. Control of high pressure nozzle.
4. Vat handling to facilitate cleaning.
5. Exposure to contaminants.

SOPs

1. No hands, feet, arms, or legs will be within three feet of high pressure nozzle.
2. Splash shields and rain protection should be worn over minimum level of protection.
3. Operators are to be constantly aware of other personnel/equipment in the area.
4. Personnel will not hold or be near vats while cleaning with high pressure washer is ongoing. If necessary, vats will be maneuvered with heavy equipment.

Hazards and SOPs Associated with Compressed Gas Cylinders:

Hazards

1. Sudden release of dangerous gases from unknown cylinders.
2. Slip/trip/fall from hidden or obstructed cylinders.
3. Possible sudden explosion from ruptured valves.

SOPs

1. To the extent possible, initial activities on site will involve locating and clearly marking the location of all unknown cylinders on site.
2. Equipment operators will be assisted by ground spotters when segregating drums and debris and during soil excavation activities.
3. When a damaged or corroded cylinder is found, it should not be moved or handled and extreme caution should be exercised in staying clear of the valve stem.
4. All identified cylinders will be examined and evaluated by an experienced and qualified person prior to moving any cylinders.
5. If a cylinder leaks or ruptures, all personnel will evacuate the area.

Hazards and SOPs Associated with Empty Drum Crushing:

Hazards

1. General hazards associated with heavy equipment operations.

2. Slip/trip/fall hazards.
3. Physical contact from splashing of any residual material that remains in drums.
4. Physical contact from flying metal pieces.

SOPs

1. Wear hard hats, face shields, safety goggles, and steel toed work boots at all times.
2. All personnel not necessary for the operation of equipment should stay clear of drum crushing activities.
3. Equipment operators are to be constantly aware of all other personnel/equipment in the area during operation.

Attachment G
Chemical Hazards

Ascent Battery Supply, LLC
1325 Walnut Ridge Drive
Hartland, Wisconsin 53029

Safety Data Sheet (SDS) — Alkaline Batteries

The information and recommendations below are believed to be accurate at the date of document preparation. Ascent Battery Supply makes no warranty or merchantability or any other warranty, express or implied, with respect to this information and assumes no liability resulting from its use. This SDS provides guidelines for safe use and handling of product. It does not, and cannot, advise all possible situations. All specific uses of this product must be evaluated by the end user to determine if additional safety precautions should be taken.

SECTION 1 - IDENTIFICATION

Product Name	Alkaline Batteries – Mercury Free
Common Name(s)	Alkaline
Synonyms	Primary Battery
DOT Description	Dry Battery
Chemical Name	Manganese Dioxide
Distributed By	Ascent Battery Supply, LLC 1325 Walnut Ridge Drive
Address	Hartland, Wisconsin 53029
Emergency Number	INFOTRAC (800) 535-5053
Overseas Emergency Number	INFOTRAC (352) 323-3500 (Collect)

SECTION 2 – HAZARD(S)

Unusual Fire and Explosion Hazards Cells may rupture when exposed to excessive heat. This could result in the release of flammable or corrosive materials.

SECTION 3 – COMPOSITION

Chemical Name	CAS No.	Percentage %
Manganese Dioxide	1313-13-9	32-40
Stainless Steel	7439-89-6	19-23
Zinc	7440-66-6	10-25
Potassium Hydroxide	1310-58-3	5-10
Graphite	7782-42-5	1-5
Barium Sulfate	7727-43-7	<5
Water, Paper, Plastic, other inert	N/A	balance

SECTION 4 – FIRST AID MEASURES

For Manganese Dioxide Chemicals:

Inhalation Get fresh air. If symptoms persist seek medical attention

Eyes and Skin **Skin:** Flush with copious quantities of flowing lukewarm water for a minimum of 15 minutes; wash with soap and water

Eyes: Flush with copious quantities of flowing lukewarm water for a minimum of 15 minutes; get immediate medical attention.

Ingestion Ingestion of battery chemicals can be harmful. Call The National Battery Ingestion Hotline (202-625-3333) 24 hours a day, for procedures treating ingestion of chemicals. Do not induce vomiting.

SECTION 5 – FIRE-FIGHTING MEASURES

Extinguisher Media Use water, foam or dry powder

Special Fire Fighting Procedures Wear self-contained breathing apparatus to avoid inhalation of hazardous decomposition products.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

In case of accidental rupture or release: prevent skin and eye contact and collect all released material in a plastic lined metal container. See also: sections 4, 5, and 8.

SECTION 7 – HANDLING AND STORAGE

1. Store in a dry place.
2. Do not store unpacked cells together: to avoid cells shorting to one another.
3. If packing materials are not available, please masking tape on the (+) and (–) ends of the cells.

SECTION 8 – EXPOSURE/PERSONAL PROTECTION

Respiratory Protection	None required under normal handling conditions
Gloves	Wear gloves if cell is ruptured, corroded, or leaking materials
Safety Glasses	Always wear safety glasses with working with battery cells

SECTION 9 – PHYSICAL/CHEMICAL PROPERTIES

Boiling Point	N/A	**Melting Point**	N/A
Vapor Pressure	N/A	**Vapor Density**	N/A
Specific Gravity	N/A	**Evaporation Rate**	N/A
Solubility in Water	N/A	**Appearance and Odor**	Geometric, solid object

SECTION 10 – STABILITY & REACTIVITY

Reactivity in Water	N/A	**Auto-Ignition Temperature**	N/A
Flash Point	N/A	**Flammable Limits in Air, by vol.**	N/A
Percent Volatile By Volume	N/A		
Stable	Avoid electrically shorting the cell		
Incompatibility (materials to avoid)	N/A		

SECTION 11 – TOXICOLOGICAL INFORMATION

Threshold Limit Value	N/A
Signs and Symptoms of Exposure	None. (In fire or rupture situations, refer to sections 4, 5, & 8.)
Medical Conditions Generally Caused by Exposure	Chemicals may cause burns to skin, eyes, gastrointestinal tract and mucous membranes.
Routes of Entry	Skin, Eyes, Ingestion (swallowing)

SECTION 12 – ECOLOGICAL INFORMATION

Hazardous Decomposition Products	N/A
Hazardous Polymerization	Will not occur

Under normal use these batteries do not release internal ingredients into the environment. Damaged or abused batteries may release small amounts of zinc, manganese, and potassium hydroxide. Do not carelessly discard, as small amounts of zinc may be released into storm or surface water. Do not discard batteries into a fire. Dispose of properly or recycle.

SECTION 13 - DISPOSAL

1. Alkaline (Manganese Dioxide) batteries have no hazardous waste characteristics and can be landfilled.

SECTION 14 – TRANSPORT

Alkaline Batteries are considered dry-cell batteries and are not considered ‘hazardous’ or ‘dangerous’ goods for transportation. These batteries must be packed in a way to prevent short circuits or generation of a dangerous quantity of heat.

SECTION 15 – REGULATORY INFORMATION

IATA Not considered to be 'dangerous goods'.
DOT Not considered to be a 'hazardous material'.

SECTION 16 - OTHER

Document Control No:	SDS20001 – Ascent SDS for Alkaline Batteries	**Revision:**	2	**Effective Date:**	12-05-2014

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909
US GHS

Synonyms: Ultra Low Sulfur Diesel; Low Sulfur Diesel; No. 2 Diesel; Motor Vehicle Diesel Fuel; Non-Road Diesel Fuel; Locomotive/Marine Diesel Fuel

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquids - Category 3
Skin Corrosion/Irritation – Category 2
Germ Cell Mutagenicity – Category 2
Carcinogenicity - Category 2
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)
Aspiration Hazard – Category 1
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

DANGER

Hazard Statements

Flammable liquid and vapor.
Causes skin irritation.
Suspected of causing genetic defects.
Suspected of causing cancer.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing fume/mist/vapours/spray.

Response
In case of fire: Use water spray, fog or foam to extinguish.
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
If swallowed: Immediately call a poison center or doctor. Do NOT induce vomiting.
IF exposed or concerned: Get medical advice/attention.

Storage
Store in a well-ventilated place. Keep cool.
Keep container tightly closed.
Store locked up.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
68476-34-6	Fuels, diesel, no. 2	100
91-20-3	Naphthalene	<0.1

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

First Aid: Ingestion
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, and other gaseous agents.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

Incompatibilities

Keep away from strong oxidizers.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Fuels, diesel, no. 2 (68476-34-6)

ACGIH: 100 mg/m3 TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)

Naphthalene (91-20-3)

ACGIH: 10 ppm TWA
15 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 10 ppm TWA; 50 mg/m3 TWA
NIOSH: 10 ppm TWA; 50 mg/m3 TWA
15 ppm STEL; 75 mg/m3 STEL

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Clear, straw-yellow.	**Odor:**	Mild, petroleum distillate odor
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	0.009 psia @ 70 °F (21 °C)	**Vapor Density:**	>1.0
Boiling Point:	320 to 690 °F (160 to 366 °C)	**Melting Point:**	ND
Solubility (H2O):	Negligible	**Specific Gravity:**	0.83-0.876 @ 60°F (16°C)
Evaporation Rate:	Slow; varies with conditions	**VOC:**	ND
Percent Volatile:	100%	**Octanol/H2O Coeff.:**	ND
Flash Point:	>125 °F (>52 °C) minimum	**Flash Point Method:**	PMCC
Upper Flammability Limit (UFL):	7.5	**Lower Flammability Limit (LFL):**	0.6
Burning Rate:	ND	**Auto Ignition:**	494°F (257°C)

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m3 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

This material has been positive in a mutagenicity study.

Carcinogenicity

A: General Product Information

Suspected of causing cancer.

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

B: Component Carcinogenicity

Fuels, diesel, no. 2 (68476-34-6)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Fuels, diesel, no. 2 (68476-34-6)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	35 mg/L [flow-through]	

Naphthalene (91-20-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	5.74-6.44 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	1.6 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	0.91-2.82 mg/L [static]	
96 Hr LC50 Pimephales promelas	1.99 mg/L [static]	

96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

Persistence/Degradability
No information available.

Bioaccumulation
No information available.

Mobility in Soil
No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions
See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging
Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

DOT Information
Shipping Name: Diesel Fuel
NA #: 1993 **Hazard Class:** 3 **Packing Group:** III
Placard:

* * * Section 15 - Regulatory Information * * *

Regulatory Information

Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Naphthalene (91-20-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

SARA Section 311/312 – Hazard Classes

Acute Health	Chronic Health	Fire	Sudden Release of Pressure	Reactive
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the de minimis levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right- To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Fuels, diesel, no. 2	68476-34-6	No	No	No	Yes	No	No
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Additional Regulatory Information

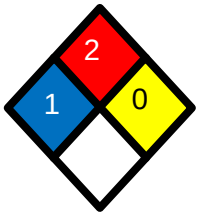
Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Fuels, diesel, no. 2	68476-34-6	Yes	DSL	EINECS
Naphthalene	91-20-3	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	1
Fire	2
Reactivity	0



HMIS® Hazard Rating

Health	1*	Slight
Fire	2	Moderate
Physical	0	Minimal
		*Chronic

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

Literature References

None

Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

EMERGENCY OVERVIEW
DANGER!
EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED - ASPIRATION HAZARD

NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

1. CHEMICAL PRODUCT and COMPANY INFORMATION

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC (800)424-9300**
COMPANY CONTACT (business hours): Corporate Safety (732)750-6000
MSDS (Environment, Health, Safety) Internet Website www.hess.com

SYNONYMS: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS *

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME).

Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

3. HAZARDS IDENTIFICATION

EYES
Moderate irritant. Contact with liquid or vapor may cause irritation.

SKIN
Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY
Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

4. FIRST AID MEASURES

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT:	-45 ^{o}F (-43^{o}C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 ^{o}F (>280 ^{o}C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

FIRE AND EXPLOSION HAZARDS
Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA
SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 “Low Expansion Foam - 1994 Edition.”

FIRE FIGHTING INSTRUCTIONS
Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE

HANDLING PRECAUTIONS

******USE ONLY AS A MOTOR FUEL******
******DO NOT SIPHON BY MOUTH******

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

EXPOSURE LIMITS

Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Exposure Limits Note
Gasoline (86290-81-5)	ACGIH	300	500	A3
Benzene (71-43-2)	OSHA	1	5	Carcinogen
	ACGIH	0.5	2.5	A1, skin
	USCG	1	5	
n-Butane (106-97-8)	ACGIH	1000	--	Aliphatic Hydrocarbon Gases Alkane (C1-C4)
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--	
	ACGIH	1000	--	A4
Ethyl benzene (100-41-4)	OSHA	100	--	
	ACGIH	100	125	A3
n-Hexane (110-54-3)	OSHA	500	--	
	ACGIH	50	--	Skin
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50		A3
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established
Toluene (108-88-3)	OSHA	200		Ceiling: 300 ppm; Peak: 500 ppm (10 min.)
	ACGIH	20	--	A4
1,2,4- Trimethylbenzene (95-63-6)	ACGIH	25	--	
Xylene, mixed isomers (1330-20-7)	OSHA	100	--	
	ACGIH	100	150	A4

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem ®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE

A translucent, straw-colored or light yellow liquid

ODOR
A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

ODOR THRESHOLD

	Odor Detection	Odor Recognition
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	85 to 437 ^{o}F (39 to 200 ^{o}C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 ^{o}F (38 ^{o}C) (275-475 mm Hg @ 68 ^{o}F (20 ^{o}C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H_2O = 1):	0.70 – 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %
SOLUBILITY (H_2O):	Non-oxygenated gasoline - negligible (< 0.1% @ 77 ^{o}F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 ^{o}F); ethanol is readily soluble in water

10. STABILITY and REACTIVITY)

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID
Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

INCOMPATIBLE MATERIALS
Keep away from strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS
Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY
Acute Dermal LD50 (rabbits): > 5 ml/kg
Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating
Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative

CHRONIC EFFECTS AND CARCINOGENICITY
Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

This product may contain methyl tertiary butyl ether (MTBE): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME:	Gasoline
DOT HAZARD CLASS and PACKING GROUP:	3, PG II
DOT IDENTIFICATION NUMBER:	UN 1203
DOT SHIPPING LABEL:	FLAMMABLE LIQUID

PLACARD:

15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION WT. PERCENT
Benzene (71-43-2)	0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline)
Ethyl benzene (100-41-4)	< 3

n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents (www.epa.gov/tri) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION - Parts per million (ppm) by weight
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

INGREDIENT NAME (CAS NUMBER)	Date Listed
Benzene	2/27/1987
Ethyl benzene	6/11/2004
Toluene	1/1/1991

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 2 (Flammable Liquid)
Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

16. OTHER INFORMATION

NFPA® HAZARD RATING	HEALTH:	1	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
HMIS® HAZARD RATING	HEALTH:	1 *	Slight
	FIRE:	3	Serious
	PHYSICAL:	0	Minimal
			* CHRONIC

SUPERSEDES MSDS DATED: 07/01/06

ABBREVIATIONS:

AP = Approximately	< = Less than	> = Greater than
N/A = Not Applicable	N/D = Not Determined	ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
AIHA	American Industrial Hygiene Association	DOT	U.S. Department of Transportation [General Info: (800)467-4922]
ANSI	American National Standards Institute (212)642-4900	EPA	U.S. Environmental Protection Agency
API	American Petroleum Institute (202)682-8000	HMIS	Hazardous Materials Information System

IARC	International Agency For Research On Cancer	REL	Recommended Exposure Limit (NIOSH)
MSHA	Mine Safety and Health Administration	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
NFPA	National Fire Protection Association (617)770-3000	SCBA	Self-Contained Breathing Apparatus
NIOSH	National Institute of Occupational Safety and Health	SPCC	Spill Prevention, Control, and Countermeasures
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	STEL	Short-Term Exposure Limit (generally 15 minutes)
NTP	National Toxicology Program	TLV	Threshold Limit Value (ACGIH)
OPA	Oil Pollution Act of 1990	TSCA	Toxic Substances Control Act
OSHA	U.S. Occupational Safety & Health Administration	TWA	Time Weighted Average (8 hr.)
PEL	Permissible Exposure Limit (OSHA)	WEEL	Workplace Environmental Exposure Level (AIHA)
RCRA	Resource Conservation and Recovery Act	WHMIS	Workplace Hazardous Materials Information System (Canada)

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

MATERIAL SAFETY DATA SHEET

FILE NO. 9636, 9637, 9638, 9616, 11360
NAME OF PRODUCT: AW Hydraulic Oil ISO 46 **MSDS DATE:** December, 2009

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: AW Hydraulic Oil ISO 46
SYNONYMS: hydraulic fluid
PRODUCT CODES: 9616,9636,9637,9637Tray,9638,11360, CG46AWBlue

MANUFACTURER: CGF INC
DIVISION: N/A
ADDRESS: 317 Peoples Avenue Rockford, IL 61104 USA

EMERGENCY PHONE: 800/424-9300
CHEMTREC PHONE: 800/424-9300
OTHER CALLS: 815-967-4400
FAX PHONE: 815-967-4404

PRODUCT USE: Hydraulic Fluid
PREPARED BY: Irena Larson/Denise Brauer

SECTION 1 NOTES:

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT: Petroleum base oils, additive package.

CAS NO.	% WT	% VOL	SARA 313 REPORTABLE
64741-88-4	75-85		None
64742-01-4	15-25		None
Proprietary Additive(s)	0.5-1.5		None

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This material is not considered hazardous according to OSHA criteria.

ROUTES OF ENTRY: Skin contact or inhalation.

POTENTIAL HEALTH EFFECTS

EYES: Contact may cause mild eye irritation including stinging, watering, and redness.

SKIN: Contact may cause mild skin irritation including redness and a burning sensation. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin and possibly dermatitis (inflammation). No harmful effects from skin absorption are expected.

INGESTION: No harmful effects expected from ingestion.

INHALATION: No information available on acute toxicity.

ACUTE HEALTH HAZARDS: No

CHRONIC HEALTH HAZARDS: No

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Skin disorders may be aggravated by exposure.

CARCINOGENICITY

OSHA: None **ACGIH: None** **NTP:** None **IARC: None**
OTHER:

SECTION 3 NOTES:

SECTION 4: FIRST AID MEASURES

EYES: If irritation or redness develops, flush eyes with clean water. If symptoms persist, seek medical attention.

SKIN: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with a mild soap and water or a waterless hand cleaner. If irritation persists, seek medical attention.

INGESTION: First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.

INHALATION: If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention.

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS: High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing wound. Often these injuries require emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury.

Acute aspirations of large amounts of mineral oil-laden material may produce serious aspiration pneumonia. Patients who aspirate these oils should be followed for the development of long-term sequelae. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities.

SECTION 4 NOTES:

SECTION 5: FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, foam, or water spray is recommended.

SPECIAL FIRE FIGHTING PROCEDURES:
Water or foam may cause frothing of materials heated above 212 F. Carbon dioxide can displace oxygen. Use caution when applying dioxide in confined spaces.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters muct use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This material may burn, but will not ignite readily. If container is not properly cooled, it can rupture in the heat of fire.

HAZARDOUS DECOMPOSITION PRODUCTS: No data

Flash Point: C(F) : >210(410) (ASTM D-92)
Flammable Limits (approx. % vol. in air)- LEL: 0.9%, UEL: 7.0%
NFPA HAZARD ID: Health: 1, Flammability: 1, Reactivity: 0

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES:
Personal Precautions:
This material may burn, but will not ignite readily. Keep all sources of ignition away from spill/release. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Notify persons downwind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant.
Environmental Precautions: Stop spill/release if it can be done with minimal risk. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Contact appropriate agency for spills into or upon navigable waters that cause a sheen or discoloration on the water surface.

Methods for Containment and Clean Up:
Notify fire authorities and appropriate regulatory authorities. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Spilled material may be absorbed into an appropriate absorbent material.

SECTION 7: HANDLING AND STORAGE

HANDLING AND STORAGE:
Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment. High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection

apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment. Do not enter confined spaces such as tanks or pits without following proper entry procedures. Do not wear contaminated clothing or shoes. "Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Use and store this material in cool, dry, well-ventilated areas away from heat and all sources of ignition. Keep container(s) tightly closed. Store only in approved containers. Keep away from any incompatible material. Protect container(s) against physical damage.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Componet	**ACGIH**	**OSHA**
Lubricant Base Oil-Petroleum	TWA: 5mg/m^3	TWA: 5mg/m^3
	STEL: 10mg/m^3	as Oil mist, if generated
	As oil mist, if generated	

ENGINEERING CONTROLS: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

RESPIRATORY PROTECTION: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with R or P95 filters may be used. A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (MUC) as directed by regulation or the manufacturer's instructions, in oxygen deficient (less than 19.5 percent oxygen) situations, or other conditions that are immediately dangerous to life and health (IDLH).

EYE PROTECTION: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

SKIN PROTECTION: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the performance of their products. Suggested protective materials: Nitrile

SECTION 8 NOTES: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Clear Blue Liquid

ODOR: mild petroleum

PHYSICAL STATE: Liquid

pH AS SUPPLIED: Not applicable
pH (Other):
BOILING POINT: No data
F: >600
C: >316

FLASH POINT:
F: >410
C: >210
METHOD USED: (ASTM D-92)

AUTOIGNITION TEMPERATURE:
F: 671
C: 355

MELTING POINT: No data
F:
C:
FREEZING POINT: No data
F:

C:

VAPOR PRESSURE (mmHg): <1
@ 20 C :< 0.1

VAPOR DENSITY (AIR = 1): >2
@
F: 68
C: 20
SPECIFIC GRAVITY (H2O = 1): 0.87
@
F: 60
C: 15.6
EVAPORATION RATE: n/a

BASIS (=1):

SOLUBILITY IN WATER: not soluble

PERCENT SOLIDS BY WEIGHT: n/a

PERCENT VOLATILE: Negligible
BY WT/ BY VOL @
F: 68
C: 20
VOLATILE ORGANIC COMPOUNDS (VOC): no data

WITH WATER: LBS/GAL
WITHOUT WATER: LBS/GAL

MOLECULAR WEIGHT: no data
VISCOSITY:
200-300 SUS @ 100 Degree F
@ 40 C cST 47.25

SECTION 9 NOTES: Data represents typical values and are not intended to be specifications.

SECTION 10: STABILITY AND REACTIVITY

	STABLE	UNSTABLE
STABILITY:	**YES**	

CONDITIONS TO AVOID (STABILITY): Avoid excessive heat, formations of vapors or mists.

INCOMPATIBILITY (MATERIAL TO AVOID): Strong oxidizing agents

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: None under normal storage.

HAZARDOUS POLYMERIZATION: No

CONDITIONS TO AVOID (POLYMERIZATION): n/a

SECTION 10 NOTES:

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:
Carcinogenicity: The petroleum base oils contained in this product have been highly refined by a variety of processes including solvent extraction, hydrotreating, and/or dewaxing to remove aromatics and improve performance characteristics. No components in this formulation have been identified as a carcinogen.

Component	Oral LD50	Dermal LD50	Inhalation LC50
Lubricant Base Oil	**>5g/kg**	**>2g/kg**	**No data**

SECTION 11 NOTES:

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: Ecotoxicological data have not been determined specifically for this product. Information given is based on knowledge of the components and the ecotoxicology of similar products.
Acute Toxicity: Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.
Mobility: Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.
Persistence/degradability: Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.
Bioaccumulation : Contains components with the potential to bioaccumulate.
Other Adverse Effects: Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential

SECTION 12 NOTES:

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:
Material Disposal: Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.
Container Disposal: Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.
Local Legislation: Disposal should be in accordance with applicable regional, national, and local laws and regulations.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: Not regulated
PROPER SHIPPING NAME:
HAZARD CLASS:
ID NUMBER:
PACKING GROUP:
LABEL STATEMENT:

WATER TRANSPORTATION: Not regulated
PROPER SHIPPING NAME:
HAZARD CLASS:
ID NUMBER:
PACKING GROUP:
LABEL STATEMENTS:

AIR TRANSPORTATION: Not regulated
PROPER SHIPPING NAME:
HAZARD CLASS:
ID NUMBER:
PACKING GROUP:
LABEL STATEMENTS:

OTHER AGENCIES:

SECTION 14 NOTES:

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

TSCA (TOXIC SUBSTANCE CONTROL ACT): All components of this formulation are listed on the US EPA-TSCA inventory or not regulated under TSCA.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling is not required.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KOREA, and PHILIPPINES.

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT): This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT): This product contains no"EXTREMELY HAZARDOUS SUBSTANCES".

311/312 HAZARD CATEGORIES: None
Acute Health: No
Chronic Health: No
Fire Hazard: No
Pressure Hazard: No
Reactive Hazard: No

313 REPORTABLE INGREDIENTS: This material does not contain any chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372.

STATE REGULATIONS: This material does not contain any chemicals with CERCLA Reportable Quantities.

California Proposition 65:
This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

INTERNATIONAL REGULATIONS:

Canadian Regulations:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
None

SECTION 15 NOTES:

SECTION 16: OTHER INFORMATION

OTHER INFORMATION:

PREPARATION INFORMATION: Issue Date: August 2009 Rev. #1

DISCLAIMER:
The information presented herein has been compiled from sources considered to be dependable and accurate to the best of Cutting & Grinding Fluids Inc., knowledge. However, CGF INC., makes no warranty whatsoever expressed or implied of merchantability or fitness for the particular purpose, regarding the accuracy of such data or the results to be obtained from the use thereof. Cutting & Grinding Fluids, Inc. assumes no responsibility for the injury to recipient or to the third persons or for any damage to any property and recipient assumes all such risks.

Ascent Battery Supply, LLC
1325 Walnut Ridge Drive
Hartland, Wisconsin 53029

Safety Data Sheet (SDS) — Nickel Cadmium (NiCd) Batteries

The information and recommendations below are believed to be accurate at the date of document preparation. Ascent Battery Supply makes no warranty or merchantability or any other warranty, express or implied, with respect to this information and assumes no liability resulting from its use. This SDS provides guidelines for safe use and handling of product. It does not, and cannot, advise all possible situations. All specific uses of this product must be evaluated by the end user to determine if additional safety precautions should be taken.

SECTION 1 - IDENTIFICATION

Product Name	Nickel Cadmium Battery		
Common Name(s)	NiCd, NiCad, Nickel Cadmium		
Synonyms	Nickel Cadmium Rechargeable Battery		
DOT Description	Dry Battery		
Chemical Name	Nickel Cadmium Secondary Battery		
Distributed By	Ascent Battery Supply, LLC	**Emergency Number**	INFOTRAC (800) 535-5053
Address	1325 Walnut Ridge Drive Hartland, Wisconsin 53029	**International Emergency Number**	INFOTRAC (352) 323-3500 (Collect)

SECTION 2 – HAZARD(S)

Unusual Fire and Explosion Hazards Cells may rupture when exposed to excessive heat. This could result in the release of flammable or corrosive materials.

SECTION 3 – COMPOSITION

Chemical Name	CAS No.	Wt. Percentage %
Nickel	7440-02-0	15-22%
Potassium Hydroxide	1310-58-3	1.5-3%
Mercury	7439-79-6	≤5 ppm
Lead	7439-92-1	≤10 ppm
Cadmium	7440-43-9	18-26%
Other/Housing	n/a	balance

SECTION 4 – FIRST AID MEASURES

Inhalation Get fresh air. If symptoms persist seek medical attention

Eyes and Skin **Skin:** Flush with copious quantities of flowing lukewarm water for a minimum of 15 minutes; wash with soap and water

Eyes: Flush with copious quantities of flowing lukewarm water for a minimum of 15 minutes; get immediate medical attention.

Ingestion Ingestion of battery chemicals can be harmful. Call The National Battery Ingestion Hotline (202-625-3333) 24 hours a day, for procedures treating ingestion of chemicals. Do not induce vomiting.

SECTION 5 – FIRE-FIGHTING MEASURES

Extinguisher Media Use CO_2, foam or dry chemical extinguishers. Sand may also be used.

Special Fire Fighting Procedures Wear self-contained breathing apparatus to avoid inhalation of hazardous decomposition products.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

In case of accidental rupture or release: prevent skin and eye contact and collect all released material in a plastic lined metal container. Leaking batteries should be handled with gloves. Wear protective clothing. Use a self-contained breathing apparatus if in the presence of chemical vapor. See also: sections 4, 5, and 8.

SECTION 7 – HANDLING AND STORAGE

1. Store in a dry place with ambient temperature between -20°C(-4°F) and 35°C(95°F).
2. Do not store unpacked cells together: avoid cells shorting to one another – especially in a charged state.
3. Do not mix new and used batteries.
4. Do not disassemble.
5. Do not store with conductive objects.
6. Store away from flame or spark hazards.

SECTION 8 – EXPOSURE/PERSONAL PROTECTION

Respiratory Protection	None required under normal handling conditions
Gloves	Wear gloves if cell is ruptured, corroded, or leaking materials
Safety Glasses	Always wear safety glasses with working with battery cells

SECTION 9 – PHYSICAL/CHEMICAL PROPERTIES

Boiling Point	N/A	**Melting Point**	N/A
Vapor Pressure	N/A	**Vapor Density**	N/A
Specific Gravity	N/A	**Evaporation Rate**	N/A
Solubility in Water	N/A	**Appearance and Odor**	Cylindrical, solid object, odorless

SECTION 10 – STABILITY & REACTIVITY

Reactivity in Water	N/A	**Auto-Ignition Temperature**	N/A
Flash Point	N/A	**Flammable Limits in Air, by vol.**	N/A
Percent Volatile By Volume	N/A		
Stable	Avoid electrically shorting the cell. Under normal conditions this product is stable and will not decompose.		
Incompatibility (materials to avoid)	N/A		

SECTION 11 – TOXICOLOGICAL INFORMATION

Threshold Limit Value	N/A
Signs and Symptoms of Exposure	None. (In fire or rupture situations, refer to sections 4, 5, & 8.)
Medical Conditions Generally Caused by Exposure	Chemicals may cause burns to skin, eyes, gastrointestinal tract and mucous membranes. Inhalation of electrolyte vapors may cause irritation of the upper respiratory tract and lungs.
Routes of Entry	Skin, Eyes, Ingestion (swallowing)

SECTION 12 – ECOLOGICAL INFORMATION

Hazardous Decomposition Products N/A

Hazardous Polymerization Will not occur

Under normal use these batteries do not release internal ingredients into the environment. Damaged or abused batteries may release small amounts of cadmium, nickel or carbon oxides. Do not carelessly discard, as small amounts of cadmium may be released into storm or surface water. Do not discard batteries into a fire. Dispose of properly or recycle.

SECTION 13 - DISPOSAL

Dispose of batteries according to all Federal, State and local laws and regulations.

SECTION 14 – TRANSPORT

These batteries must be packaged in a way that prevents the dangerous evolution of heat and protects the terminals from short circuit. When properly packaged and labeled, these dry batteries are not subject to dangerous goods regulation for the purpose of transportation and fall under special provision of the agencies listed in Section 15.

SECTION 15 – REGULATORY INFORMATION

IATA Not considered to be 'dangerous goods' when packaged properly
DOT Not considered to be a 'hazardous material' when packaged properly
ICAO Not subject when packaged properly
IMDG Not subject when packaged properly
UN2800 Exempted when packaged properly

SECTION 16 - OTHER

Document Control No:	SDS20008 – Ascent SDS for Nickel Cadmium (NiCd) Batteries	**Revision:**	1	**Effective Date:**	01-02-2015

Attachment H
Confined Space Entry Checklist/ Permit

NON-PERMIT REQUIRED CONFINED SPACE

PRE-ENTRY/ENTRY CHECK LIST

Date and Time:
Issued By:
Job Site:
Work to Be Performed:

Date and Time Expire:
Excavation Number:
Job Supervisor:
Work to Be Performed:

Pre-Entry (See Safety Procedures)

1. Atmospheric Checks: Time:
   Oxygen: %
   Explosive: % LEL

1. Entry, standby, and backup persons

	Yes	No
Successfully completed required training?	( )	( )
Is it current?	( )	( )

2. Source Isolation (No Entry): N/A

	N/A	Yes	No
Pumps or lines blinded, disconnected or blocked	( )	( )	( )

3. Ventilation Modification

	N/A	Yes	No
Mechanical	( )	( )	( )
Natural Ventilation Only	( )	( )	( )

3. Equipment:

	N/A	Yes	No
Direct reading gas monitor-tested	( )	( )	( )
Safety harnesses and life-lines for entry and standby persons?	( )	( )	( )
Hoisting Equipment?	( )	( )	( )
Powered Communications?	( )	( )	( )
SCBAs for Entry and Standby Persons?	( )	( )	( )
Protective Clothing?	( )	( )	( )

4. Atmospheric check after isolation and ventilation
   Oxygen _____ % > 19.5%
   Explosive _____ % LEL < 10%
   Toxic _____ PPM < 10 PPM H_2S
   Time _____

5. Rescue Procedure:_____

If conditions are in compliance with the above requirements and there is no reason to believe conditions may change adversely, then proceed to the Permit Space Pre-entry Check List. Complete and post with this permit. If conditions are not in compliance with the above requirements or there is reason to believe that conditions may change adversely, proceed to the Entry Check List portion of this permit.

We have reviewed the work authorized by this permit and the information contained here-in. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit and Check List Prepared By: _____

Approved By: _____

Reviewed By: _____
(Signature)

A copy of this Pre-Entry Check List must be retained in a bound notebook for each excavation.

If during the work hazardous atmospherics develop in the space, the work must be immediately terminated.

CONFINED SPACE ENTRY PERMIT

_____ Confined Space _____ Hazardous Area _____ Non Permit Required

Note: No work will be performed unless the space meets non permit requirements
Permit valid for 8 hours only. All copies of permit will remain at this job site until job is completed.

Site location and description _____

Purpose of Entry _____

Supervisor(s) in charge of crews _____

Type of Crew _____ Phone # _____

_____

Bold denotes minimum requirements to be completed and reviewed prior to entry

Requirements Completed	Date	Time	Requirements Completed	Date	Time
Lock Out/De-energize/try-out	_____	_____	**Full Body Harness w/"D" Ring**	_____	_____
Line(s) Broken-capped-blanked	_____	_____	**Emergency Escape Retrieval**	_____	_____
Purge-Flush and Vent	_____	_____	**Lifelines**	_____	_____
Ventilation	_____	_____	Fire Extinguishers	_____	_____
Secure Area (Post and Flag)	_____	_____	Lighting (Explosive Proof)	_____	_____
Breathing Apparatus	_____	_____	Protective Clothing	_____	_____
Resuscitator-Inhalator	_____	_____	Respirator(s) (Air Purifying)	_____	_____
Standby Safety Personnel	_____	_____	Burning and Welding Permit	_____	_____

Note: Items that do not apply enter N/A in the blank.

** Record Continuous Monitoring Results Every 2 Hours.

Continuous	Permissible	Monitoring Results
Percent of Oxygen	19.5% to 23.5%	
Lower Flammable Limit	Under 10%	

Hydrogen Sulfide	+ 10 PPM * 15	

* Short-term exposure time: Employee can work in the area up to 15 minutes.
+ 8 hour time - Weighted average: Employee can work in area 8 hours (longer with appropriate respiratory protection).
** Record continuous monitoring results every 30 minutes starting ½ hour prior to beginning work.

REMARKS:
Gas Tester Name & Check # Instrument(s) Used Model &/or Type Serial &/or Unit #

_____

_____

Safety standby person is required for all confined space work

Safety standby person(s) Check # Name of Safety Standby Person(s) Check #

_____

Supervisor Authorizing Entry _____

All Above Conditions Satisfied _____

Emergency number posted in job trailer _____

Note: A single entry permit can be filled out prior to start of daily work.

Attachment I
Emergency Telephone Numbers
Hospital Information
Field Accident Report

EMERGENCY INFORMATION

Emergency telephone numbers and routes to the nearest hospital with an emergency capacity are as follows:

General Emergencies:	911
NYPD – 73rd Precinct	911 for emergency or 1-718-495-5411
FDNY:	911
First Responder Medical Care:	911
National Response Center	1-800-424-8802
NYC Regional Poison Control Center	1-800-222-1222
NYS Spill Hotline:	1-800-457-7362
National Response Center:	1-800-424-8802
NYCDEP Hotline:	311 (in NYC); Otherwise (212) 639-9675
Project Manager - Bryan Murty	1-212-857-7350 or 1-631-655-9373
SSO – Bryan Murty	1-212-857-7350 or 1-631-655-9373
Alternate SSO – Stephen Kaplan	1-631-787-3400 or 1-631-316-4892

For Non-Emergency Care – (Emergencies must call 911)

Nearest Hospital: Brookdale University Hospital Medical Center
1 Brookdale Plaza
Brooklyn, New York 11212
1-718-240-5000

Directions to Brookdale University Hospital Medical Center (Approximately 1.4 miles from the site):

Head north on Chester Street Avenue and turn left onto East New York Avenue. Continue for 0.2 mile and turn left onto Amboy Street. Continue for 0.5 mile and turn right onto Dumont Avenue. Continue for 522 feet and turn left onto Strauss Street. Continue for 0.5 mile and turn left onto East 98th Street. Continue for 425 feet and arrive at Brookdale University Hospital Medical Center.

A map showing the route to the nearest hospital is provided in Appendix A, Figure 2.

VHB Engineering, Surveying, Landscape Architecture and Geology, P.C.

FIELD ACCIDENT REPORT

This report is to be filled out by the designated Site Safety Officer after EVERY accident.

PROJECT NAME _____ PROJECT. NO._____

Date of Accident _____ Time _____ Report By _____

Type of Accident (Check One):

( ) Vehicular ( ) Personal ( ) Property

Name of Injured _____ DOB or Age _____

How Long Employed _____

Names of Witnesses _____

_____

Description of Accident _____

_____

_____

Action Taken _____

_____

_____

Did the Injured Lose Any Time? _____ How Much (Days/Hrs.)? _____

Was Safety Equipment in Use at the Time of the Accident (Hard Hat, Safety Glasses, Gloves, Safety Shoes, etc.)? _____

_____

(If not, it is the EMPLOYEE'S sole responsibility to process his/her claim through his/her Health and Welfare Fund.)

INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

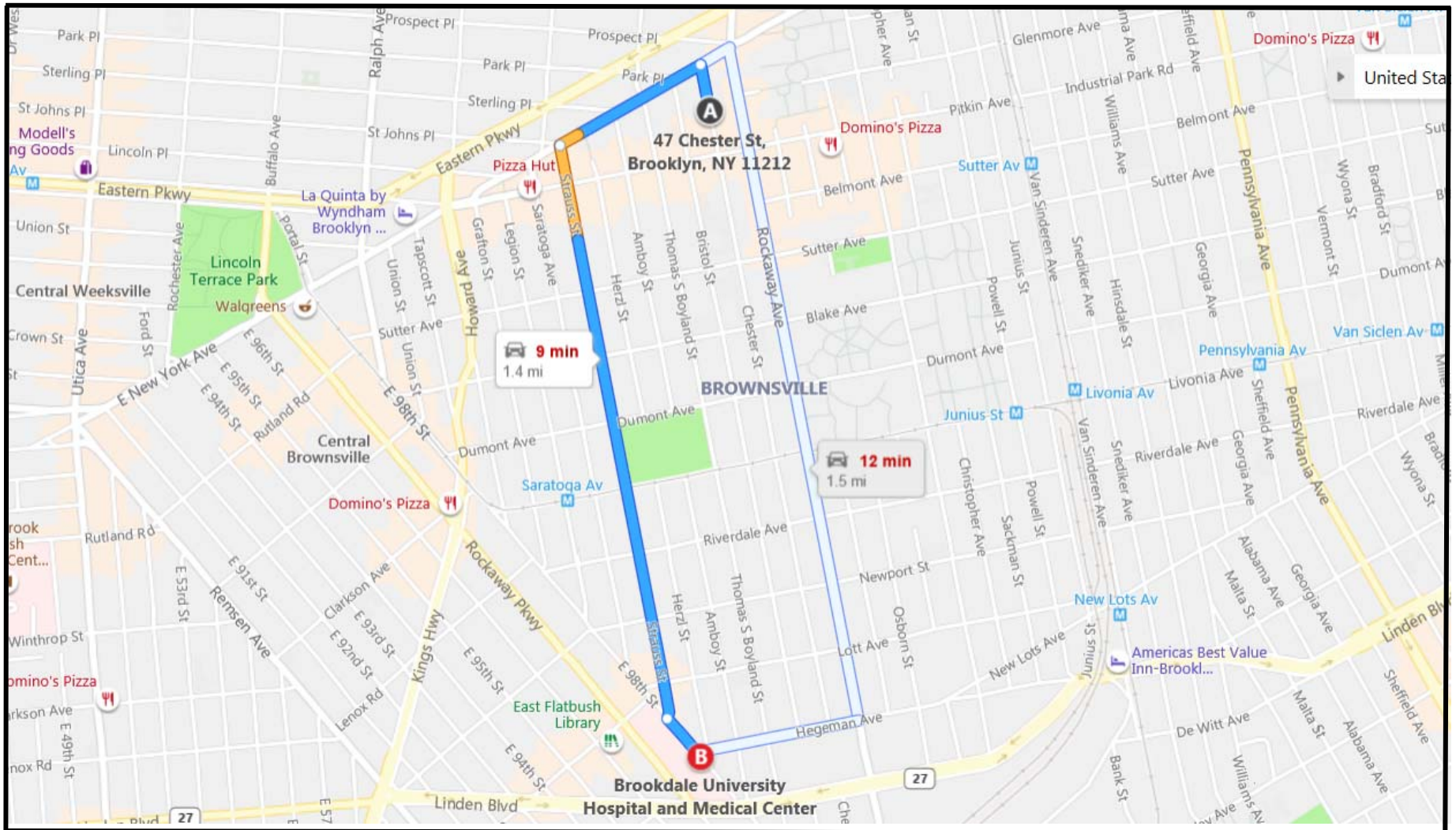


FIGURE 2 - ROUTE TO HOSPITAL

SITE NAME: Vacant Parcels
ADDRESS Rockaway Avenue & Chester Street
CITY, STATE, ZIP: Brooklyn, New York 11218
PROJECT NUMBER: 26645.00
SOURCE: Bing, 2019

bing maps

A 47 Chester St, Brooklyn, NY 11212

B Brookdale University Hospital and Medical Center, 1 Brookdale Plz, Brooklyn, NY 11212

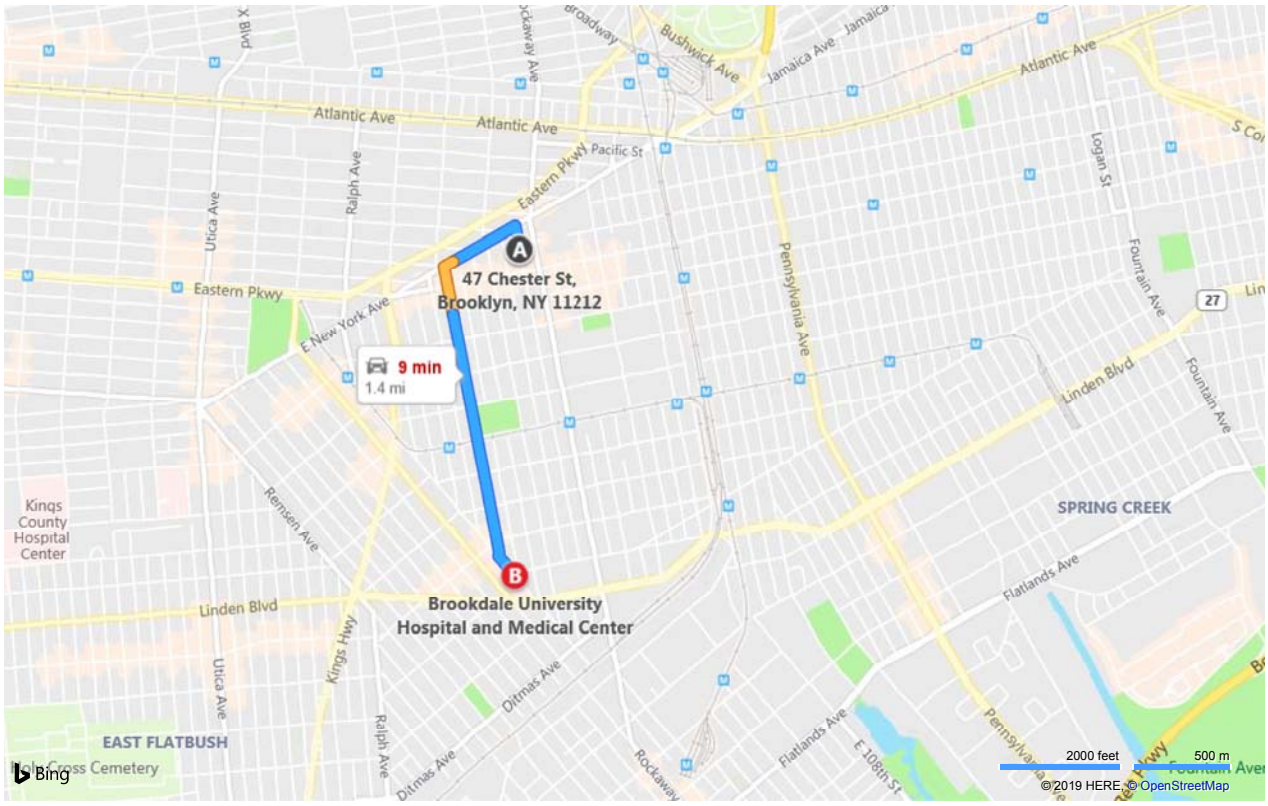
9 min , 1.4 miles
Heavy traffic (3 min delay)
Via E New York Ave, Strauss St
· Local roads

Type your route notes here

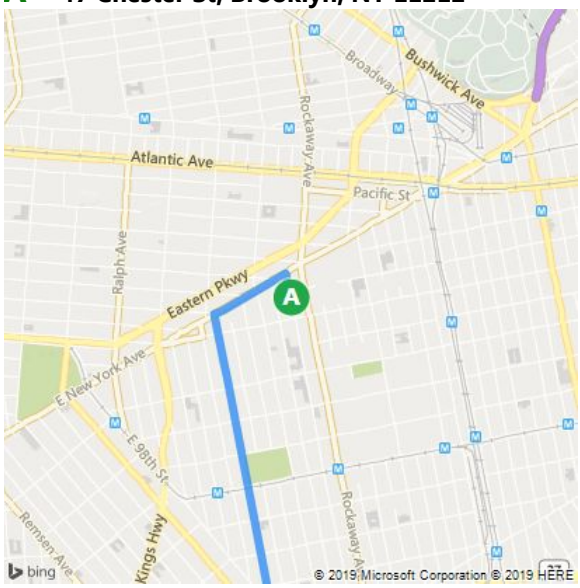
A 47 Chester St, Brooklyn, NY 11212

↑	1.	Head north on **Chester St** toward E New York Ave	407 ft
↰	2.	Turn **left** onto **E New York Ave**	0.3 mi
↰	3.	Turn **left** onto **Strauss St**	0.9 mi
↰	4.	Turn **left** onto **E 98th St**	427 ft
	5.	Arrive at **E 98th St** on the right The last intersection is Hegeman Ave If you reach Herzl St, you've gone too far	

B Brookdale University Hospital and Medical Center



A **47 Chester St, Brooklyn, NY 11212**



B **Brookdale University Hospital and Medica...**