March 28, 2023

New York State Department of Environmental Conservation
Mr. Timothy Schneider
Region 8 Office
6274 Avon-Lima Road
Avon, New York 14414

RE: Off-Site Investigation Work Plan
Former Alliance Metal Stamping & Fabrication Facility Offsite
NYSDEC BCP Site No. C828101A
CHA Project No.: 080117

Dear Mr. Schneider:

Pursuant to our previous correspondence, on behalf of Alliance Tool Corporation, CHA Consulting, Inc. (CHA) accepts the modifications made to the Off-Site Investigation Work Plan, prepared by CHA and submitted to the NYSDEC December 23, 2022. CHA will move forward with scheduling the work described in the work plan at the building located at 10 Pixley Industrial Parkway (Building). Responses to the comments/modifications listed in the NYSDEC letter dated February 16, 2023, are below.

Comment 1: Section 3.1 Building Survey: Product inventory/building questionnaire must include how each space is used, square footage of each area, type of HVAC that is in operation, activities performed in the area, office space vs. storage space and how it is defined, how many employees, chemicals used, etc.

Response 1: *CHA will incorporate the requested information in the product inventory/building questionnaire.*

Comment 2: Section 3.2 Indoor and Outdoor Ambient Air Sampling: Indoor air samples must be collected from routinely occupied areas within the building.

Response 2: *CHA notes and will implement this request.*

Comment 3: Section 3.3 Sub-Slab Vapor Sampling: Four sub-slab samples will be collected, not three.

Response 3: *CHA notes this typo and intends to collect four sub-slab samples.*

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Comment 4: Section 10.0 Reporting: At a minimum, work plan reporting must inform if the nature and extent of contamination is defined and if data documents potential exposure pathways. If contamination not defined and/or potential exposure pathways. If contamination not defined and/or potential exposure pathways are documented, a deliverable schedule will be included to address necessary supplemental investigation and/or actions to address potential exposure.

Response 4: *CHA understands this comment to mean the reporting should describe the nature and extent of contamination, if identified, in both matrices proposed for sampling (ie. air and groundwater). CHA concurs and will describe the nature and extent of contamination. Additionally, CHA will prepare a schedule of actions if a potential exposure pathway is identified and supplemental investigation and/or mitigation is recommended.*

An access agreement with the building owner/occupant has been finalized. The schedule, below, is based upon receipt of the access agreement and we do not anticipate any significant changes to the schedule at this time.

Description of Activity	Timeline
Soil Vapor Intrusion Investigation	April 6-7, 2023
Soil Vapor Intrusion Report	By May 5, 2023
Groundwater Well Installation	Week of April 24, 2023
Groundwater Monitoring	Concurrent with BCP Site C828101 2nd Quarter 2023 Groundwater Monitoring
Final Report	Within 6 weeks of the Groundwater Monitoring event

Should you have any questions, please feel free to contact me at kcowan@chacompanies.com.

Sincerely,

Keith Cowan, P.G.
Vice President

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Off-Site Investigation Work Plan

Former Alliance Metal Stamping & Fabrication Facility
12 Pixley Industrial Parkway
Gates, New York

BCP Site Number: C828101

CHA Project Number: 080117.000

Prepared for:
Alliance Tool Corporation
1000 University Avenue,
Rochester, New York 14607

Prepared by:

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December 2022
(Rev March 2023)

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LIST OF ACRONYMS & ABBREVIATIONS

AMSF	Alliance Metal Stamping & Fabrication Facility
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BGS	Below Ground Surface
CAMP	Community Air Monitoring Program
CHA	CHA Consulting, Inc.
COC	Chain of Custody
DER-10	Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation
EE	Environmental Easement
ELAP	Environmental Laboratory Approval Program
EPA	United States Environmental Protection Agency
FER	Final Engineering Report
HASP	Health and Safety Plan
IA	Indoor Air
IC/EC	Institutional Control/Engineering Control
IRM	Interim Remedial Measure
LCS	Laboratory Control Sample
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OA	Outdoor Air
PCE	Tetrachloroethylene
PID	Photoionization Detector
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percent Difference
RW	Recharge Well
SIM	Selective Ion Monitoring
SMP	Site Management Plan
SOP	Standard Operating Procedures
SSDS	Sub-Slab Depressurization System
SSV	Sub-Slab Vapor
SVI	Soil Vapor Investigation
TCL	Target Compound List
TMP	Tax Map Parcel
TO-15	Toxic Organics - 15
TOGS 1.1.1.	Technical and Operational Guidance Series 1.1.1.
VOC	Volatile Organic Compound

CERTIFICATION STATEMENT

I, Keith Cowan, P.G., certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Keith Cowan, P.G.
Vice President

1.0 INTRODUCTION

The Maguire Family Properties, Inc. entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) in October 2011 to investigate and remediate a 7-acre parcel located at 12 Pixley Industrial Parkway, Town of Gates, New York (Site). The Brownfield Cleanup Program (BCP) Site Code for the Site is C828101. The Site is identified as Tax Map Parcel (TMP) is 119.17-1-2 in the County of Monroe, New York and is known as the Former Alliance Metal Stamping and Fabrication Facility (AMSF). Figure 1 identifies the Site location. The Maguire Family Properties satisfactorily completed the remedial program and received a Certificate of Completion from the NYSDEC on December 21, 2021. However, the NYSDEC identified the potential for off-Site impacts from the contamination source located on the Site, as well as the adjacent parcel to the west of the Site. The parcel west of the Site is the ITT Corporation Site under BCP Site Code C828112 and located at 30 Pixley Industrial Parkway. At the request of the NYSDEC, Alliance is voluntarily conducting the investigation proposed in this Off-Site Investigation Work Plan (Work Plan).

CHA Consulting, Inc. (CHA) has prepared this Work Plan to investigate potential soil vapor intrusion for the building of concern located at 10 Pixley Industrial Parkway, Gates, New York and identified as TMP 119.17.1-3.2, henceforth identified as the Building. The NYSDEC specifically requested a work plan to evaluate the potential off-Site groundwater impacts from the groundwater contamination identified on the southeast portion of the Site. Section 4.0 of this Work Plan discusses general information for the supplemental groundwater investigation, but an addendum will be provided to the NYSDEC prior to commencing that work. Based on a verbal conversation with NYSDEC project manager Mr. Timothy Schneider on December 6, 2022, and in a follow-up email on the same day, the NYSDEC confirmed that Alliance would only be responsible for further defining the nature and extent of the groundwater plume trending east/southeast of the facility.

1.1 SITE BACKGROUND

The Site was developed in 1967 on previously undeveloped agricultural land. The building located on the Site was a warehouse until the early 1970s when AMSF began manufacturing and remained in operation until the 1994. In 1995, the Maguire Family Properties purchased the Site and subdivided the building to lease individual spaces to several light manufacturing and commercial tenants.

Multiple investigations and remedial actions were conducted between 1991 and 1994, and again from 2009 through obtaining the Certificate of Completion of the BCP requirements in 2021. These investigations and remedial actions are briefly described in Section 2.0. The December 2021 Final Engineering Report (FER) prepared by Stantec Consulting Services Inc. of Rochester, New York describes the interim remedial measures (IRMs) and implementation of the selected remedy for the Site. The remedial program included multiple rounds of investigation and implementation of the following components of the selected remedy:

1. Maintenance of a soil cover system which is comprised of soil in lawn and landscaped areas, soil or mulch covering a geotextile fabric demarcation layer to cover remedial berms located on the east side of the Site, crushed stone overlying soil in the unpaved strip between the southern perimeter of the parking area and the drainage ditch along Pixley Industrial Parkway, asphalt pavement, concrete-covered sidewalks, and the facility building, to prevent human exposure to remaining contaminated soil/fill.

2. Continuous operation and maintenance of the sub-slab depressurization system (SSDS) to mitigate the potential for migration of contaminated soil vapor from beneath the building footprint into the interior occupied spaces on the Site

3. A program of periodic groundwater monitoring to address and assess the remaining groundwater contamination at the Site.

4. A limited program of annual indoor air monitoring to assess the effectiveness of the SSDS component of the remedy in mitigating the potential for soil vapor intrusion in the northeast corner of the Site building.

5. Execution and recording of an Environmental Easement (EE) to restrict land use and prevent future exposure to any contamination remaining at the Site.

6. Development and implementation of a Site Management Plan (SMP) for long term management of remaining contamination as required by the EE, which includes plans for: (1) Institutional and Engineering Controls (IC/EC), (2) Monitoring, (3) Operation and Maintenance, and (4) Reporting.

7. A series of ICs is required by the Decision Document to: (1) implement, maintain and monitoring EC systems; (2) prevent future exposure to remaining contamination; and (3) limit the use and development of the Site to commercial and industrial uses only. Adherence to these ICs on the Site is required by the EE and will be implemented under the SMP. ICs identified in the EE may not be discontinued without an amendment to or extinguishment of the EE.

8. Periodic certification of the ICs and ECs listed in the EE.

The Building and associated property located at 10 Pixley Industrial Parkway for this off-Site investigation was constructed in 1967 and consists of a one-story office section and two-story garage and warehouse section surrounded by asphalt parking lots and green space. The Building is a concrete block building constructed as a slab-on-grade with no basement or crawlspace areas. The Building is currently occupied by KONE Elevator Company. Figure 2 identifies the Site and Building associated with this Work Plan.

1.2 SITE HYDROGEOLOGY

From information provided in the Remedial Investigation Report prepared by Stantec Consulting Services and dated December 2015, overburden deposits at the Site are reported to consist of an upper layer of fill material underlain by a few to several feet of glacio-lacustrine sediments which are typically underlain by a few to several feet of glacial till. The glacio-lacustrine sediments include a few to several feet of low-permeability thinly laminated clay-rich layers as well as silt and sand deposits.

The depth to the top of bedrock was found to occur from 4 to 20.5 feet below ground surface (bgs). The top of bedrock surface at the Site appears to be an irregular surface that slopes generally north to south. A relatively pronounced low is apparent on the east side of the Site.

The uppermost bedrock unit at the Site was classified as the Eramosa Dolostone of the Upper Silurian-aged Lockport Group. The Penfield Dolostone, Decew Dolostone, and the Gates Member of the Rochester Shale underlie the Eramosa Dolostone formation.

The data collected during the remedial investigation indicated the water table occurs at or below the top of bedrock during both high water-table and low water-table conditions, across most of the Site. During high water-table periods, the water table may rise a few feet into the overburden in the area along the southern and western edges of the Site and other areas where the top of bedrock surface is deeper.

Results of the remedial investigation of the adjacent ITT Site have indicated that there are three zones of distinctive groundwater flow characteristics at the Site. Within the shallow bedrock groundwater zone, the permeability is high, and flow is predominantly along fractures and zones of solution cavity development. Permeability of the underlying intermediate bedrock horizon is

reported to also be high, although not as high as the upper Eramosa. Permeability is reported to be lower in deeper bedrock units.

Results of groundwater level monitoring events performed during the remedial investigation indicated a very shallow eastward hydraulic gradient in the shallow bedrock zone across the northern half of the Site, with a somewhat steeper northeastward gradient of shallow flow in the southwestern portion of the Site. The remedial investigation data indicate that the area to the east of the eastern Site boundary is hydraulically downgradient of the AMSF Site. The Building of interest for this off-Site investigation is located to the east of the Site.

The stormwater management system for the Pixley Industrial Parkway includes multiple groundwater recharge wells. There are six recharge wells (RW-1 through RW-6) located on the two properties. The recharge wells influence the groundwater fluctuation after rain events and, therefore, groundwater investigation activities, such as well installation and sampling, should consider the impact of surface water on the water table at that time.

1.3 PROJECT TEAM

This off-Site investigation will require the expressed approval and cooperation from all parties involved. Particularly, an access agreement between Alliance Tool Company and the current tenant of 10 Pixley Industrial Parkway, KONE Elevator Company along with the property owner, is required.

Table 1-1. Project Team

Name	Contact Information
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Name	Contact Information
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Keith Cowan, P.G. CHA Consulting, Inc. Project Manager	(518) 453-2899 (O) (518) 466-8157 (C) kcowan@chacompanies.com
Karyn Ehmann CHA Consulting, Inc. Field Team Leader	(315) 257-7250 kehmann@chacompanies.com

2.0 REMEDIAL HISTORY

A detailed remedial history for the AMSF Site has been provided in several historical reports. These reports include, but are not limited to:

- Brownfield Cleanup Application, approved and executed on October 14, 2011
- Remedial Investigation Report, prepared by Stantec Consulting Services, dated December 2015
- Site Management Plan, prepared by Stantec Consulting Services, dated December 2021
- Final Engineering Report, prepared by Stantec Consulting Services, dated December 2021

A brief summary of the Site history is as follows:

- AMSF began manufacturing operations at the Site in the early 1970s and operated through 1994.
- From 1991 to 1994, investigations identified contamination of groundwater by tetrachloroethylene (PCE), a chlorinated volatile organic compound (VOC) commonly used as a degreasing or dry-cleaning solvent in samples from wells located along the southern perimeter of the Site.
- In 1994, contaminated soil in four areas of the Site were addressed by excavation and removal. Post excavation sampling indicated residual contamination was not present.
- In April 2009, the adjacent ITT Site remedial investigation (BCP C828112) included a soil vapor intrusion investigation in the AMSF building. Elevated PCE concentrations in sub-slab vapor on the northeast portion of the building were identified at higher concentrations than the ITT Site building and was found to be attributed to contamination from a former degreaser location in the AMSF building.
- In March 2012, a remedial investigation under the BCP was initiated. Chlorinated VOC contamination was identified in soil, groundwater, and soil vapor.
- An IRM SMP was developed, and monitoring activities began in February 2016.
- In 2017, a SSDS design was completed. An approximately 35,000 square foot portion of the building, including the area where the degreaser pit is located, became vacant. At that time, a SSDS system utilizing nine suction points was installed.
- In 2019, an IRM Work Plan was developed to implement two remedial actions: (1) installing an SSDS that covers the entire building and (2) plugging the deep bedrock interval of the recharge well RW-2. Additionally, the IRM Work Plan specified a pre-design investigation to supplement surface soil sampling.
- The surface soil sampling effort identified benzo(a)pyrene in exceedance of the Part 375 Commercial Use Soil Cleanup Objectives and, therefore, a Cover System IRM was

developed to address cover system conditions in vegetated areas on the east and south side of the Site.

- In 2021, a FER and SMP was developed which includes provision for groundwater monitoring and indoor air monitoring at the Site and a Certificate of Completion was received.

3.0 SOIL VAPOR INTRUSION INVESTIGATION

The proposed soil vapor intrusion (SVI) investigation will be conducted in accordance with the New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006 with updates through May 2017. The following sections summarize the proposed investigation.

3.1 BUILDING SURVEY

An initial site visit including indoor air screening and building survey will be conducted prior to selecting the exact locations for indoor, outdoor, and sub-slab vapor sampling. CHA will identify potential sources of VOCs associated with operations at the facility that may impact the indoor air sampling results using a RAE Systems ppbRAE photoionization detector (PID). A building survey questionnaire will be completed that includes square footage of each area, heating, ventilation and air conditioning information for the building, if applicable, building occupancy, and use of each space. A chemical inventory of potential sources of indoor air contamination will be developed to compare to analytical results from this sampling effort. Proposed locations are presented on Figure 3, but the locations may be moved based on building layout, foundation type, utilities, and locations of elevated PID readings without an obvious source, if applicable. Any proposed changes to the locations will be identified and communicated to NYSDEC following the initial site visit and building survey.

3.2 INDOOR AND OUTDOOR AMBIENT AIR SAMPLING

CHA will return to the Site to conduct the sampling program. Indoor air (IA) sampling will include collection of four indoor air samples from within the various sections of the building, identified on Figure 3. The indoor air samples will be in placed in routinely occupied areas within the Building.

In addition to the above-referenced indoor air samples, CHA will collect the following samples:

1. One duplicate sample will be collected at a location selected by CHA for quality control purposes. No other quality assurance/quality control sampling is proposed for this initial screening.
2. One outdoor air (OA) sample will be collected in a generally upwind location on the exterior of the building.

3.2.1 Sample Collection

The air samples will be collected in 2.7-liter SUMMA canisters provided by and certified to be clean by the selected laboratory. The canisters will be equipped with flow regulators to limit the maximum sampling rate to 0.2 liters per minute, per the NYSDOH guidance. The sample canisters will be placed at approximately breathing height (ex. three to five feet above the ground) and the inlet valve will be opened fully. The samples will be collected over an approximately eight-hour sampling period. The start and stop time and initial and final vacuum readings for each canister will be recorded in the field. The vacuum pressure in each canister will be routinely monitored during the sampling event, when practical, to identify potential issues with the SUMMA canister. The sample collection should be stopped after the scheduled duration, but when the canister still has some vacuum reading. Following sample collection, the canisters will be closed tightly and transmitted to NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory under a signed and dated chain of custody and will be analyzed for the presence of VOCs at a certified laboratory via United States Environmental Protection Agency (EPA) Method TO-15 selective ion monitoring (SIM).

3.3 SUB-SLAB VAPOR SAMPLING

The sub-slab vapor (SSV) sampling will include collection of four sub-slab vapor samples in the proposed locations identified on Figure 3.

3.3.1 Vapor Point Installation

Sub-slab vapor probe installations will be temporary or semi-permanent based on discussion with the Owner of the Building. The sub-slab vapor sampling points will be installed by coring a minimum ½ inch diameter hole through the floor slab. A vacuum will not be used to remove drilling debris from the sampling port. Sub-slab implants or probes will be constructed in the same manner at all sampling locations to minimize possible discrepancies and may be temporary or semi-permanent sampling probes. Temporary probes will be constructed with inert tubing (e.g., polyethylene stainless steel, nylon, Teflon®, etc.) of the appropriate size (typically ¼ inch diameter), and of laboratory or food grade quality. Tubing will not extend further than 2-inches into the sub-slab material. The implant will be sealed to the surface with non-VOC-containing and non-shrinking products for temporary installations (e.g., perma-gum grout). Semi-permanent sampling probes are constructed of stainless steel with a silicone sleeve and can be installed flush to the concrete slab.

3.3.2 Purging Procedures

After installation of the probes, three volumes (i.e., the volume of the sample probe and tube) will be purged prior to collecting the samples to ensure samples collected are representative. Flow rates for purging will not exceed 0.2 liters per minute to minimize the ambient air infiltration during sampling. During purging of the sample point, a tracer gas evaluation will be conducted to verify the integrity of the sub-slab soil vapor probe seal. An enclosure will be constructed around the sub-slab sampling point (e.g., plastic bag, plastic bucket, etc.) and sealed around the sample point casing. Subsequently, the enclosure will be enriched with helium, a tracer gas not typically identified in natural environments. The purged sub-slab vapor will then be tested for the tracer gas by a MDG 2002 Helium Leak Detector. In the event that helium is measured at a concentration of 10% or greater, the sample point will be resealed and retested prior to sampling.

3.3.3 Sample Collection

The air samples will be collected in 2.7-liter SUMMA canisters provided by and certified to be clean by the selected laboratory. The canisters will be equipped with flow regulators to limit the maximum sampling rate to 0.2 liters per minute, per the NYSDOH guidance. The sample canisters will be placed on the ground adjacent to the sub-slab vapor point and connected to the vapor point with inert tubing. The samples will be collected over an approximately eight-hour sampling period. The start and stop time and initial and final vacuum readings for each canister will be recorded in the field. The vacuum pressure in each canister will be routinely monitored during the sampling event, when practical, to identify potential issues with the SUMMA canister. The sample collection should be stopped after the scheduled duration, but when the canister still has some vacuum reading. Following sample collection, the canisters will be closed tightly, disconnected from the vapor point, and transmitted to NYSDOH ELAP-certified laboratory under a signed and dated chain of custody and will be analyzed for the presence of VOCs at a certified laboratory via EPA Method TO-15 SIM.

3.4 SUMMARY OF PROPOSED SAMPLING

The following table identifies the types of samples, sampling nomenclature, analysis, number of parent and duplicate samples, and additional information necessary to properly conduct the SVI investigation.

Table 3-1. Sampling Summary

Type of Sample	Sample Nomenclature	Analysis	Number of Primary Samples	Number of Duplicates	Container Type	Technical Holding Time
Indoor Air	IA-01-DATE through IA-02-DATE (CHA-1-DATE)	EPA Method TO-15 SIM	4	1	2.7 Liter SUMMA Canister with 8-hour flow regulator	30 Days
Outdoor Air	OA-01-DATE	EPA Method TO-15 SIM	1	0	2.7 Liter SUMMA Canister with 8-hour flow regulator	30 Days
Sub-Slab Vapor	SV-01-DATE through SV-04-DATE	EPA Method TO-15 SIM	4	0	2.7 Liter SUMMA Canister with 8-hour flow regulator connected to a sub-slab vapor point	30 Days

4.0 GROUNDWATER INVESTIGATION

Given the Department's desire to complete the soil vapor intrusion investigation in a timely manner, an addendum discussing the technical aspects of the Off-Site Groundwater Investigation will be prepared and submitted for NYSDEC review prior to commencing work. Generally, the groundwater investigation will include:

1. Installation and development of three new shallow bedrock monitoring wells in approximate locations identified on Figure 3.

2. Monitoring wells are anticipated to be installed approximately 30 feet below ground surface, but final depth will be determined in the field based on bedrock conditions identified. The monitoring wells will be constructed similarly to the existing monitoring wells at the Site.

3. Sampling of the newly installed monitoring wells for Target Contaminant List (TCL) VOCs via EPA Method 8260.

4. CHA will make an effort to coordinate with the consultant performing groundwater monitoring at the Site to conduct groundwater sampling and obtain groundwater levels at approximately the same time in order to have comparable data.

5. Evaluation of the available groundwater data collected during the 2022 and 2023 groundwater sampling events at the Site and comparison with the data gathered from the newly installed groundwater monitoring wells on the off-site property.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

The overall QA objective is to develop and implement procedures for sample preparation and handling, sample COC, laboratory analyses, and reporting, in order to provide accurate data. Specific procedures to be followed for sampling, sample custody and document control, calibration, laboratory analyses and data reduction, validation, assessment and reporting are presented in Section.

The purpose of this Section is to define the goals for the level of QA effort; namely, accuracy; precision and sensitivity of analyses; and completeness, representativeness and comparability of measurement data from the analytical laboratories. QA objectives for field measurements are also discussed.

Accuracy, Precisions and Sensitivity of Analyses

The fundamental QA objective with respect to the accuracy, precision and sensitivity of analytical data is to achieve the QC acceptance of each analytical protocol. The method precision (relative percent difference (RPD) of duplicate analysis) will be determined from the duplicate analyses of one blind duplicate indoor air sample. One blind duplicate and one matrix spike/matrix spike duplicate (MS/MSD) sample set will be collected during the groundwater sample event.

Completeness, Representativeness and Comparability

It is expected that all analyses conducted in accordance with the selected methods will provide data meeting QC acceptance criteria for 80 percent of all samples tested. Any reasons for variances will be documented.

The sampling program has been designed to provide data representative of Site conditions. During development of these networks, consideration was given to location of historic activities, existing data from past studies completed for the Site and the physical Site setting. The extent to which existing and planned analytical data will be comparable depends on the similarity of sampling and analytical methods. Comparability of laboratory analyses will be ensured by the use of consistent units. Following completion of data collection, the existing database will be evaluated for representativeness.

5.1 FIELD QA/QC

Calibration of the field instruments will be completed prior to each day's use in accordance with the manufacturer's instructions. During groundwater sampling activities if the data indicates a change (>±10 percent) in pH and/or conductivity from the last location sampled, the field equipment will be recalibrated. The field equipment will be maintained, calibrated and operated in a manner consistent with the manufacturer's guidelines and EPA standard methods. However, since the majority of field measurements will be limited to organic vapor readings (PID readings), pH, conductivity, turbidity, and depth (water level) the calibration procedures will be conducted at a minimum frequency of once per day. Records of calibration, repair or replacement will be filed and maintained by the field team.

Pertinent field survey and sampling information shall be recorded in a logbook or on field logs during each day of the field effort per CHA SOP#101 Field Logbook and Photographs, provided in Appendix A of this Work Plan.

At a minimum, entries in a logbook shall include:

- Date and time of starting work;
- Names of all personnel at site;
- Weather conditions
- Purpose of proposed work effort;
- Sampling equipment to be used and calibration of equipment;
- Description of work area;
- Location of work area, including map reference;
- Details of work effort, particularly any deviation from the field operations plan or standard operating procedures;
- Field observations;
- Field measurements (e.g., Photoionization Detector (PID) readings);
- Field laboratory analytical results;
- Daily health and safety entries, including levels of protection;
- Type, number, and location of samples;
- Sampling method, particularly deviations from the standard operating procedures;
- Sample location and number; and
- Sample handling, packaging, labeling, and shipping information (including destination).

In addition to keeping logs, photographs will be taken to provide a physical record to augment the fieldworker's written observations. For each photograph taken, several items shall be recorded in the field logbooks:

- Date and time;
- Name of photographer;
- General direction faced and description of the subject

The general QA objective for measurement data is to obtain reproducible and comparable measurements to a degree of accuracy consistent with the use of standardized procedures.

5.2 CHAIN OF CUSTODY

As per CHA SOP#105, a chain of custody (COC) will be maintained to document the transfer of all samples. Each sample container will be properly sealed. Sample container labels will include the sample name, required analysis, and date and time of collection. Sample containers will be taken to the Contract Laboratory courier center.

Each box of samples will contain an appropriately completed COC form. One copy will be returned to CHA upon receipt of the samples by the laboratory. One copy will be returned to CHA with the data deliverables package.

Upon receipt of the cooler at the laboratory, it will be inspected by the designated sample custodian. The condition of the sample containers will be noted on the COC record sheet by the sample custodian. The sample custodian will also document the date and time of receipt of the container and sign the form.

If damage or discrepancies are noticed, they will be recorded in the remarks column of the record sheet, and be dated and signed. Any damage or discrepancies will be reported to the lab supervisor who will inform the lab manager and CHA Project Manager.

5.3 LABORATORY QA/QC

Each sample or group of samples shipped to the laboratory for analysis will be given a unique identification number by the laboratory. The laboratory sample custodian will record the client name, number of samples and date of receipt of samples in the Sample Control Log Book.

The Contract Laboratory will be responsible for maintaining analytical log books and laboratory data as well as sample inventory on hand for submittal to CHA on an "as required" basis. Samples will be maintained by the laboratory for a period of 30 days, under the conditions prescribed by the appropriate USEPA methods, for additional analyses, if necessary. Raw laboratory data files will be inventoried and maintained by the Contract Laboratory for a period of five years, at which time CHA will advise them as to the need for additional storage.

Specific procedures related to internal laboratory QC samples are described in the following subsections. Per EPA Method TO-15, a method blank, laboratory control sample, and laboratory duplicate is required for each batch. MS/MSD samples are not required for EPA Method TO-15.

Groundwater samples submitted to the laboratory will include the following internal laboratory QC samples: method blank, laboratory control sample, laboratory duplicate, surrogate analysis, and MS/MSD samples.

Method Blank Sample

A method blank is used to evaluate potential contamination from the laboratory and is processed through all preparation and analytical steps with the batch of samples. A method blank is processed at a minimum frequency of one per 20 samples. The method blank consists of a matrix similar to the associated samples that is known to be free of the analytes of interest. Laboratories will characterize a representative air sample as “clean” if the sample contains contaminant concentrations at less than half of the reporting limit for that parameter. Each method blank is evaluated, and the source of any contamination is investigated. Corrective actions taken in the event a target analyte is detected at more than half the reporting limit will be documented. Corrective actions may include re-preparation and re-analysis of all samples (if possible). Data qualifiers must be applied to any result reported that is associated with a contaminated method blank.

Laboratory Control Sample

The Laboratory Control Sample (LCS) is used to evaluate the performance of the entire analytical system including preparation and analysis. An LCS is processed at a minimum frequency of 1 per preparation batch. In the case of a method that has no separate preparation step (e.g. volatiles), an LCS will be processed with no more than 20 samples of a specific matrix performed by the same analyst, in the same method, using the same standards or reagents.

The LCS consists of a matrix similar to the associated samples that is known to be free of the analytes of interest that is then spiked with known concentrations of target analytes. The LCS is evaluated against the laboratory-derived acceptance criteria.

Matrix Spike/Matrix Spike Duplicate Samples

An MS/MSD sample will be analyzed at a minimum frequency one sample for every 20 investigative samples that are collected. For sampling events consisting of less than 20 investigative samples, one MS/MSD sample set will be collected. Acceptable criteria and compounds that will be used for matrix spikes are identified in the appropriate methods. Percent spike recoveries will be used to evaluate analytical accuracy while percent relative standard deviation or the RPD between matrix spike analyses will be used to assess analytical precision.

Surrogate Analysis

Surrogates are organic compounds which are similar to the analytes of interest, but which are not normally found in environmental samples. Surrogates are added to samples, by the laboratory, to monitor the effect of the matrix on the accuracy of the analysis. Every blank, standard and environmental sample analyzed by GC or GC/MS, including MS/MSD samples, will be spiked with surrogate compounds prior to sample preparation.

Surrogates will be spiked into samples according to the appropriate analytical methods. Surrogate spike recoveries will be compared with the control limits set by procedures specified in the method (or from laboratory specific control limits) for analytes falling within the quantification limits without dilution. Dilution of samples to bring the analyte concentration into the linear range of calibration may dilute the surrogates out of the quantification limit; assessment of analytical quality in these cases will be based on the quality control embodied in the check and MS/MSD samples.

5.4 DATA USABILITY SUMMARY REPORT

A qualified third party will conduct an independent evaluation of the Category B data reduction and reporting by the laboratory. The data validation will be performed in accordance with the following documents: "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review EPA 540/R-99-008, October 1999" and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review EPA 540/R-04-004, October

2004". Data analyzed using methods not covered in these documents will be validated using the general principles used in these documents, and the analytical requirements specified in the methods pertaining to USEPA Region 2 Data Validation.

6.0 DATA EVALUATION

6.1 SOIL VAPOR INTRUSION

The results of the SVI investigation will be compared to the applicable NYSDOH Decision Matrices, revised May 2017, and the air guideline values provided on Table 3.1 of the NYSDOH SVI Guidance Document. For compounds not identified on the decision matrices, the databases with statistical measures of background concentrations from the NYSDOH and EPA may be used to evaluate detected compounds. The background levels area provided in Appendix C of the NYSDOH SVI Guidance Document.

Additional information that will be considered during the data evaluation will include the building survey information including chemical inventory and the upwind outdoor air background sample.

6.2 GROUNDWATER

Results of the groundwater investigation will be compared to the *Technical and Operational Guidance Series* (TOGS) 1.1.1. Glass GA Ambient Water Quality Standards and Guidance Values. Additional information regarding data evaluation will be provided in an addendum to this Work Plan.

7.0 HEALTH AND SAFETY PLAN

A site-specific Health and Safety Plan (HASP) was prepared following an assessment of known physical and chemical hazards present at the site and an evaluation of the risks associated with the assessment and remedial actions. Available site information was examined and adequate warnings and safeguards for field personnel were selected and implemented. All CHA field personnel are required to review and sign the HASP before entering the field. Subcontractors to CHA are required to develop and implement their own HASP. A copy of the site-specific HASP is provided in Appendix B.

8.0 COMMUNITY AIR MONITORING PLAN

Due to the limited intrusive activity associated with this work and sub-slab vapor sampling points installed within an enclosed building, there is no need for a Community Air Monitoring Plan (CAMP) for the soil vapor intrusion investigation. An addendum to this work plan describing the groundwater investigation in more detail will be submitted to the NYSDEC for approval prior to beginning that work. At that time, a CAMP will be developed in association with the proposed monitoring well installation.

9.0 SCHEDULE

The following table provides an estimated schedule to complete the investigation described in this work plan. The overall progress of the project will be dependent upon a number of factors including, but not limited to, NYSDEC review and approval timeframes, time of year during which the field work commences, availability of subcontractors, and coordination with the Owner of 10 Pixley Industrial Parkway.

Table 9-1. Project Schedule

Description of Activity	Estimated Timeline
Request for Access for the 10 Pixley Industrial Parkway Property	Begin January 2023
Soil Vapor Intrusion Investigation and Preparation of Final Report	6 Weeks Following Access Approval
Addendum to this Off-Site Investigation Work Plan to address groundwater	6 Weeks Following Access Approval
Implementation of Groundwater Investigation and Preparation of Final Report	12 Weeks Following Access Approval

10.0 REPORTING

Upon completion for the SVI investigation, CHA will prepare a letter report presenting a summary of field activities, analytical results with comparison to the applicable NYSDOH Decision Matrices, and conclusions and recommendations regarding the potential off-Site impact of chlorinated VOC contamination on the Building. The report will include a qualitative exposure assessment, as described in Section 8.1.

Upon completion of groundwater investigation activities, CHA will prepare a letter report presenting a summary of field activities, analytical results, and conclusions and recommendations regarding potential off-Site impact to groundwater. In accordance with the SMP, annual groundwater monitoring is occurring at the Site. CHA will evaluate the data obtained during the 2022 annual groundwater sampling event and prepare updated groundwater isocontentration maps. Additional information regarding the report requirements will be included in an addendum prepared prior to groundwater investigation activities.

10.1 QUALITATIVE EXPOSURE ASSESSMENT

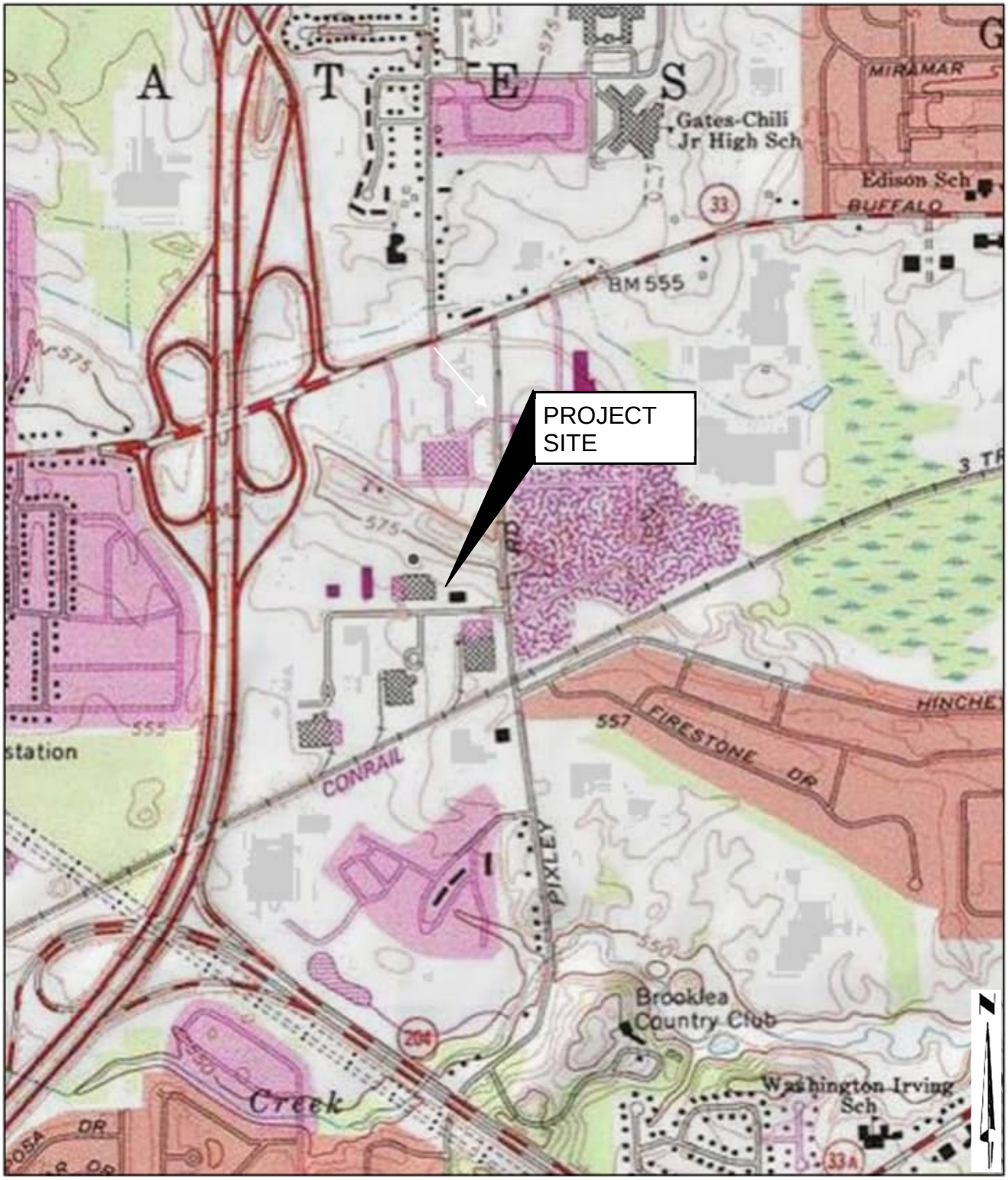
A qualitative human health exposure assessment will be completed to identify areas of concern and contaminants of concern, evaluate potential exposure pathways, characterizes the potentially exposed receptors, and identifies how any unacceptable exposures might be eliminated/mitigated. The five elements of an exposure pathway include:

1. The source of contamination;
2. The environmental media and transport mechanisms;
3. Point of exposure;
4. Route of exposure; and,
5. Receptor population.

The potentially exposed receptors and how any unacceptable exposures may be eliminated are determined from an assessment of the primary use of the area (e.g., residential, industrial, or recreational), actual and potential use of ground and surface waters that are impacted or threatened, and how any potential routes of exposure may be eliminated. The current, proposed or reasonably anticipated future use of the area should be used in this assessment.

FIGURES

The National Map Advanced Viewer



V:\Projects\ANY\K6\080117.000\08_Reports\Off-Site Investigation Work Plan\DRAFT\Figures\Figure 1 - Site Location Map.docx

CHA
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SITE LOCATION MAP

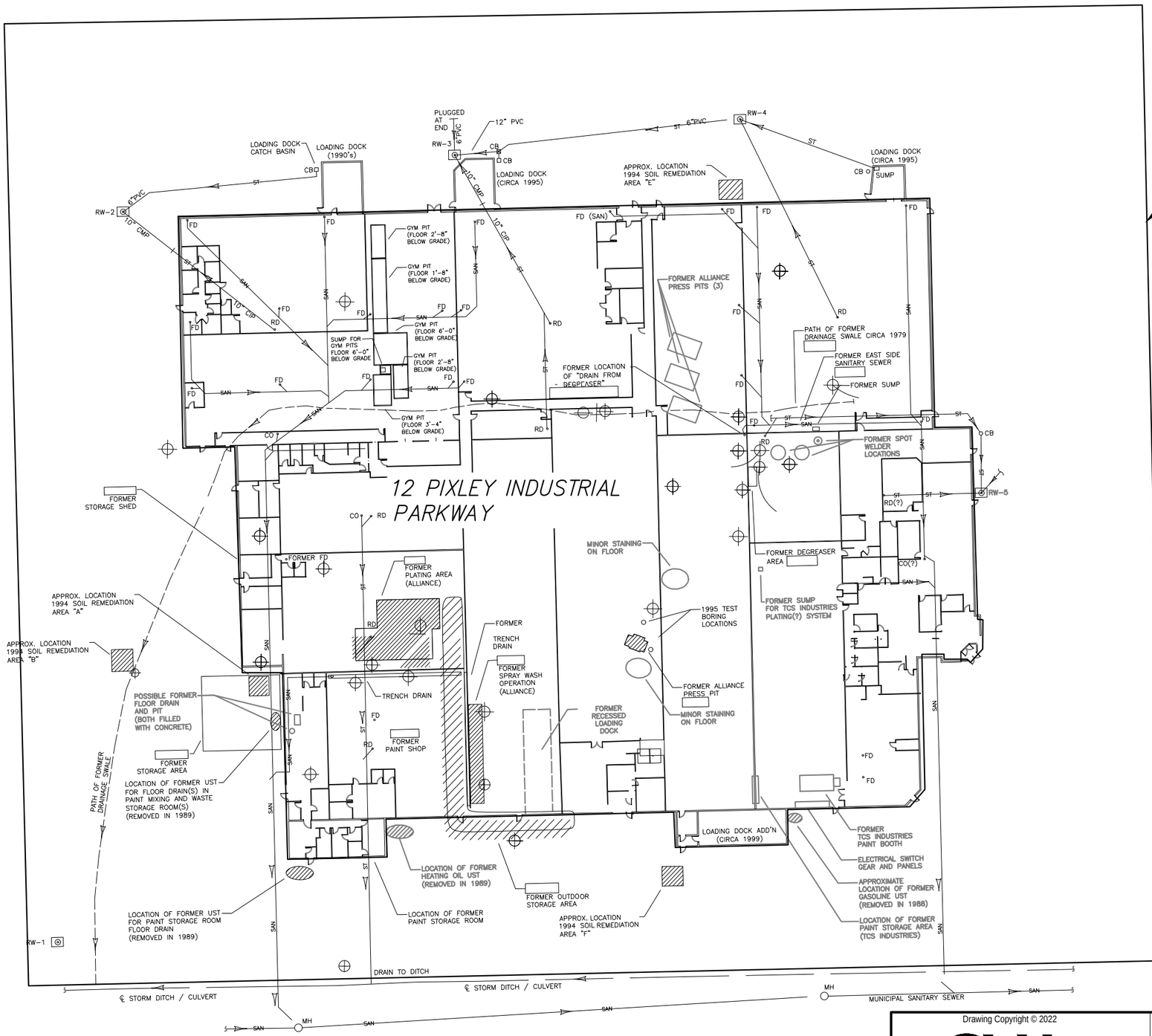
SOIL VAPOR INTRUSION WORK PLAN

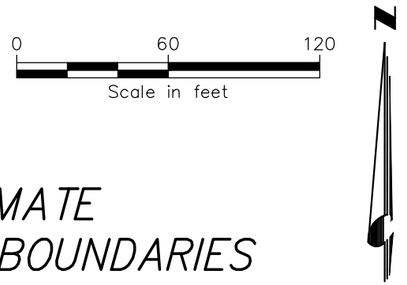
10 PIXLEY INDUSTRIAL PARKWAY, GATES, NEW YORK

PROJECT NO. 080117.000

DATE: 12/2022

FIGURE 1





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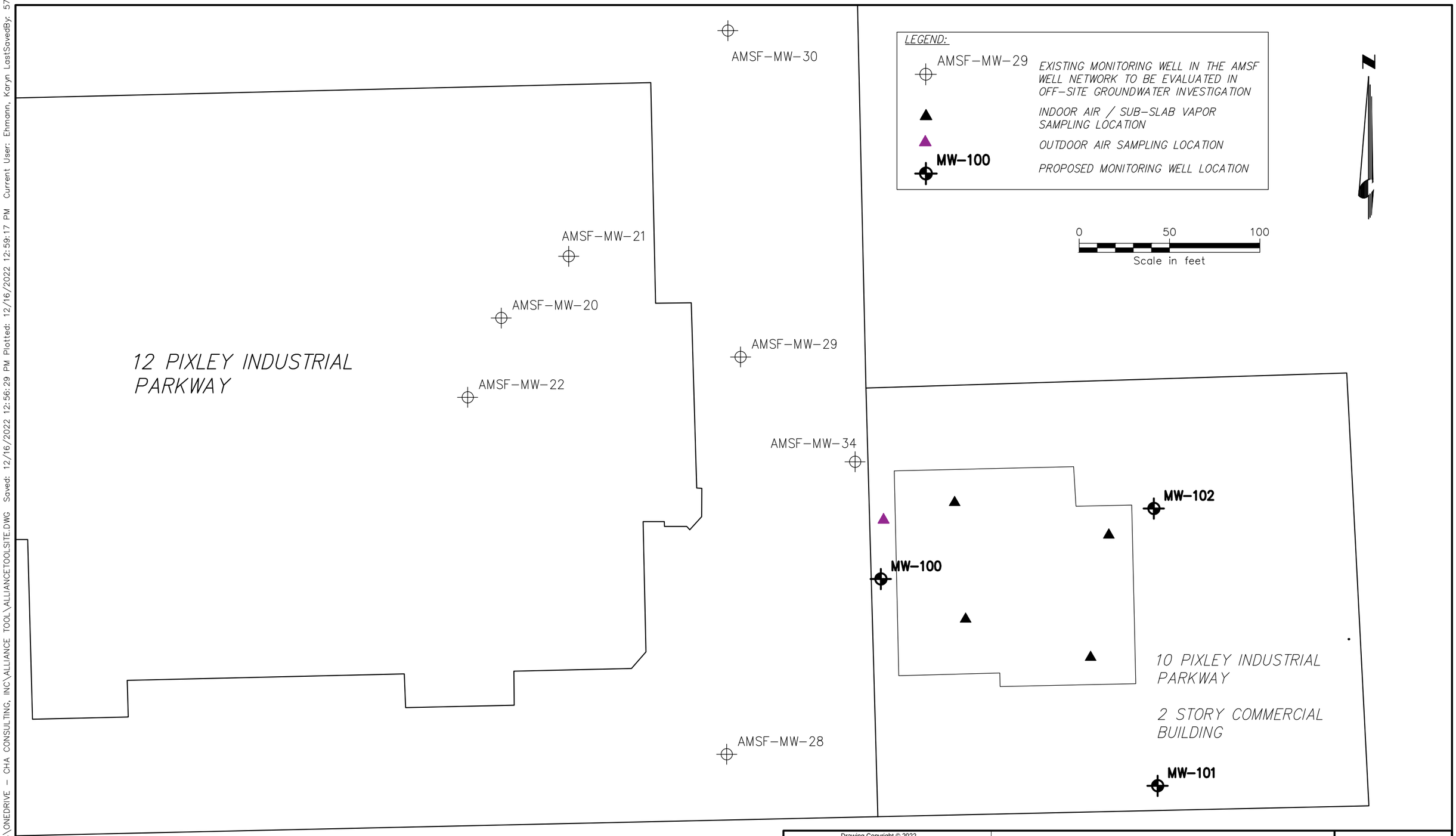
SITE LAYOUT MAP

10 AND 12 PIXLEY INDUSTRIAL PARKWAY, GATES, NEW YORK

PROJECT NO. 080117.000

DATE: 12/2022

FIGURE 2



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SAMPLING LOCATION PLAN

10 AND 12 PIXLEY INDUSTRIAL PARKWAY
GATES, NEW YORK

PROJECT NO. 080117.000

DATE: 12/2022

FIGURE 3

APPENDIX A

CHA Standard Operating Procedures

FIELD LOGBOOK AND PHOTOGRAPHS

A. PURPOSE/SCOPE:

To produce an accurate and reliable record of all field activities, including field observations, sample collection activities, etc.

All pertinent field survey and sampling information shall be recorded in a logbook or on field logs during each day of the field effort.

In addition to keeping logs, photographs will be taken to provide a physical record to augment the field worker's written observations. They can be valuable to the field team during future inspections, informal meetings, and hearings. Photographs should be taken with a camera-lens system having a perspective similar to that afforded by the naked eye. A photograph must be documented if it is to be a valid representation of an existing situation.

B. EQUIPMENT/MATERIALS:

- Bound Field Book (with waterproof paper) or Field Logs
- Chain-of-Custody, Other Appropriate Forms
- Indelible Ink Pens
- Digital Camera with 50 mm lens or similar.

C. PROCEDURE:

1. At a minimum, entries in a logbook shall include:
    a. Date and time of starting work
    b. Names of all personnel at site
    c. Summary of key conversations with contractors, agency representatives, etc.
    d. Purpose of proposed work effort
    e. Sampling equipment to be used
    f. Field calibration of equipment or documentation of calibration of rented equipment
    g. Description of work area
    h. Location of work area, including map reference. Document sample locations with references to fixed landmarks (e.g., 10 feet from southwest corner of building).
    i. Details of work effort, particularly any deviation from the field operations plan or standard operating procedures
    j. Field observations and field measurements (e.g., pH)
    k. Field laboratory analytical results
    l. Personnel and equipment decontamination procedures
    m. Daily health and safety entries, including levels of protection
    n. Type and number of samples

FIELD LOGBOOK AND PHOTOGRAPHS

o. Sampling method, particularly deviations from the standard operating procedures

p. Sample location and number

q. Sample handling, packaging, labeling, and shipping information (including destination)

r. Time of leaving site.

For each photograph taken, several items shall be recorded in the field logbooks:

a. Date and time – Camera set to record on photo

b. Name of photographer

c. General direction faced and description of the subject

d. Sequential number of the photograph

e. Always attempt to include an object in the photograph that helps show scale

f. Always try to shoot at approximately 50mm focal length (what human eye sees).

2. Each day's entries will be initialed and dated at the end by the author, and a line will be drawn through the remainder of the page.

D. QA/QC REQUIREMENTS:

All entries in the logbook shall be made in indelible ink. All corrections shall consist of single line-out deletions that are initialed.

The field task leader shall be responsible for ensuring that sufficient detail is recorded in the logbooks, and shall review the site logbooks daily.

E. SPECIAL CONDITIONS:

Photographs should be downloaded from the camera to the project folder and notes regarding the photographs should accompany the photos. Photographs should be no larger than 2 MB each unless they are being utilized for presentation purposes. CHA has software available to decrease file sizes if necessary.

As noted above, if a bound logbook is not used, then a field observation form must be used and information above should be captured on the form.

F. REFERENCES:

None

G. APPENDICES/FORMS:

Not Applicable

END OF SOP
Final Check by C. Burns 10/2/15

Author: Sarah Newell, Mark Corey
Reviewer: Keith Cowan, Sandy Warner

COMPLETING A CHAIN-OF-CUSTODY RECORD

A. PURPOSE/SCOPE:

This protocol provides a standard operating procedure (SOP) for initiating and maintaining a Chain of Custody (COC) document. A COC is a legal document designed to track persons who are responsible for the preparation of the sample container, sample collection, sample delivery, sample storage, and sample analysis. A COC is an appropriate format to record important data associated with each individual sample. In general, a sample requiring a COC will follow a path as follows:

Sample Collector → Sample Courier/Operator → Sample Custodian

Verification of who has possessed the samples and data and where the samples have been is completed when staff follow chain-of-custody procedures.

B. EQUIPMENT/MATERIALS:

- Chain of Custody form
- Ball-point, permanent pens
- Gallon-Sized Ziploc Bag (to keep COC dry)
- Field Logbook
- Custody seals
- Padlock(s) (optional)

C. PROCEDURE:

1. Once a sample has been determined to require a COC, the Sample Collector must initiate the COC. The Sample Collector must fill in the fields provided on the COC. The words "Chain of Custody" must be located in a conspicuous location at the top of the document.
2. The form is generally a three-page carbon copy document, including a white, yellow and pink sheet. While CHA generally uses COCs provided by the applicable laboratory, it is important to ensure that the COC from each lab contains places for all necessary information.
3. The COC at that time should include the fourteen-digit CHA project number and phase, the project name and location.
4. The Client Information Section must be completed. In most cases the "client" will be CHA Consulting, Inc.
5. The first field of information is the Sample Identification or Sample Identification Number. This identification/number must match the identification/number located on the sample container.
6. An information line for the date, time, phone number, printed name of Sample Collector, signature of Sample Collector, organization name (no acronyms), organization's full mailing address, and sample description must also be included.
7. Sampling personnel should enter the sample number(s) (which should correspond with a unique number on a sample container [SOP #103] if applicable, and parameters to be analyzed. The "Sample ID" must be included and must match the number on the sample.

COMPLETING A CHAIN-OF-CUSTODY RECORD

8. Subsequent fields must be provided to allow for documentation of information about any subsequent Sample Couriers/Operators or Sample Custodians. These fields must contain the date, time, phone number, printed name of person taking custody of sample, signature of person taking custody of sample and organization name (no acronyms).
9. Field Information - The COC must contain places to enter the following field information: sample number, sampling date, and type of sample. Other field information may be recorded as specified in the field sampling plan or proposal for the project. It is imperative that there be only one sample with a particular sample number per project/study so as to prevent duplicates in Excel files and EQuIS databases.
10. Laboratory Information - Once the sample is delivered to the lab, the laboratory personnel will sign and date the "received by" line located at the bottom of the COC. Other laboratory information may be recorded as specified in the project/study work plan/proposal.
11. Signatures - The COC must contain places for all people who handle the sample to sign his/her name. This is a record of persons who had custody of the sample during all steps of the process from container preparation, sample collection, sample storage and transport, and sample analysis. There should be signature lines to relinquish custody of the sample and to receive custody of the sample.

D. QA/QC REQUIREMENTS:

The Field Team Leader or senior person on the sampling team will review the completed COC form to verify that all fields are properly completed. For purposes of this SOP, signing the form under Collected/Delivered by is considered evidence that the COC form has been checked for accuracy and completeness.

E. SPECIAL CONDITIONS:

Whenever samples are split with a source or government agency, a separate chain of custody form should be completed for the samples and the relinquisher (sampler) and recipient should sign. If a representative is unavailable or refuses to sign for the samples, this can be noted in the “remarks” area of the form. When appropriate, as in the case where the representative is unavailable, the custody record should contain a statement that the samples were delivered to the designated location at the designated time. A copy of the chain of custody form for split samples must be kept with the project file.

Samples may require short term storage in field locations prior to delivery to the laboratory for analyses. The storage may be in vehicles or lodging locations. The samples must be secured to limit access to them. A locked vehicle is considered controlled access. However, simply a locked lodging room is not secure due to potential custodial access. If an unattended lodging room is used for sample storage, the samples must be further secured. This may entail a padlock on the ice chest, samples in an ice chest secured in an inner bag with a custody seal on it, and/or ice chest taped shut with custody seal on the outside of it.

F. REFERENCES:

Sampling Guidelines and Protocols, NYSDEC, http://www.dec.ny.gov/regulations/2636.html
Chain of Custody Protocol is in Appendix 5X.2.

COMPLETING A CHAIN-OF-CUSTODY RECORD

Chain of Custody Procedures for Samples and Data, EPA 50 minute Self Instructional Course:
http://www.epa.gov/apti/coc/

SOP for Chain of Custody, EPA Region 1:
http://www.epa.gov/region6/qa/qadevtools/mod5_sops/misc_docs/r1_chain-of-custody.pdf

G. APPENDICES/FORMS:

CHA COC Form

END OF SOP
Final Check by C. Burns 10/7/15

Author: Meghan Platt, P.E.
Reviewer: Scott Smith, P.E.

SAMPLE CONTAINERS, VOLUMES, PRESERVATIONS AND HOLDING TIMES

A. PURPOSE/SCOPE:

The following standard operating procedure (SOP) presents general guidelines for sample containers, volumes, preservations and holding times associated with air, water and soil/sediment samples. Field personnel are responsible for ensuring that state-specific standards/guidelines/regulations are followed, where applicable.

Improper preserving, storing and handling of air, water and soil/sediment samples are critical if the integrity of the samples are to be maintained. Samples collected in the field may undergo biological, chemical or physical changes following removal from their environment. In order to minimize those changes, many samples must have preservatives in the form of strong acids or bases added prior to delivery to the laboratory. If samples are to be collected as part of a government program, the governing agency typically must be notified 30 days prior to sample collection.

B. EQUIPMENT/MATERIALS:

Pre-cleaned sample containers along with associated preservations within the sample containers will be provided to CHA from the analytical laboratory. The field geologist/engineer will provide the necessary personal protective equipment to place samples collected within the appropriate sample containers per SOPs 300 through 417. However, if field preservation is required the following equipment and materials shall be obtained:

- Hydrochloric (HCl) Acid Reagent A.S.C. 38%
- Nitric (HNO3) Acid Reagent A.S.C. 71%
- Sodium Hydroxide (NaOH) 97%
- 10 mL glass pipettes
- Narrow range (0-3 and 12-14) pH paper
- Nitrile gloves

C. PROCEDURE:

1. Review Table 1 which details typical parameters of interest at environmental sites and the associated methods, preservation, container type, holding time and required sample volume.
2. Obtain pre-cleaned and pre-preserved sample containers from the laboratory. If pre-preserved sample containers were provided skip to Step 7; if not proceed to Step 3.
3. Put on a clean pair of nitrile gloves.
4. In a clean, non-dusty environment, remove the cap of the sample container.
5. Using a clean, 10 mL glass pipette draw the required amount of acid or base and insert into the sample container.
6. Volatile Organic Compounds – 2 mL of HCl acid (water samples).
7. Total and Dissolved Metals (including mercury) – 5 mL Nitric acid (water samples).
8. Cyanide – 15-20 Sodium Hydroxide pellets (water samples).

9. Chemical Oxygen Demand, Oil and Grease, Organic Carbon, Phenolics, Total Dissolved Phosphorous, Hydrolyzable Phosphorus, Ammonia, Nitrate and Nitrite – 5 mL Sulfuric acid (water samples).
10. Immediately replace and tighten the sample container cap.
11. Collect sample using equipment and procedures outlined in other SOPs as appropriate. The volume of the sample collected shall be sufficient to conduct the analysis required, as well as associated quality assurance/quality control samples (QA/QC). QA/QC samples shall be collected in accordance with SOP 605.
12. Place samples immediately in the pre-preserved sample containers.
13. Chill all samples to 4ºC from sample collection until laboratory analysis.
14. Package and ship samples per SOP #607.

D. QA/QC REQUIREMENTS:

This section includes QA/QC requirements associated with sample containers, volumes, preservations, and holding times. The following general requirements apply to this SOP:

1. All data must be documented on field data sheets or within site logbooks.
2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan.
3. Equipment checkout and calibration activities must occur prior to sampling/operation, and must be documented.
4. QA/QC samples shall be collected in accordance with SOP 605.

The following procedure shall be conducted to provide a QA/QC check of water (aqueous) samples to ensure the samples were preserved to the proper pH prior to shipping for laboratory analysis.

Volatile Organic Compounds:

1. Collect one additional VOA vial at every third aqueous sampling location.
2. Fill the extra vial with the sample.
3. Using the extra VOA vial, remove the cap and using a clean, 10 mL glass pipette extract approximately 1 mL of water.
4. Place two drops of the water on a 1-inch strip of 0-3 range pH paper.
5. Compare pH strip's color while wet with that of the color key included on the pH paper container.
6. If pH is not less than 2, add additional HCL to the remaining 3 VOA vials prior to collecting the sample.
7. Discard the vial used to check the pH.

SAMPLE CONTAINERS, VOLUMES, PRESERVATIONS AND HOLDING TIMES

Total and Dissolved Metals, Mercury, Ammonia, Nitrate plus Nitrite, Total Dissolved Phosphorus, COD, Oil & Grease, Organic Carbon, Phenolics

1. Collect sample and tightly reseal the cap.
2. Agitate the sample by gently shaking the sample bottle to mix the acid and water.
3. Remove the cap and using a clean, 10 mL glass pipette extract approximately 1 mL of sample.
4. Place approximately two drops of sample on a 1 inch strip of 0-3 range pH paper.
5. Compare pH strip's color while wet with that of the color key included on the pH paper container.
6. If pH is not less than 2, add appropriate additional Sulfuric Acid to the sample using a clean pipette.
7. Recheck sample using steps 2 through 6 until sample pH is less than 2.

Cyanide

1. Collect sample and tightly reseal the cap.
2. Agitate the sample by gently shaking the sample bottle until the NaOH pellets are dissolved.
3. Remove the cap and using a clean 10 mL glass pipette extract approximately 1 mL of sample.
4. Place approximately two drops of sample on a 1-inch strip of 12-14 range pH paper.
5. Compare pH strip's color while wet with that of the color key included on the pH paper container.
6. If pH is not greater than 12, add additional NaOH to the sample using standard procedures.
7. Recheck sample using steps 2 through 6 until sample pH is greater than 12.

E. SPECIAL CONDITIONS:

Not Applicable

F. REFERENCES:

Alpha Analytical Aqueous and Soil/Solid Reference Guides.

G. APPENDICES/FORMS:

Table 1 Laboratory Analysis: Summarizing parameters, methods, preservations, container type, holding times and minimum sample volumes are included as an attachment to this SOP.

END OF SOP
Final Check by C. Burns 10/27/15

Table 1

Laboratory Analysis	EPA Method	Standard Method and/or SW846 Method	Preservation	Container	Holding Time	Minimum Volume
WATER						
Acid Soluble & Insoluble Sulfide	-----	9030B	Cool to 4 deg C No Headspace	P or G	7 Days	8 oz.
Acidity as CaCO3	305.1	2310B	Cool to 4 deg C	P or G	14 Days	100 mL
Alkalinity	-----	2320B	Cool to 4 deg C	P or G	14 Days	100 mL
Alkalinity as CaCO3	310.1	2320B	Cool to 4 deg C	P or G	14 Days	100 mL
Ammonia	350.2/.3	4500-NH3 B,E	Cool to 4 deg C, H2SO4 to pH<2	P or G	28 Days	400 mL
Aromatic Hydrocarbons	602	8021B	1:1 HCl to pH <2, Cool to 4 deg C 0.008% Na2S2O3 if residual chlorine present	G, Vial screw cap with center hole Teflon- faced silicone septum	14 Days	40 mL
Biochemical Oxygen Demand	405.1	5210B	Cool to 4 deg C	P or G	48 Hrs.	500 mL
Bromide	300	-----	None	P or G	28 Days	250 mL
Calcium	-----	3120B	HNO3 to pH<2	P or G	6 Months	100 mL
Calcium- Hardness	200.7	3111B	HNO3 to pH<2	P or G	6 Months	100 mL
Carbamates	531.1	-----	Cool to 4 deg C, 0.08% Na2S2O3 if residual chlorine present	G, screw cap Teflon faced silicone septum	14 Days	100 mL mL
Carbonaceous BOD	-----	5210B	Cool to 4 deg C	P or G	48 Hrs.	1000 mL
Chloride	300	4500-CL D 4110	Cool to 4 deg C	P or G	28 Days	100 mL
Chloride, Residual Disinfectant	-----	4500Cl-G	Cool to 4 deg C	P or G	Analyze Immediately	200 mL
COD	410.4	5220D	H2S04 to pH<2, Cool to 4 deg C	P	28 days	250 mL
Color	-----	2120B	Cool to 4 deg C	P or G	24 Hrs	100 mL
Conductivity	-----	2510B	Cool to 4 deg C	P or G	28 Days	100 mL
Cyanide	335.4	4500-CN C&E	Cool to 4 deg C NaOH pH>12	P or G	14 Days	250 mL
Cyanide	335.2	9010B, 9012A, 9014	Cool to 4 deg C, NaOH to pH>12 0.6 g ascorbic acid if residual chlorine present	P or G	Sulfide absent, 14 days; sulfide present 24 Hrs	250 mL
Cyanide, Amenable	335.1					
Dioxin	-----	8280A	Cool to 4 deg C 0.008% Na2S2O3 if residual chlorine present	G, Amber Teflon-lined screw cap	7 days until extraction 40 days after extraction	1000 mL
DRO	-----	8015B	Cool to 4 deg C 0.008% Na2S2O3 if residual chlorine present	G, Amber Teflon-lined screw cap	7 days until extraction 40 days after extraction	1000 mL
Escherichia Coli	-----	9222B	0.008% Na2S203 if residual chlorine present 0.3 mL/125 mL 15% EDTA if > 0.01 mg/L heavy metals	Sterile P or G	30 Hrs. for Drinking Water 6 Hrs. for Waste Water	125 mL
Extractable Org. Compounds			Cool to 4 deg C, Store in dark	G, Amber Teflon-lined screw cap	*7 days	4000 mL

Table 1

Laboratory Analysis	EPA Method	Standard Method and/or SW846 Method	Preservation	Container	Holding Time	Minimum Volume
Fecal Coliform	-----	9222B or D	0.008% Na2S203 if residual chlorine present 0.3 mL/125 mL 15% EDTA if > 0.01 mg/L heavy metals	Sterile P or G	30 Hrs. for Drinking Water 6 Hrs. for Waste Water	125 mL
Fecal Streptococci	-----	9230C	Cool to 4 deg C 0.008% Na2S2O3 if residual chlorine present	Sterile P or G	30 Hrs. for Drinking Water 6 Hrs. for Waste Water	125 mL
Fluoride	300	4500 F-B,C S	Cool to 4 deg C	P or G	28 Days	300 mL
Foaming Agents (MBAS)	-----	5540C	Cool to 4 deg C	P or G	48 Hrs	250 mL
Gases	-----	3810	Cool to 4 deg C 0.008% Na2S2O3 if residual chlorine present 1:1 HCl to pH <2	G, Vial screw cap with center hole Teflon- faced silicone septum	7 days without HCl 14 days with HCl	40 mL
GRO	-----	8015B	1:1 HCl to pH <2, Cool to 4 deg C 0.008% Na2S2O3 if residual chlorine present	G, Vial screw cap with center hole Teflon- faced silicone septum	7 days w/o HCl 14 days w/HCl	40 mL
Hardness			HNO3 to pH<2	P	6 months	1000 mL
Heterotrophic Plate Count	-----	9215B	Cool to 4 deg C 0.008% Na2S2O3 if residual chlorine present	Sterile P or G	30 Hrs. for Drinking Water 6 Hrs. for Waste Water	125 mL
Hexavalent Chromium	7196A	3500Cr-D	Cool to 4 deg C	P	24 hours	500 mL
HPLC (Explosive)	------	8330	Cool to 4 deg C	G, Amber Teflon-lined screw cap	7 days until extraction 40 days after extraction	1000mL
HPLC (Explosive)	------	8310	Cool to 4 deg C	G, Amber Teflon-lined screw cap		1000mL
Mercury	-----	7470A	Cool to 4 deg C	P or G	28 Days	8 oz.
Metals	200.7	-----	HNO3 to pH<2	P	6 Months	100 mL
Nitrate	300	-----	Cool to 4 deg C	P or G	48 Hrs.	100 mL
Nitrate (Chlorinated)	353.2	4500-NO3 F	Cool to 4 deg C	P or G	48 Hrs	250 mL
Nitrate (Non- chlorinated)	353.2	4500-NO3 F	H2SO4 to pH<2, Cool to 4 deg C	P or G	14 Days	250 mL
Nitrite	300, 353.2, 354.1	4500-NO3 D	Cool to 4 deg C	P or G	48 Hrs	100 mL
Odor	-----	2150B	Cool to 4 deg C	G only	24 Hrs	200 mL
Oil and Grease		1664	HCl to pH<2, Cool to 4 deg C	G, Amber Teflon-lined screw cap	28 days	1000 mL
Organic Nitrogen	351.1	-----	Cool to 4 deg C, H2SO4 to pH<2	G	28 Days	500 mL

Table 1

Laboratory Analysis	EPA Method	Standard Method and/or SW846 Method	Preservation	Container	Holding Time	Minimum Volume
Organochlorine Pesticides/PCB	608	8081A,8082	Cool to 4 deg C 0.008% $Na_2S_2O_3$ if residual chlorine present If aldrin is to be determined bind to pH 5-9.	G, Amber Teflon-lined screw cap	7 days until extraction 40 days after extraction	1000 mL
Ortho Phosphate	300	4500 P-E	Cool to 4 deg C	P or G	48 Hrs	50 mL
Orthophosphate	365.2	-----	Filter immediately, Cool to 4 deg C	P or G	48 Hrs.	50 mL
pH, Hydrogen ion	-----	4500-H-B	Cool to 4 deg C	P or G	Analyze Immediately	25 mL
Phenols	420.1	9065, 510ABC	Cool to 4 deg C, H_2SO_4 to pH<2	G	28 Days	500 mL
Pseudomanas Aeruginosa	-----	9213E	Cool to 4 deg C 0.008% $Na_2S_2O_3$ if residual chlorine present	Sterile P or G	30 Hrs. for Drinking Water 6 Hrs. for Waste Water	125 mL
Purgeable Halocarbons	601	8021B	Cool to 4 deg C 0.008% $Na_2S_2O_3$ if residual chlorine present	G, Vial screw cap with center hole Teflon- faced silicone septum	14 Days	40 mL
Radiological	-----	-----	HNO_3 to pH<2	P or G	6 Months	100 mL
Residue- Settleable (SS)	160.5	-----	Cool to 4 deg C	P or G	48 Hrs.	1000 mL
Residue-filtered (TDS)	160.1	-----	Cool to 4 deg C	P or G	7 Days	100 mL
Residue-non- filtered (TSS)	160.2	-----	Cool to 4 deg C	P or G	7 Days	100 mL
Residue-Total Volatile Solids	160.4	2540 E	Cool to 4 deg C	P or G	7 Days	100 mL
Salinity	-----	2520 C	Cool to 4 deg C	G	28 Days	100 mL
Semivolatile Organic Compounds (Unregulated)	525.2	-----	If residual chlorine is present, add 40-50 mg Sodium Thiosulfate. If not chlorinated, add 6N HCl to pH<2 Cool to 4 deg C	G, Amber Teflon-lined screw cap	7 Days for extraction, 30 after extraction	1000 mL
Semivolatile Organics	625	8270C	Cool to 4 deg C 0.008% $Na_2S_2O_3$ if residual chlorine present	G, Amber Teflon-lined screw cap	7 days for extraction 40 days after extraction	1000 mL
Silica	200.7	-----	Cool to 4 deg C	P only	7 Days	50 mL
Specific Conductance	120.1	-----	Cool to 4 deg C	P or G	28 Days	100 mL
Sulfate	300	4500-SO_4	Cool to 4 deg C	P or G	28 Days	50 mL
Sulfate	375.4	-----	Cool to 4 deg C	P or G	28 Days	50 mL
Sulfide	376.2	9030 B, 4500S2-AD	Cool to 4 deg C, add zinc plus NaOH to pH>9	P or G	7 Days	50 mL
Sulfite (SO_3)	377.1	-----	None Required	G, Bottle and Top	Analyze immediately	50 mL
Surfactants (MBAS)	425.1	-----	Cool to 4 deg C	P or G	48 Hrs.	250 mL

Table 1

Laboratory Analysis	EPA Method	Standard Method and/or SW846 Method	Preservation	Container	Holding Time	Minimum Volume
TDS			Cool to 4 deg C	P	7 days	500 mL
Temperature	-----	2550B	None	P or G	Analyze Immediately	1000 mL
Temperature	170.1	-----	None Required	G, Bottle and Top	Analyze immediately	1000 mL
Total Kjeldahl Nitrogen	353.3/.1	4500Norg-C	H2S04 to pH<2 , Cool to 4 deg C	P	28 days	250 mL
Total Coliform	-----	9221D	0.008% Na2S203 if residual chlorine present 0.3 mL/125 mL 15% EDTA if > 0.01 mg/L heavy metals	Sterile P or G	30 Hrs. for Drinking Water 6 Hrs. for Waste Water	125 mL
Total Dissolved Solids	160.1	2540C	Cool to 4 deg C	P or G	7 Days	100 mL
Total Hardness	130.2 , 200.7	-----	HNO3 to pH<2 H2SO4 to pH<2	P or G	6 Months	100 mL
Total Kjeldahl Nitrogen	351.3	-----	H2SO4 to pH<2	P or G	28 Days	500 mL
Total Metals	200.7 200.8	6010B, 6020, 7000A	HNO3 to pH<2	P	6 months (Hg 28 days)	500 mL
Total Organic Carbon (TOC)	415.1	9060, 5310C	H2SO4 to pH<2, Cool to 4 deg C	G, Amber Teflon-lined screw cap	28 days	80 mL
Total Organic Halides		5320B	1N H2SO4 to pH<2	P or G	28 Days	50 mL
Total Phosphorus	365.2	-----	Cool to 4 deg C, H2SO4 to pH<2	G	28 Days	50 mL
Total Recoverable Oil & Grease	413.1,166 4A	-----	Cool to 4 deg C, HCL or H2SO4 to pH<2	G	Petroleum Based 3 Days; Non-Petroleum Based 24 hours	1000 mL
Total-Residue (TS)	160.3	2540B	Cool to 4 deg C	P or G	7 Days	100 mL
Turbidity	180.1	2130B	Cool to 4 deg C	P or G	48 Hrs	100 mL
Volatile Organics	624	8260B	1:1 HCl to pH <2, Cool to 4 deg C 0.008% Na2S2O3 if residual chlorine present	G, Vial screw cap with center hole Teflon-faced silicone septum	7 days w/o HCl 14 days w/HCl	40 mL
Volatiles (Regulated)	524.2	-----	Cool to 4 deg C HCl to pH<2	G, Vial screw cap with center hole Teflon-faced silicone septum	14 Days	60-120 mL
SOIL						
Acid Soluble & Insoluble Sulfide	-----	9030B	Cool to 4 deg C, no headspace	P or G	7 Days	8 oz.
Amenable Cyanide	-----	9213	Cool to 4 deg C	P or G	14 Days	4 oz.
Bromide	-----	9211	Cool to 4 deg C	P or G	28 Days	8 oz.
Cation - Exchange Capacity	-----	9080, 9081	None	P	-----	8 oz.
Chloride	-----	9212, 9056, 9253	None	P or G	28 Days	8 oz.
Chlorinated Herbicides	-----	8151A	Cool to 4 deg C	G, wide mouth, teflon liner	14 Days	8 oz.
Corrosivity pH Waste>20% water	-----	9040B	Cool to 4 deg C	P	Analyze Immediately	4 oz.

Table 1

Laboratory Analysis	EPA Method	Standard Method and/or SW846 Method	Preservation	Container	Holding Time	Minimum Volume
Corrosivity Toward Steel	-----	1110	Cool to 4 deg C	P	14 Days	4 oz.
Cyanide		9010B, 4500CN	Cool to 4 deg C	G, Amber	14 Days	4 oz
Dioxin	-----	8280A	Cool to 4 deg C	G	14 Days	8 oz.
DRO	-----	8015B	Cool to 4 deg C	G, Amber	14 Days	4 oz.
Extractable Organic Compounds			Cool to 4 deg C, Store in dark	G	14 days	8 oz
Extractable Sulfide	-----	9031	Cool to 4 deg C, fill top of sample with 2N Zinc Acetate until moistened	P or G	7 Days	8 oz.
Fluoride	-----	9214	None	P	28 Days	8 oz.
Gases	-----	3810	Cool to 4 deg C	G, Amber	14 Days	8 oz.
Grain Size			N/A	G	N/A	8 oz
GRO	-----	8015B	Cool to 4 deg C, check state regulations for proper preservative. NJ (methanol), PA (encore samplers) NY (cool to 4 deg C).	G, Amber VOA vial	14 Days	15 Grams
HPLC (PAH)	-------	8310	Cool to 4 deg C	G, Amber Teflon-lined screw cap	14 days until extraction 40 days after extraction	4 oz.
Ignitability	-----	1010	None	P or G	None	8 oz.
Ignitability of Solids		1030	None	P or G	None	8 oz.
Mercury	245.1	7471A	Cool to 4 deg C	G, Amber	28 Days	4 oz.
Metals	-----	6010B, 6020, 7000A	Cool to 4 deg C	G, Amber	6 Months	8 oz.
Moisture Content			Store in airtight jar 3-30 deg C	G	N/A	8 oz
Nitrate	-----	9210	Cool to 4 deg C	P or G	48 Hrs	8 oz.
Oil & Grease (Sludge, Sludge- Hem)	-----	9071B	Cool to 4 deg C	G	28 Days	8 oz.
Organochlorine	-----	8081A	Cool to 4 deg C	P or G	14 Days	8 oz.
Paint Filter Liquids Test	-----	9095A	Cool to 4 deg C	P or G	-----	8 oz.
PCBs	-----	8082	Cool to 4 deg C	G, Amber Teflon-lined screw cap	14 Days	4 oz.
pH	-----	9045C	Cool to 4 deg C	G, Amber	Analyze Immediately	4 oz.
pH, Soil and Waste	-----	9045A	Cool to 4 deg C	G	Analyze Immediately	8 oz.
Phenol	-----	9065, 9066, 9067	Cool to 4 deg C	G, Amber	28 Days	4 oz.
Radiological	-----	-----	Cool to 4 deg C	G	6 Months	8 oz.
Reactivity Cyanide	-----	SW-846 7.3.3.2	Cool to 4 deg C	P	14 Days	8 oz.
Reactivity Sulfide	-----	SW-846 7.3.4.2	Cool to 4 deg C	P	14 Days	8 oz.
Semivolatile Organics	-----	8270C	Cool to 4 deg C	G, Amber	14 Days	8 oz.

Table 1

Laboratory Analysis	EPA Method	Standard Method and/or SW846 Method	Preservation	Container	Holding Time	Minimum Volume
Sulfate	-----	9035, 9036, 9038	Cool to 4 deg C	P or G	28 Days	8 oz.
Sulfides	-----	9215	Cool to 4 deg C	P or G	7 Days	8 oz.
TCLP Metals	-----	1311, 6010B, 6020, 7000A, 7470A	Cool to 4 deg C	G, Amber	180 Days (Hg 28 days)	8 oz
TCLP Herbicides	-----	1311	Cool to 4 deg C	G, Amber	14 Days	8 oz.
TCLP Pesticides	-----	1311	Cool to 4 deg C	G, Amber	14 Days	8 oz.
TCLP Semivolatile Organics	-----	1311, 8270C, 8081A, 8151A	Cool to 4 deg C	G, Amber Teflon Lined	14 Days	8 oz.
TCLP Volatile Organics	-----	1311, 8260B	Cool to 4 deg C	G, Amber VOA Vial Teflon Lined	14 Days	8 oz.
Temperature	-----	2550	-----	P	Analyze Immediately	4 oz.
TOC		Lloyd Kahn Method	Cool to 4 deg C	G, Amber	14 days	4 oz.
Total Coliform	-----	9131	Cool to 4 deg C	Sterile, P or G	6 Hrs	4 oz.
Total Coliform	-----	9132	Cool to 4 deg C	Sterile, P or G	6 Hrs	4 oz.
Total Cyanide	-----	9013	Cool to 4 deg C	P or G	14 Days	8 oz.
Volatile Organic Compounds	-----	8260B	Cool to 4 deg C Check individual state regulations for proper preservative. NJ (methanol), PA (encore samplers), NY (cool to 4 deg C)	G, wide mouth, teflon liner	14 Days	4 oz.
Volatile Organic Compounds	-----	8021		G, wide mouth, teflon liner	14 Days	4 oz.
CLP Sampling and Holding Time Information						
Cyanide (aqueous)	ILM04.1		NaOH to pH>12, Cool to 4 deg C	P	12 Days VTSR	1000ml
Cyanide**	ILM04.1		Cool to 4 deg C	G		8 oz
Mercury (aqueous)	ILM04.1		HNO3 to pH<2, Cool to 4 deg C	P	26 Days VTSR	1000ml
Mercury (solid/soils)	ILM04.1		Cool to 4 deg C	G		8 oz
Metals (aqueous)	ILM04.1		HNO3 to pH<2, Cool to 4 deg C	P	180 Days VTSR	1000ml
Metals (solid/soils)	ILM04.1		Cool to 4 deg C	G		8 oz
PCBs (aqueous)	OLM04.2		Na2S203, Cool to 4 deg C	G	See Note 7	1000ml
PCBs (solid/soils)	OLM04.2		Cool to 4 deg C	G	See Note 6	8 oz
Pesticides (aqueous)	OLM04.2		Na2S203, Cool to 4 deg C	G	See Note 7	1000ml
Pesticides (solid/soils)	OLM04.2		Cool to 4 deg C	G	See Note 6	8 oz
Semivolatile Organic Compounds (aqueous)	OMLO4.2		Cool to 4 deg C	G	See Note 8	1000ml
Semivolatile Organic Compounds (solid/soils)	OLM04.2		Cool to 4 deg C	G	See Note 6	8 oz
Volatile Organic Compounds (aqueous)	OLM04.2		HCL pH < 2, Cool to 4 deg C	G	W/preservative: 10 days VTSR; W/O: 7 days VTSR	40ml
Volatile Organic Compounds (solid/soils)	OLM04.2		Cool to 4 deg C	G	10 Days VTSR	4 oz

Table 1

Laboratory Analysis	EPA Method	Standard Method and/or SW846 Method	Preservation	Container	Holding Time	Minimum Volume

Notes:

1. P - Plastic.
2. G - Glass.
3. Minimum volume is the minimum volume required by the laboratory to conduct the analysis. The laboratory will likely require additional sample volume.
4. * Extraction within seven (7) days of collection; analysis within 40 days of extraction.
5. **When chlorine is present ascorbic acid is used to remove the interference (0.6 g ascorbic acid).
6. VTSR - Validated time of sample receipt.
7. Ten (10) days from VTSR for extraction and 40 days following extraction.
8. Five (5) days from VTSR for extration 14 days after extraction.
9. Five (5) days from VTSR for extraction 40 days after extraction.
10. Holding times are from the time of sample collection unless otherwise noted.

QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

A. PURPOSE/SCOPE:

This standard operating procedure explains the purpose and correct usage of Quality Assurance/Quality Control (QA/QC) samples. QA/QC samples are intended to validate the results of sample analysis by providing the means to determine the influence of outside factors on the sample and analysis. There are several types of QA/QC samples in use to ensure the best practices are being followed by both the laboratory preforming the analysis and the sampling team in the field. This is a general procedure for the use of QA/QC samples. Also refer to any guidelines provided by the laboratory.

B. EQUIPMENT/MATERIALS:

QA/QC samples require the following materials:

- Sample containers:
  They should be the same containers in number and type of preservative as the containers for the samples for which QA/QC samples are being taken.
- Analyte-free water
- Any laboratory supplied QA/QC materials.

C. PROCEDURE:

The following are types of QA/QC samples.

1. Duplicate Sample

A duplicate sample is a sample that is collected concurrently with the routine samples. It consists of an additional set of sample containers to be analyzed for the same parameters as the routine samples. It is taken at a sample point of the samplers choosing and at the same time as the routine sample for that sample point is taken. It is labeled and included on the Chain of Custody (COC) Form (see SOP 105) with a name unknown to the laboratory.

Example:

- Sample Point ID is **MW-1**
- Duplicate Sample ID is **CHA-1**

The duplicate sample is submitted as a 'blind' sample to the laboratory. The purpose of a duplicate sample is to allow the sampler to determine the precision of laboratory analysis. The results of the duplicate sample are compared with the results of the concurrent routine sample by the sampler. These results should be within the margin of error for the test being performed.

One duplicate sample should be taken for every twenty (20) routine samples. For example if 16 samples points were sampled, there would be 1 duplicate sample taken at one of the sample points for a total of 17 sample sets submitted to the lab.

2. Field Blank

The Field Blank sample is a type of QA/QC sample used to account for possible external contamination of the routine samples, usually by exposure to the air from being on site. It consists of an additional set of sample containers to be analyzed for the same parameters as the routine samples. It is common to only conduct a Field Blank for volatile organic compound (VOC) parameters even when sampling

QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

to additional parameters. This is because VOCs are more likely to be present in the atmosphere at the site then a parameter like metals. However a Field Blank can be conducted for any parameter.

The containers are prepared prior to sampling by filling the containers with analyte-free water. The containers are then transported with the routine sample containers to the site. Once at the site the containers are placed in a location representative of the site conditions and their caps are removed. At the end of the sampling event the caps are then replaced. The sample is labeled and included on the COC as **Field Blank** or **FB**.

If any results are positive for the Field Blank it can be assumed that the routine samples have also been exposed to a similar amount of contaminant and that contaminant is probably present in the atmosphere at the site.

One Field Blank should be taken as required for each day of sampling at the site. They are only used for the collection of aqueous samples.

3. Equipment Blank

An Equipment Blank is a QA/QC sample designed to measure the effectiveness of the decontamination of field equipment. It consists of an additional set of sample containers being analyzed for the same parameters as the routine samples.

An Equipment Blank is collected by pouring analyte-free water directly over/on/into the decontaminated sampling equipment coming into contact with the samples being collected. The water is then collected in the sample containers. Once the containers are filled they are capped and sent to the lab with the other routine samples. The sample is labeled and included on the COC as **Equipment Blank** or **EQ Blank**.

A positive result for the analysis of the Equipment Blank could signal inadequate decontamination of the equipment which may result in cross-contaminated samples and thus suspect results.

One Equipment Blank should be taken for every twenty (20) routine samples collected. The Equipment Blank is not necessary when using dedicated sampling equipment or sampling equipment that is disposed of between each sample point.

4. Matrix Spike/Matrix Spike Duplicate Sample

The Matrix Spike/Matrix Spike Duplicate (MS/MSD) Sample is a quality control system used by the laboratory to check the accuracy of their instruments. It consists of a set of two (2) samples taken at a sample point concurrently with the routine sample for a total of three (3) sets of containers for that sample point. Therefore, the MS/MSD samples should be collected from sample points with sufficient sample volume (e.g., monitoring wells that have low recharge are not good candidates). They are labeled and included on the COC as 'Sample ID' MS and 'Sample ID MSD'.

Example:

- Sample Point ID is **MW-1**
- Matrix Spike would be **MW-1 MS**
- Matrix Spike Duplicate would be **MW-1 MSD**

QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

The MS/MSD samples are submitted to the laboratory with the routine samples. Once at the laboratory they will have a known amount of an analyte added, known as the spike. The sample will then be run as a routine sample. Once the results are received they are compared to the results of the routine sample (MW-1 results are compared to MW-1 MS results). There should be a difference in the amount of analyte detected between the samples that should be within the margin of error of the amount of analyte spike that was added to the MS sample. This process is repeated for the MSD sample. This process is an internal review of results for the laboratory to determine the accuracy of their instruments.

One MS/MSD set should be taken for every twenty (20) samples (including Duplicate Samples and Field or Equipment Blank Samples). For example if 12 samples are taken, there should also be a set of MS/MSD samples taken for a total of 14 sample sets submitted to the lab. If 20 samples will be taken, only one set of MS/MSD samples needs to be submitted (total number of samples being 22).

The following QA/QC samples are used for only specific analyses or functions.

5. Trip Blank

A Trip Blank is a form of QA/QC that is utilized to account for possible exposure to an external source of VOCs during storage and transport of the sample containers and samples to and from the laboratory. It consists of a VOC sample container prepared by the laboratory and filled with analyte-free water. Trip Blanks are only required when aqueous samples are being collected for VOC analysis, all other parameters do not need one.

The Trip Blank is placed in the cooler with the sample containers when they are sent form the lab to the client. The Trip Blanks will remain in the cooler with the sample containers at all times. When the samples are collected they are placed in the cooler and put on ice with the Trip Blanks for shipment to the lab. At no time should the Trip Blanks be opened or removed from the coolers containing VOC samples. The Trip Blank should be labeled and included on the COC as **Trip Blank** or **TB**.

Each cooler that contains samples for VOC analysis must have a Trip Blank. It is good practice to combine all VOC containers from a site into one cooler to minimize the number of Trip Blanks required. For example if there are five coolers of samples, place all the VOC containers into one cooler and the remaining containers in the other four coolers. Thus only the VOC cooler requires a Trip Blank, which saves on the cost of analysis.

A positive result on the Trip Blank for a VOC could indicate the samples had been exposed during transportation which can have an effect on the results of the routine samples.

Different laboratories have different practices concerning their Trip Blanks. For example some laboratories will include just one VOA vial as their trip blank while others will utilize multiple vials for theirs. The extra vials are often included only as a backup in the event one of the Trip Blank vials is broken during transport, and will not be analyzed unless necessary.

D. QA/QC REQUIREMENTS:

Not Applicable

QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

E. SPECIAL CONDITIONS:

Temperature Blanks are a type of QA/QC that fall outside of the umbrella of QA/QC Samples.

A Temperature Blank is a container provided by the lab and is used to obtain the temperature of the cooler upon receipt at the lab, usually with an infrared thermometer. It is generally a ~125 mL plastic bottle filled with tap water.

- The Temperature Blank should be left in the cooler during sampling. When the cooler is being prepared for shipment, place the Temperature Blank in the center of the cooler next to the sample containers. There is no need to open the container; it is filled with tap water and therefore harmless unless otherwise noted on the container.
- It should be noted that not all laboratories require a Temperature Blank. There is no cost associated with the Temperature Blanks in the coolers.

F. REFERENCES:

United States Environmental Protection Agency (July 2007), *Samplers Guide, Contract Laboratory Program Guidance for Field Samplers*, Section 3.4, retrieved April 6, 2009, from http://www.epa.gov/superfund/programs/clp/download/sampler/clp_sampler_guidance.pdf

United States Environmental Protection Agency (May 2002), *Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers*, Page 34, retrieved December 15, 2010, from http://www.epa.gov/tio/tsp/download/gw_sampling_guide.pdf

G. APPENDICES/FORMS:

Not Applicable

END OF SOP

Final Check by C. Burns 10/27/15

APPENDIX B

Health and Safety Plan

HEALTH AND SAFETY PLAN

Alliance Tool
12 Pixley Industrial Parkway
Town of Gates, New York

Site No.: C828101

CHA Project Number: 080117.000

Prepared for:

Alliance Tool Company
1000 University Avenue,
Rochester, New York 14607

Prepared by:

300 South State Street, Suite 600
Syracuse, New York 13202
Phone: (315) 471-3920

December 2022

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LIST OF APPENDICES

1.0 INTRODUCTION

The following Health and Safety Plan (HASP) has been created for the protection of CHA Consulting, Inc. (CHA) staff conducting sampling for a Soil Vapor Intrusion (SVI) investigation anticipated to begin in January 2023 at a property located at 10 Pixley Industrial Parkway, Town of Gates, New York (Building). At the direction of the New York State Department of Environmental Conservation, this SVI investigation will be conducted to evaluate the potential for off-site migration of groundwater and soil vapor contamination from the Former Alliance Metal Stamping & Fabrication Facility (Site) located at 12 Pixley Industrial Parkway, Town of Gates, New York (Figure 1). This project's various assignments require CHA employees to perform tasks where personal safety could be compromised due to chemical, physical, and/or biological hazards. While conducting field work, CHA employees may be exposed to chemical, physical, and/or biological hazards including but not limited to:

- Chemical exposure due to the presence of contaminated soil and/or demolition debris
- Slip/Trips/Falls
- Excessive noise for certain operations (e.g., power tools)
- COVID-19 virus potential exposure

This HASP presents guidelines to minimize the risk of injury to project personnel, provide appropriate and rapid response in the event of injury. It is the responsibility of CHA employees to follow the requirements of this HASP, or HASPs specific to individual facilities, and all applicable company safety procedures.

This HASP will be discussed with Site personnel and will be available on-Site for review while work is underway. CHA personnel will report to the Project Manager (PM) and consult with the Health and Safety Coordinator (HSC) in matters of health and safety. The Site Safety Officer (SSO) and Field Team Leader (FTL) is the same person for this project and is responsible for ensuring compliance with this HASP, stopping work when necessary, and for implementation of this HASP for daily Site activities.

Non-intrusive activities within CHA's Scope of work are those that do NOT have the potential to jeopardize the health and safety of Site workers, the public, or the environment with respect to Site contaminants. Intrusive activities within CHA's Scope of Work are those that have the potential to cause health and safety concerns to Site workers, the public, or the environment. These activities and any non-intrusive activities conducted in an Exclusion Zone require training per 29 CFR 1910.120 on a NYSDEC hazardous waste site.

2.0 KEY PERSONNEL

2.1 OFF-SITE PERSONNEL

Title: CHA Corporate Director of Health & Safety
Description: Responsible for the CHA's corporate health and safety program and developing procedures, policies, and coordinating training programs. Additionally, provides senior level guidance on development of HASPs and interpretation of regulations.
Contact:
Anthony Tremblay
(518) 302-9452 (Office)
(617) 908-7058 (Cell)

Title: Project Manager
Description: Guides project team in scientific and engineering aspects of the proposed work. Reports to upper-level management, provides sufficient authority and resources to satisfy health and safety requirements, and assumes total control over Site activities. The Project Manager is ultimately responsible for ensuring field implementation of this HASP. The Project Manager may visit the Site from time to time to check status of fieldwork.
Contact:
Keith Cowan, P.G.
(518) 453-2899 (Office)
(518) 466-8157 (Cell)

2.2 ON-SITE PERSONNEL

Title: Site Safety Officer/Field Team Leader
Description: Advises the field team on all aspects of health and safety issues, recommends stopping work if any operation threatens worker or public health and safety.

Responsible for coordinating project requirements in the field. The Field Team Leader oversees daily activities of the project and are, therefore, responsible for implementing health and safety requirements and following safety procedures in the field. The Field Team Leader will contact the local emergency response organizations to notify concerned affiliates of the hazards associated with this project.
Contact:
Karyn Ehmann
(315) 257-7250 (Office)
(585) 721-2402 (Cell)

2.3 AS-NEEDED PERSONNEL

Title: Fire Department
Description: Responds to fires and performs rescues.
Contact:
911
Gates Fire Department – (585) 426-2720

Title: Ambulance
Description: Responds to medical emergencies.
Contact:
911
Gates Volunteer Ambulance Service- (585) 247-5519

Title: Police
Description: Responds to emergencies and performs rescues.
Contact:
911
Gates Police Department – (585) 247-2262

Title: EPA National Response Center
Description: Responds to all oil, chemical, radiological, biological and etiological discharges into the environment, anywhere in the United States and its territories.
Contact:
(800) 424-8802

3.0 SITE ENTRY

3.1 OBJECTIVES

The objectives of the Site entry are to provide the following services, as needed/requested by Alliance Tool:

1. Conduct a building survey and chemical inventory.
2. Install sub-slab vapor points using a hammer drill.
3. Collect sub-slab vapor, indoor air, and ambient outdoor air samples from various locations.

3.2 SAFETY MEETINGS

To ensure that the HASP is being followed, the SSO shall conduct a safety meeting prior to entry to the Site or the initiation of any Site activity, if any conditions change, and before each workday. The attached Daily Jobsite Safety Brief Form should be utilized to document these daily jobsite briefings.

3.3 SAFETY TRAINING

The SSO will confirm that every person assigned to a task has had adequate training for that task and that the training is up to date by checking with the CHA Safety Coordinator and online database. CHA staff working on this project shall have a minimum of:

- 40-Hour Initial Hazardous Waste Operations and Emergency Response (HAZWOPER) training in accordance with 29 CFR 1910.120
- Current 8-hour HAZWOPER Refresher Training
- Field equipment safety training where applicable

All training will have been conducted and certified in accordance with OSHA regulations.

3.4 MEDICAL SURVEILLANCE

All CHA personnel will have had a medical surveillance physical consistent with OSHA regulations and performed by a qualified occupational health physician if deemed necessary by project requirements. The SSO shall confirm prior to initiation of work on this Site that every CHA person assigned to a task has had an annual physical, has passed the medical examination, and has

been determined medically fit by the occupational health physician for respirator use and this type of work if deemed necessary by the PM.

3.5 SITE MAPPING

Site mapping has been included in the Figures section of the HASP. Figure 1 illustrates the location of the subject Site. Directions and a map illustrating the route to the nearest hospital from the subject Site is provided in Appendix A of this HASP.

4.0 HAZARD EVALUATION

Hazards are generally divided into three (3) categories, exposure to chemicals and hazardous materials, safety/physical hazards, and biological hazards. Safety/physical hazards are generally hazards such as electrical shock, slips/trips/falls, and confined spaces. Chemical hazards are further segregated by their routes of exposure that may cause adverse health effects. Biological hazards typically include plants, animals, and insects.

4.1 CHEMICAL HAZARDS

Chemical and CAS #	OSHA PEL	NIOSH REL	IDLH	Ionization Potential (I.P)	Characteristics	Routes of Exposure	Symptoms of Exposure and Health Effects
Tetrachloroethene CAS#127-18-4	TWA 100 ppm, C 200 ppm, 5-minute max peak 300ppm in any 3 hour time period.	Ca	CA 150 ppm	9.32 eV	Colorless liquid, with a mild chloroform-like odor.	Inhalation, ski absorption, ingestion, skin and/or eye contact.	Irritation of the eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, Incoordination; head, drowsiness; skin erythema; liver damage.
Trichloroethylene CAS#79-01-6	TWA 100 ppm, C 200 ppm, 5-minute max peak 300 ppm in any 2 hours.	Ca	1000 ppm	N/A	Colorless liquid (unless dyed blue) with a chloroform-like odor.	Inhalation, ski absorption, ingestion, skin and/or eye contact.	Irritation of the eyes, skin; visual disturbance, lassitude, dizziness, tremor, drowsiness, nausea, vomit, dermatitis, cardis arrhythmias, paresthesia, liver injury.
1,2-Dichloro-ethylene CAS#540-59-0	TWA 200 ppm.	TWA 200 ppm.	1000 ppm	9.65 eV	Colorless liquid (usually a mixture of cis and trans isomers) with a slightly acrid, chloroform-like odor.	Inhalation, ingestion, skin and/or eye contact.	Irritation of the eyes, respiratory system; central nervous system depression.
Vinyl Chloride CAS#75-01-4	TWA 1 ppm C 5 ppm, 5 ppm(5 minute maximum peak in any 15 minute work period).	Ca	Ca	9.99 eV	Colorless gas or liquid below (below 7°F) with a pleasant odor at high concentrations.	inhalation, skin and/or eye contact.	Lassitude, abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frost bite.

Abbreviations:
Ca – Cancerous
C – Ceiling value
TWA – Time Weighted Average
IDLH – Immediately Dangerous to Life and Health
OSHA – Occupational Safety and Health Administration

PEL – Permissible Exposure Limit
NIOSH – National Institute for Occupational Safety and Health
REL – Recommended Exposure Limit
N/A – Not Available

4.1.1 Dispersion Pathways

The potential exposure mechanism that can transport particulates and VOCs from the areas of the intrusive Site activities to other areas of the Site as well as beyond the boundaries of the Site are:

- Release of contaminated vapors from beneath the concrete slab when drilling into the concrete floor.

Emissions can be a problem at any Site that involves intrusive activities and should be controlled to the extent feasible. To protect CHA personnel, a dust mask should be worn while drilling into the concrete floor to prevent inhalation of silica dust and possible vapors.

4.2 PHYSCIAL HAZARDS

Physical hazards such as the following may be encountered on-Site:

- Slips/Trips/Falls
- Lifting (generators, drums, equipment)
- Moving parts or power tools (drill)
- Noise (exceeding 85 decibels)

4.3 HAZARD IDENTIFICATION AND CONTROL

Hazard controls generally consist of following specific safety procedures, training, engineering controls, air monitoring, and PPE selection. CHA employees are required to use the PPE appropriate to their work task and potential exposures as outlined in this HASP.

The levels of PPE assigned to each activity are based on available information on the estimation of exposure potential associated with each work task.

Affected Personnel	Task/Operation	Hazards	Hazard Control
All personnel	Drilling into concrete slab for sample points.	• Skin and/or eye contact with contaminated soil, decontamination solutions, Silica dust from concrete, and sample preservation agents (if needed). • The inhalation of volatile organic vapors, dusts, and other airborne particulates during Site activities.	• Wear the required personal protective equipment when conditions or activities indicate the need for it (Wear dust masks while drilling into concrete and ear protection). • Keep airborne dust levels to a minimum by wetting down surfaces. • Use GFCI outlets. • Beware of electrical hazards.
All personnel	All field activities	Slips, trips, & falls	• Wear appropriate work boots. • Avoid slippery surfaces. • Remind field personnel to exercise good housekeeping practices • Be observant of activities around.
All personnel	All field activities	Physical injuries, such as abrasions or cuts	• Use safe work practices • Don proper PPE • Have a first aid kit readily available at Site
All personnel	All field activities	Noise Exposure	• Wear hearing protection if you must shout to hear someone who is standing one foot or less away.
All personnel	All field activities	Use of power tools	• Read operating manual for the power tools being used. Wear appropriate PPE while using tools (drill)
All personnel	All field activities	Security	• Stay alert to all on-Site activities • Report suspicious activities to PM
All personnel	Transporting and lifting equipment	Lifting techniques	• Do not overload yourself. Get help or make two trips if necessary. • Promote the use of proper lifting technique to prevent back strains.

Affected Personnel	Task/Operation	Hazards	Hazard Control
All personnel	All field activities	COVID-19 exposure	• Avoid meeting in groups. Abide by social distancing practices and keep at least 6 feet from others or wear a facemask. • Plan work to minimize close working conditions as much as possible. • Cover cough/sneezes • Wash hands thoroughly and often. • Avoid putting hands near face and eyes.

5.0 COMMUNICATION AND HAZARD COMMUNICATION

Communication shall be accomplished by person-to-person verbal conference between the on-Site SSO and the construction manager. All other communication will be via direct phone call. Communication procedures will be reviewed at the Safety Meeting before entering the work zone.

In compliance with 29 CFR 1910.1200, any hazardous materials brought on Site by any personnel (CHA or its sub-contractors) shall be accompanied with the material's Safety Data Sheet (SDS). The SSO shall be responsible for maintaining the SDSs on Site, reviewing them for hazards that working personnel may be exposed to, and evaluating their use on Site with respect to compatibility with other materials including personal protective equipment, and their hazards. Should the SSO deem the material too hazardous for use on the subject Site, the party responsible for bringing the material on Site will be required to remove it from the Site.

6.0 CONFINED SPACE

During this project CHA personnel will not be permitted to enter any confined space. No confined space work is anticipated during this project.

If a confined space entry becomes necessary, this HASP will be revised to outline all confined space entry procedures, techniques, and equipment to be consistent with OSHA regulations in 29 CFR 1910.146. Additionally, all entrants and attendants will be trained in Confined Space Awareness training consistent with 29 CFR 1910.146.

7.0 PERSONAL PROTECTIVE EQUIPMENT

At this time, Level A, B and C PPE are not expected to be needed. If Site conditions change and contamination is present at levels above the action level, this HASP will be updated to reflect greater protection of personnel. The following is a list of required PPE at this time.

Task/Operation	Level of PPE	Equipment
General Site observation at a distance greater than 25 feet from intrusive activities. • No drums present • No free product visible • 2-Minute Breathing Zone PID Readings < 5 ppm with the 10.6 eV bulb • No strong odors present	D	• Long pants (no shorts) • Hard hat • Safety glasses • Reflective vests or yellow safety shirt • Work boots with safety toe • Hearing protection (if required) • Gloves (as appropriate) • Dusk mask (as appropriate)
Site Observation or drilling activities within the Exclusion Zone • No drums present • No free product visible • 2-Minute Breathing Zone PID Readings <5 ppm with the 10.6 eV bulb • Strong, pungent odors noted	D	• Long pants (no shorts) • Hard hat • Safety glasses • Reflective vests or yellow safety shirt • Work boots with safety toe • Hearing protection (if required) • Gloves (as appropriate) • Dusk mask (as appropriate)

8.0 DECONTAMINATION

Under the planned work conditions, detailed personal decontamination procedures should not be necessary. Work clothing may become contaminated in the event of an unexpected splash or spill or contact with a contaminated substance. Minor splashes on clothing and footwear can be rinsed with clean water. Heavily contaminated clothing should be removed if it cannot be rinsed with water. Personnel assigned to this project should be prepared with a change of clean clothing whenever on site.

Equipment decontamination is not anticipated for this project because equipment will not be in direct contact with contaminated soil or groundwater.

9.0 EMERGENCY PROCEDURES

911 service is available and confirmed at this location. Call 911 immediately for emergency response. Only if the 911 is unavailable or has a long lead time should someone be driven to the nearest medical facility.

On-site emergencies can range in intensity from minor to serious conditions. Various procedures for responding to site emergencies are listed in this section. The designated SSO is responsible for contacting the CHA Project Manager who will notify the client as appropriate in emergency situations (however, others must assume responsibility if the situation warrants). An injured person shall be accompanied by another worker at all times.

Should an on-site emergency occur at the project Site (related to the project or otherwise) the following procedures shall be followed:

- Call 911 for additional emergency response.
- If the emergency occurs and is project specific, notify your assigned HSC after emergency care is provided to activate the appropriate actions.
- Properly trained personnel will determine if the emergency can be contained or remediated and initiate the appropriate action(s). Personnel shall not respond beyond their level of training.
- Employees are not to risk their health or life in taking aggressive action(s) to fight fire or stop releases. Only defensive actions shall occur until an action plan is resolved.
- Choose an exit route that provides fast, and safe, egress from the work area. The route taken should always be away from obvious obstructions or other hazardous conditions. Consult an evacuation map if you are unsure of where the nearest exit route is located.
- Do not delay evacuation to retrieve personal items or equipment.
- Persons shall exit areas in groups and attempt to stay together during evacuation procedures if and when possible.
- While evacuating, notice any conditions which should be reported to emergency personnel. Be alert for the location of smoke, fire and/or vapors. Report any of these conditions to emergency personnel.
- Be aware of emergency response vehicles and avoid interference with these.

Remain calm, keep voices low and wait for instructions from the Incident Commander. Do not leave the scene prior to notifying your assigned Project Manager and Field Team Leader. An incident report form is included in Appendix B.

10.0 EMERGENCY MEDICAL CARE

911 service is available and confirmed at this location. Only if 911 is unavailable or has a long lead time should someone be driven to the nearest medical facility.

Nearest hospital: Strong Memorial Hospital Emergency Room
(directions and map are provided in Appendix A of this HASP)

Address: 601 Elmwood Ave
Rochester, New York. 14642

Emergency Room Telephone Number: (585) 275-4551

Directions from Site:

Start: 12 Pixley Industrial Parkway, Gates, New York, 14642

1. Leave site parking lot and turn LEFT.
2. Turn RIGHT onto PIXLEY RD.
3. Turn LEFT onto HINCHEY RD.
4. Turn LEFT onto CHILI AVE.
5. Turn LEFT to merge onto I-390 S.
6. Take EXIT 17 towards NY-383 N/SCOTTSVILE RD.
7. Take a LEFT onto SCOTTSVILLE RD.
8. Take a RIGHT onto ELMWOOD AVE.
9. 601 ELMWOOD AVE is on the RIGHT.

End: 601 Elmwood Ave, Rochester, NY 14626

10.1 EMERGENCY NOTIFICATION NUMBERS

CHA Contact: Keith Cowan (518) 466-8157 (Cell)
Alliance Tool Company Contact: Gina Vollmer, (585) 233-0577 (Cell)
Fire Dept.: 911
Police Dept.: 911
Department of Emergency Services: 911
Poison Control: (800) 222-1222

10.2 ON-SITE FIRST AID

First aid kits will be available in the SSO's vehicle. General first aid procedures include:

Skin/Eye Contact: Flush eyes and/or skin thoroughly with water for 15 minutes. Remove contaminated clothing. If skin was contacted with a dry material, brush it off first, then flush with water. Seek medical attention if irritation develops.

Ingestion: Do not induce vomiting. Call Poison Control Center. Tell them what was swallowed, if possible. Follow instructions. Have SDS available for reference.

Inhalation: Remove person from contaminated environment without risking your own safety. **DO NOT ENTER A CONFINED SPACE. DO NOT ENTER EXCLUSION ZONE UNLESS WEARING ONE LEVEL HIGHER PROTECTION THAN VICTIM WAS WEARING.**
Administer CPR, if necessary.

Injuries: Do not move a victim who may have a back injury. Cover them with coats, blankets, or other appropriate items to keep them warm.

Apply pressure to bleeding wounds. If the victim is able, have the victim apply pressure to the wound. If they are not able, wear gloves to protect from exposure to blood. Put gauze bandages or other clean cloth over the wound. Do not remove blood-soaked bandages or cloth - instead put additional bandages or cloths over the blood-soaked bandages. Elevate the limb with the injury above the heart.

Administer CPR if victim does not have a pulse and if you are currently certified in CPR. Have someone call for an ambulance immediately if there is any possibility that the victim is having or had a heart attack.

Shock is likely to develop in any serious injury or illness. The following are signals of shock: restlessness or irritability; altered consciousness; pale, cool, moist skin; rapid breathing; and/or rapid pulse. In the event of shock, do the following: Immediately have someone call for an ambulance; have the victim lie down; elevate legs 12 inches unless you suspect head, neck, or back injuries; if victim is cool, cover the victim to prevent chilling; do not give the victim anything to drink, even if thirsty.

11.0 CERTIFICATION

All Site personnel covered by this plan have read the HASP and are familiar with its contents and provisions.

Name	Title	Date

12.0 STANDARD OPERATING PROCEDURES

OSHA Quick Cards and applicable standard operating procedures are available in Appendix C of this HASP.

13.0 JOB HAZARD ANALYSIS

- ☐ Airport Safety
- ☐ Asbestos Abatement
- ☐ ATV-4 Wheeler
- ☐ Bridge Inspection
- ✓ **Cold Stress/Winter Weather**
- ☐ Confined Space
- ☐ Dogs
- ✓ **Environmental Sampling/Outdoor Hazards**
- ✓ **Electrical Safety**
- ☐ Excavation
- ☐ Explosive atmosphere
- ☐ Exposure to Electrical Transmission Lines
- ☐ Heavy Equipment
- ☐ Heat Stress
- ✓ **Hand-Power Tools**
- ✓ **Noise**
- ☐ Pressurized Cans
- ☐ Rail Safety
- ✓ **Slips, Trips, Falls**
- ✓ **Working In-Around Traffic**
- ☐ Working Over Water
- ☐ Working With Ladders
- ☐ Biological Hazards

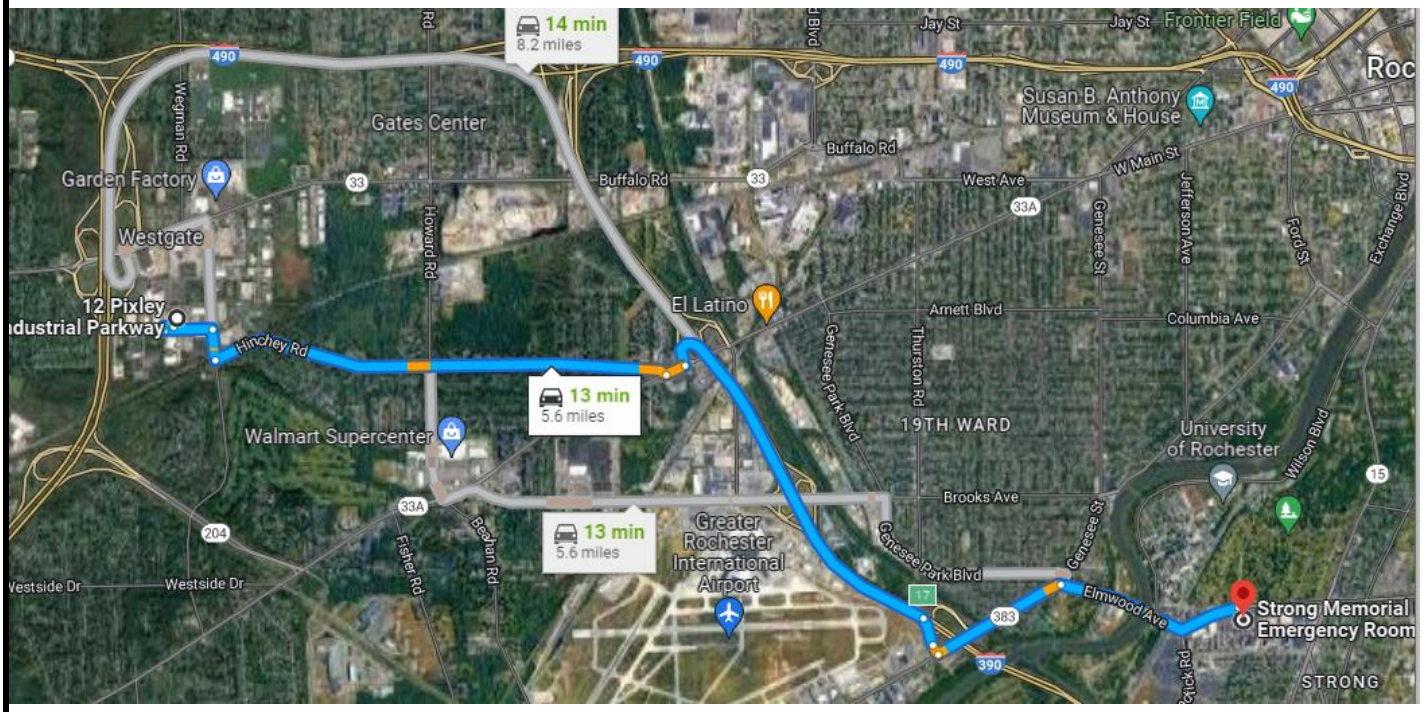
APPENDIX A
Hospital Directions and Map

SOURCE: Google Maps

Start: 12 Pixley Industrial Parkway, Gates, New York, 14642

Leave site parking lot and turn LEFT.
Turn RIGHT onto PIXLEY RD.
Turn LEFT onto HINCHEY RD.
Turn LEFT onto CHILI AVE.
Turn LEFT to merge onto I-390 S.
Take EXIT 17 towards NY-383 N/SCOTTSVILE RD.
Take a LEFT onto SCOTTSVILLE RD.
Take a RIGHT onto ELMWOOD AVE.
601 ELMWOOD AVE is on the RIGHT.

End: 601 Elmwood Ave, Rochester, NY 14626



300 South State Street Suite 600, Syracuse, NY 13202
www.chacompanies.com

FIGURE 1
DIRECTIONS TO NEAREST HOSPITAL
10-12 Pixley Industrial Parkway
Town of Gates
Monroe County, New York

NOT TO SCALE	DATE: December 2022

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APPENDIX B
Incident Report

Incident Report

Please Note: this form must be completed within (24) hours of an employee's injury or illness during the workday. This form can be completed by the employee or supervisor (or a witness if his/her supervisor is unavailable).

EMPLOYEE

Date of Incident	Employee's Name (First, MI, Last)	Full Address Where Incident Occurred	County

Time of Incident	Employee's Group	Employee's Occupation / Title

Please describe, in detail, what happened to cause the incident (conditions working under, how accident happened, etc.)

List the Nature of the Employee's Injury and Body Parts Affected (Indicate whether a similar work-related injury has occurred in the past):

What Was Employee Doing When Incident Occurred? (Be specific. If any tools/equipment involved, list them.)

How Did The Incident or Exposure Occur? (Describe fully the events, which resulted in the injury/illness.)

Object or Substance That Directly Injured Employee or Caused Illness? (Describe what caused injury/illness.)

Signature: Date:

SUPERVISOR

Hours at Work Before Incident?	Date Stopped Work Because Of This Injury/Illness	Was Employee Paid In Full For Day?	Name & Address of Doctor

Did You Provide Medical Care? (If Yes, When?)	Has Employee Returned to Work? (If Yes, When?)	Date You First Knew of Injury/Illness	Name & Address of Hospital	Type of Treatment Provided (Be specific with procedures performed, medication provided etc.)

Apparent Causes (List causes that appear to have directly contributed to the incident - unsafe acts and conditions.)

Immediate Actions Taken (List actions that will successfully prevent recurrence.)

Print Name (First, MI, Last) _____
Signature: Date:

HR

Loss Time	Restricted Duty	Severity of Injury/Illness (Circle One)		
❑Yes ❑No	❑Yes ❑No	Severe	Moderate	Minor

Date Injury/Illness Became Loss Time/Restricted Duty	Was Incident on Employer's Premises?	Is Case Recordable? *(H&S)* (If Yes, OSHA Case/File No.)	Date You First Knew Of Injury/Illness

Comments:

Print Name (First, MI, Last) _____
Signature: Date:

RETURN COMPLETED FORM WITHIN 24 HOURS OF THE INCIDENT TO RILEY SIMONE IN HUMAN RESOURCES

PHONE NUMBER - (518) 453-4518

E-MAIL ADDRESS – RSIMONE@CHACOMPANIES.COM

A follow up form will be completed by Health & Safety

cc: M. Platt
R. Rogers

APPENDIX C
Job Hazard Analyses

CHA Consulting, Inc.

Job Hazard Analysis

Hand/Power Tools

Task	Hazard Type and Description	Hazard Control
Using a band saw	Inhalation of hazardous fumes, gases, and dusts	Make sure there's appropriate ventilation and use disposable respirators
	Eye injury from projectiles	Wear safety glasses with side shields or appropriate safety goggles
	Trauma from projectiles, rotating parts, point of operation, ingoing nip points, flying chips and sparks	Exercise situational awareness in addition to using PPE, protective clothing, and machine guards
	Foot injury from dropping an object on one's foot	Wear safety shoes
	Hand injury from a sharp object	Wear gloves as appropriate for a task
	A fire from sparks	Have an appropriately placed fire extinguisher and remove all combustibles as well as fire hazards from the area
	Electrical shock from improper grounding and improper operations and maintenance	Make sure the frame is grounded properly and the manufacturer's instructions are strictly followed

Using general power tools	Injury to self or fellow worker on the job site	Employees must be given proper training/instruction before using certain power tools. No employee will operate a power tool unless they have been trained on how to use it. Guards shall be placed on power tools at all times. If tools are deemed unsafe or are not incompliance with manufacturers' guidelines or regulations, they will be locked, tagged, or discarded to prevent future use and operability. All of the manufacturer's procedures are to be followed
Using a gasoline powered chain saw	Inhalation from dust particles generated during machine operation and dust fumes	Use appropriate natural ventilation and/or disposable respirators
	Eye injury from projectiles	Wear safety glasses with side shield or appropriate safety goggles
	Head injury from projectiles	Face shields situational awareness, PPE, hardhat, protective clothing (chaps, long pants, long sleeve shirt), machine guards
	Trauma from projectiles, point of operation, flying chips & sparks, falling objects, improper use and operation	Follow instructions provided by the manufacturer
	Noise from the engine	Ear plugs/ear muffs
	Foot Injury from dropping an object on one's foot, impact of the saw blade	Wear cut resistant safety shoes
	Hand injury from point of	Gloves, machine guards,

	operation, in-going nip points, rotating parts, flying chips and sparks	situational awareness
	Fire from sparks	Have an appropriately placed fire extinguisher, remove all combustibles and fire hazard
Using a cutoff saw	Inhalation of dust/particles generated during machine operation	Have appropriate natural ventilation disposable respirators, automatic vacuum machine
	Eye injury from projectiles	Wear safety glasses with side shield or appropriate safety goggles
	Trauma from projectiles, rotating parts, point of operation, ingoing nip joints, flying chips & sparks	Exercise situational awareness, use PPE, wear protective clothing, and use machine guards
	Foot injury from dropping an object	Wear safety shoes
	Hand injury from point of operation, ingoing nip points, rotating parts, and flying chips as well as sparks	Utilize machine guards and situational awareness
	Head protection from projectiles	Use a face shield
	Fire caused by heat or sparks	Have an appropriately placed fire extinguisher and remove all combustibles as well as fire hazards from the area
	Electrical shock from	Apply lockout/tagout procedures

	improper grounding, improper operations and maintenance	and use the proper grounding of frame. Be sure to strictly follow the manufacturer's instructions
Gasoline powered portable generator	Inhalation of exhaust	Make sure the area is appropriately ventilated
	Trauma from burns	Exercise situational awareness, use the proper PPE and protective clothing
	Foot injury from the generator rolling over foot and dropping an object on one's foot	Wear safety shoes
	Fire from heat, sparks, and slag	Have an appropriately placed fire extinguisher and remove all combustibles as well as fire hazards from the area
	Electrical shock from improper operations and maintenance, improper switching device	Strictly follow the manufacturer's instructions, and make sure to do proper switching for starting up/shutting down the machine
Axe/hatchet use	Being struck or cut by the axe/hatchet while conducting a tool inspection	Makes sure the handle is clean and free of cracks or splits and the head is securely fastened to handle. Check if the bit is sharp and free of burrs. Make sure the sheath is in place to protect the blade
	Preparing the site can cause slips, trips, and falls in addition to being cut and/or struck by the tool	Clear the work area of one arm length plus three axe/hatchet lengths radius lengths of obstacles that could deflect the blade such as bushes or overhanging branches. Also, clear the work area of bark, limbs, or other items that could affect footing. Use a machete or saw to do so. Wear the required PPE such as safety glasses/goggles. Maintain a safe distance from other workers and

		always swing away from your body and toward the cut. If the tree or log to be chopped is not large enough to resist movement during chopping, secure it to another log, rock, or by other means. Position feet firmly with weight distributed evenly.
	Getting cuts form tripping and falling over stored material at the work site	When not in use, protect the blade with a sheath and place it in plain view a safe distance from the work area
	Cutting yourself or a fellow employee	Protect the blade with a sheath. When carrying, grasp the handle directly behind the head and carry it with the blade pointing down and away from the body. If traveling on a slope, carry the axe/hatchet in your downhill hand. Never carry with the axe/hatchet lade on your shoulder. If transporting on a pack, place the blade down and facing back in case of a trip or fall
Using a shovel	Getting lacerations, punctures, and cuts. Being hit by flying debris. Obtaining a splinter from the tool	Keep the shovel pointed down and do not swing it over the head. Be aware of yourself and your surroundings. Wear steel toed safety shoes, long pants, a long t-shirt, and safety glasses. Do not throw spoils from the shovel into the air, or use shovel as a pry bar. Inspect tools before use for good condition. Remove all unsafe tools and tagout
Using digging tools such as hand picks	Hitting or cutting yourself or a fellow worker	Do not use a pick head that is sharply pointed or badly blunted. Make certain the head is “bound” tightly to a good handle before swinging. Allow ample space for swinging. Do not over swing on

		the backswing. Wear eye protection when digging in very hard material. As you swing, squat by flexing the knees so the pick handle will be horizontal when the point strikes the earth. Doing so will keep the point away from your feet
Using a digging bar	Injury to self or fellow employee	Work with feet widespread. Hold the bar close to the body and lift and drop it vertically. Keep the point sharp enough to do the job without having to lift the bar excessively high. Do not use a bar that is bent
Using general hand tools	Injury to self or fellow employee	Use the right type and size of tool for each driving operations. Check for defects before using the tool. Do not use any wood cutting or driving tools on metal. Avoid striking brittle or mushroomed metal with a hammer because bits of steel may chip off. Use safety glasses. Never use tools with splintered or loose handles or with mushroomed/cracked heads. Allow ample space for swinging. When squatting, use a short- handled tool. When swinging, have the handle horizontal when the face of the driving head contacts the object being driven. With long-handled sledges this requires flexing the knees to lower the body during the swing. Do not full swing to drive objects that are more than waist high. Do not hold an object for someone full-swinging. When driving masonry nails and spikes into pavement or very hard earth, be sure the nail or spike is well started before releasing in and driving with full swings of the hammer. Wear eye protection
Using a machete to clear	Incorrect use of machetes	Visually inspect the surrounding

site	causing personal injury	area to make sure other workers on the job site are not in the proposed "swing path." Machete users must be no closer than ten feet apart. Lean forward while chopping if possible. Always chop away from one's body. Swing with a full swing at an approximate 45 degree angle, but do not over swing or swing too hard. Be sure to clear the area of small vegetation such as vines before cutting larger vegetation. Do not use machetes for heavy cutting, and use long-handed lopping shears or brush hooks instead of machetes for cutting thorny bushes and briars. Always use eye protection and use other PPE when appropriate including a hard hat, safety glasses, proper work shoes, and work gloves
Sharpening a machete	Cutting a part of one's body	Sharpen only from six inches from the butt of the handle to within two inches of the point. Use gloves when doing so
Using a hammer to drive stakes or nails into the ground to denote control points	Splinters and injury from hammer	Keep hands clear of the blow area. Wear the proper PPE including safety glasses, proper work shoes, and work gloves
Working with general hand tools/power tools	Cuts, bruises, electrocution, slips, trips, falls	Inspect hand tools prior to use. Be sure to wear the appropriate PPE including gloves. Never remove safety guards from power tools. Before servicing any power tool, such as changing drill bits, saw blades, or grinding wheels, you must unplug the tool first. Pneumatic power tools shall be secured to the air hose either by an approved quick connect fitting or by Chicago fittings with safety clips. Never plug in a wheel grinder or wire brush without first making sure the power switch is in the "off" position. All tools and

		equipment shall be maintained in good condition. Damaged tools or equipment shall be removed from service and tagged “Defective.” Pipe or Stillson wrenches shall not be used as a substitute for other wrenches. Only appropriate tools shall be sued for the job. Files shall be equipped with handles and not used to punch or pry. A screwdriver shall not be used as a chisel. Wheelbarrows shall not be pushed with handles in an upright position. Portable electric tools shall not be lifted or lowered by means of the power cord. Ropes shall be used instead. Electrical cords shall not be exposed to damage from vehicles driving over them.

Decibel (Loudness) Comparison Chart

Here are some interesting numbers, collected from a variety of sources, that help one to understand the volume levels of various sources and how they can affect our hearing.

Environmental Noise	
Weakest sound heard	0dB
Whisper Quiet Library at 6'	30dB
Normal conversation at 3'	60-65dB
Telephone dial tone	80dB
City Traffic (inside car)	85dB
Train whistle at 500', Truck Traffic	90dB
Jackhammer at 50'	95dB
Subway train at 200'	95dB
Level at which sustained exposure may result in hearing loss	*90 - 95dB*
Hand Drill	98dB
Power mower at 3'	107dB
Snowmobile, Motorcycle	100dB
Power saw at 3'	110dB
Sandblasting, Loud Rock Concert	115dB
Pain begins	*125dB*
Pneumatic riveter at 4'	125dB
Even short term exposure can cause permanent damage - Loudest recommended exposure WITH hearing protection	*140dB*
Jet engine at 100'	140dB
12 Gauge Shotgun Blast	165dB
Death of hearing tissue	180dB
Loudest sound possible	194dB

OSHA Daily Permissible Noise Level Exposure	
Hours per day	Sound level
8	90dB
6	92dB
4	95dB
3	97dB
2	100dB
1.5	102dB
1	105dB
.5	110dB

.25 or less	115dB

NIOSH Daily Permissible Noise Level Exposure	
Hours per day	Sound level
8	85dBA
6	86dBA
4	88dBA
3	89dBA
2	90dBA
1.5	92dBA
1	94dBA
.5	97dBA
.25 or less	100dBA
0	112dBA

Perceptions of Increases in Decibel Level	
Imperceptible Change	1dB
Barely Perceptible Change	3dB
Clearly Noticeable Change	5dB
About Twice as Loud	10dB
About Four Times as Loud	20dB

Sound Levels of Music	
Normal piano practice	60 -70dB
Fortissimo Singer, 3'	70dB
Chamber music, small auditorium	75 - 85dB
Piano Fortissimo	84 - 103dB
Violin	82 - 92dB
Cello	85 -111dB
Oboe	95-112dB
Flute	92 -103dB
Piccolo	90 -106dB
Clarinet	85 - 114dB
French horn	90 - 106dB
Trombone	85 - 114dB
Tympani & bass drum	106dB
Walkman on 5/10	94dB
Symphonic music peak	120 - 137dB
Amplifier, rock, 4-6'	120dB
Rock music peak	150dB

NOTES:

- One-third of the total power of a 75-piece orchestra comes from the bass drum.
- High frequency sounds of 2-4,000 Hz are the most damaging. The uppermost octave of the piccolo is 2,048-4,096 Hz.
- Aging causes gradual hearing loss, mostly in the high frequencies.
- Speech reception is not seriously impaired until there is about 30 dB loss; by that time severe damage may have occurred.
- Hypertension and various psychological difficulties can be related to noise exposure.
- The incidence of hearing loss in classical musicians has been estimated at 4-43%, in rock musicians 13-30%.
- Recent NIOSH studies of sound levels from weapons fires have shown that they may range from a low of 144 dB SPL for small caliber weapons such as a 0.22 caliber rifle to as high as a 172 dB SPL for a 0.357 caliber revolver. *Double* ear protection is recommended for shooters, combining soft, insertable ear plugs and external ear muffs.

Statistics for the Decibel (Loudness) Comparison Chart were taken from a study by Marshall Chasin , M.Sc., Aud(C), FAAA, Centre for Human Performance & Health, Ontario, Canada. There were some conflicting readings and, in many cases, authors did not specify at what distance the readings were taken or what the musician was actually playing. In general, when there were several readings, the higher one was chosen.

Additional Resources

The National Institute for Occupational Safety and Health (NIOSH) -http://www.cdc.gov/niosh/topics/noise/

American Tinnitus Association – Information and help for those with tinnitus

Hear Tomorrow – The Hearing Conservation Workshop

H.E.A.R. – Hearing Education and Awareness for Rockers

American Tinnitus Association – for musicians and music lovers

Turn It to the Left – from the American Academy of Audiology

Listen to Your Buds – from the American Speech-Language-Hearing Association

Binge Listening: Is exposure to leisure noise causing hearing loss in young Australians? [pdf] – report from Australian Hearing, National Acoustic Laboratories

Hearing Aids and Music: Interview with Marshall Chasin, AuD – from the American Academy of Audiology

Safe Listening Resources – from the National Hearing Conservation Association

OSHA Noise and Hearing Conservation -

CHA Consulting, Inc.

Job Hazard Analysis

Environmental Sampling/Outdoor Hazards

Task	Hazard Type and Description	Hazard Control
Working in hot environments	Heat disorders including heat cramps, heat exhaustion, and heat stroke	Employers can control this hazard by providing heat stress training to exposed employees, providing access to shade, and allowing employees to gradually get used to hot environments. Employees working in hot environments are advised to take breaks in cool rest areas, rotate physically demanding tasks, save most demanding work for cooler times of day, and utilize the heat index chart to determine exposure risk. Be sure that every employee working in the hot environments is drinking one cup of water ever fifteen minutes. Recognize the signs such as above normal body temperature, headaches, nausea, cramping, fainting, increased heart rate, and pale as well as clammy skin
	Sunburn	The risk of sunburn is higher when working at high elevations, or when working around water (from reflection). In these conditions, you can be burned even in overcast conditions; therefore, wear protective clothing and use sunscreen
High wind events	Severe wind events can create	Employees should avoid areas

	"wind throws" where strong winds can blow down trees	during high wind occurrences that exhibit previous wind damage
Working at high altitudes	Altitude sickness	Recognize signs of acute mountain sickness including headaches, light-headedness, inability to catch one's breath, nausea, and vomiting. Practice prevention by acclimating slowly to high elevations and staying hydrated. If the following symptoms progress, immediately descend to lower elevations and seek medical attention: difficulty breathing, chest pain, confusion, decreased consciousness, and loss of balance
Electrical storms	Being struck by lightning	While working outside, watch the sky for thunderstorms and seek shelter before the weather deteriorates. Stop working in streams and lakes. Someone at the job site must be able to begin revival techniques (i.e. CPR) if someone is struck by lightning. Do not use telephones. If caught in electrical storms, seek shelter inside a vehicle or building. When in a building, keep away from doors, windows, plugged in appliances, and metal. When in a vehicle, avoid contact with metal objects inside. If outside with no shelter, obey the following procedures: do not congregate, do not use metal objects, avoid standing near isolated trees, seek lower elevations such as valleys or canyons, and avoid being on peaks as well as trees. If you feel your hairs standing on end and your skin tingling, this is a sign that lightening might be about to strike so crouch immediately (feet together, hands on knees). Wait a minimum of 20-30 minutes after the last lightning flash to return to the field or outside area.

Being outdoors in cold weather for extended periods of time	Hypothermia	Recognize the signs including shivering, numbness, drowsiness, muscle weakness, dizziness, nausea, unconsciousness, low/weak pulse, and large pupils. Exercise practice prevention such as staying dry, wearing the appropriate clothing (layers), listen to the weather forecast to plan accordingly, stay hydrated, cover head with warm clothing, and stay active. Be aware of the role that wind-chill can play in hypothermia; under certain conditions, hypothermia can occur without any rain or being wet.
	Frostbite	Dress for the weather- layers are best, and mittens are better than gloves (keeps your warm fingers together while warming each other). Wear two pairs of socks with the inner layer made of synthetic fiber, such as polypropylene, to wick water away from the skin and the outer layer made of wool for increased insulation. Shoes should be waterproof. Keep your head, face, nose, and ears covered at all times. Clothes should fit loosely to avoid a decrease in blood flow to the arms and legs. Always travel with a friend in case help is needed. Be especially wary of wet and windy conditions; the "feels like" temperature (wind chill) is actually much lower than the stated air temperature. The very old, those who are not in good physical condition, and people with diabetes and anyone with vessel disease should take extra precautions.
Working in areas with	Giardia	Treat, filter, or boil drinking water.

limited access to clean drinking water		Do not drink untreated water from streams, lakes or springs.
Working outdoors	Rattlesnakes	Be alert and do not put your feet or hands where you cannot see what is on the ground (for example if you are stepping over a log and you cannot see what's on the other side). If you encounter a rattle snake do not pick it up- give it a wide berth and walk around it. If bitten, seek immediate professional medical attention and remove jewelry. If bitten on an extremity lower than the heart, cover wound with a sterile band while seeking medical attention.
	Bears	If you encounter a bear, be alert but stay calm, and give it as much room as possible. Try to leave the area, but DO NOT RUN. Back away slowly. If the bear follows, stop and hold your ground: wave your arms to make yourself look big and talk in a normal voice. Work in teams of two to deter bear attacks. If the bear makes contact, surrender: fall to the ground and play dead (a bear will break off an attack once it feels the threat has been eliminated). If the bear continues to bite after you assume a defensive posture. Their attack is predatory and you should fight back vigorously
	Mountain Lions	Be alert, calm, and do not panic. If you see a mountain lion, do not run as it may stimulate its predatory nature. Instead, shout and wave arms to let it know that you are not prey: fight back

	Tick bites	Use DEET based repellants on exposed skin and/or permethrin on clothes. Check for ticks during and after field work. If you find a tick remove it with tweezers within 24 hours, preferably immediately: do not leave the head embedded or extract the tick with matches, petroleum jelly, or other coatings (e.g. motor oil)
	Roughskin Newts	Avoiding handling them as their skin contains a potent neurotoxin. If necessary for the protocol, handle only when wearing gloves. Do not "lick" for "killer buzz" as people have died from attempting to eat roughskin newts
	Bee stings	If you know or suspect you are allergic to bee stings, carry appropriate allergy kits prescribed by a doctor for treating anaphylactic shock. Carry and take diphenhydramine (Benadryl). Follow the label instructions for allergy control. Inform your supervisor if you suspect you are allergic. Watch for ground nests
Travel movement or work in area with poison oak or poison ivy	Allergic reaction to poison oak/poison ivy plants	Learn to recognize poison oak. Avoid contact by using ivy block and wearing long pants and long-sleeve shirts if traveling in dense areas. If skin contact is made, flush the area with cold water as soon as possible. Do not flush your skin with warm water or soap as it can open your pores and increase the reaction. To wash and rinse use

		Tecnu or similar product with cold water to remove oils
Encountering irrigation pipes, marijuana plantation, or grow operations	Unfriendly encounters with criminal elements	Do not wear uniforms and carry a radio backpack that is not visible. Do not confront strangers and act like a tourist if you must speak. Work in pairs or groups. If working in areas likely to contain operations, check in with park staff when leaving vehicle and returning to vehicle. Watch for black piping or other signs. If you find a definite grow operation, leave immediately, note the location, and report it to the authorities