PHASE IV REMEDIAL INVESTIGATION WORK PLAN

CNY CAR CRUSHERS

(SITE ID #738048)
Hastings, Oswego County, New York

Prepared for:

NEW YORK STATE | Department of Environmental Conservation

New York State Department of Environmental Conservation
Division of Environmental Remediation
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MAY 2025

CERTIFICATION

I, Thomas C. Drachenberg, certify that I am currently a NYS registered professional engineer and that this Car Crushers Phase IV Remedial Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Tom Drachenberg

Thomas C. Drachenberg
New York State Professional Engineer
License No. 086020

Date

Unauthorized alteration or addition to this engineering document is a violation of Section 7209. Provision 2 of the New York State Education Law.

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ACRONYMS

AHA	Activity Hazard Analysis
ASR	Automobile Shredder Residue
Bgs	below ground surface
CAMP	Community Air Monitoring Plan
DER	Division of Environmental Remediation
ELAP	Environmental Laboratory Accreditation Program
EM	electromagnetic induction
FAP	Field Activities Plan
GHGs	greenhouse gases
GPR	ground-penetrating radar
GPS	global positioning system
IDW	investigation-derived waste
MS/MSD	matrix spike/matrix spike duplicate
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
PCBs	polychlorinated biphenyls
PFAS	per- and polyfluoroalkyl substances
PID	photoionization detector
PPE	personal protective equipment
PSHEP	Project Safety, Health, and Environmental Plan
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
RF	radio frequency
SCOs	Soil Cleanup Objectives
Site	former CNY Car Crushers site
SSHEP	Subcontractor Safety, Health, and Environmental Plan
SVOCs	semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
VOCs	volatile organic compounds

SECTION 1 PROJECT OBJECTIVES AND BACKGROUND

The former CNY Car Crushers site (the Site) is in a rural area on Hogs Back Road in the town of Hastings, Oswego County, New York. The Site is partially open fields and partially wooded and is bound on the north by Hogs Back Road, to the west by US Route 11, Delta Road to the east, and Belva Boulevard to the south. Residential areas are located to the north and east of the waste disposal area. The Site location is shown on **Figure 1**. As shown on **Figure 2**, the area of concern is approximately 6.5 acres within the 23-acre site. The New York State Department of Environmental Conservation (NYSDEC) inactive hazardous waste Site number is 738048.

The Site is situated at a ground surface elevation of approximately 480 feet above mean sea level. Slope follows the general area topography toward wetlands to the north and northeast.

The property was formerly used by CNY Car Crushers, which was wholly owned by Roth Steel Corporation, to dispose of automobile shredder reside (ASR). InteGreyted Consultants collected soil and waste samples on October 17, 2002, which indicated polychlorinated biphenyls (PCB) levels up to 700 parts per million (ppm) and elevated concentrations of metals such as mercury, lead, and chromium.

Phases I, II, and III of the remedial investigation delineated the waste mass and the extent of contamination onsite. The location of the ASR waste mass is shown on Figure 2. In general, the extent of the ASR waste is defined by elevated topography on the south, southeast and southwest sides of the waste mass, and then further defined by the borings and test pits. Waste extends very close to the northern property line but has not been found to extend onto adjoining properties. During previous phases of the remedial investigation, concentrations of PCBs, acetone, metals, pesticides, and per- and polyfluoroalkyl substances (PFAS) were detected above unrestricted soil cleanup objectives (SCOs) in surface and subsurface soils. PCBs were not detected in any groundwater samples. The analytes detected above groundwater quality criteria were PFOA, PFOS, phenol, aluminum, iron, manganese, and sodium.

Soil data was also used to determine the appropriate placement of a site security fence around the ASR waste disposal area and associated impacted soils. The site security fence encloses all soil sample locations that exceed the SCOs, except in the northwest corner of the site where soil impacts exist right on the property line. It is currently believed that most of the residences near the Site are supplied with public water, however, there may be several residences still using private wells.

The primary contaminants of concern have been identified as PCBs, cadmium, lead, and mercury. The purpose of the remedial investigation is to determine the vertical and lateral extent, and volume of the ASR waste, to fully characterize the Site in support of the feasibility study. Based on the findings from previous investigation phases, additional investigation is required to determine the vertical and lateral extent of ASR impacts. Phase IV investigation activities will focus on further delineating the nature and extent of these impacts along the northern property line and adjacent residential properties.

Tasks are further defined in subsequent sections, and include:

- Survey layout of property corners and the site fence.
- Global Positioning System (GPS) survey of proposed sampling grid points.
- Installation of up to 55 soil borings.
- Installation of up to 15 contingency soil borings.
- Collection of soil samples.
- Evaluation of laboratory results.
- Preparation and submittal of a final remedial investigation report.
- Preparation and submittal of a final feasibility study report

SECTION 2 HEALTH AND SAFETY

A Project Safety, Health, and Environmental Plan (PSHEP; Parsons 2021) has been prepared for the investigation activities. All personnel and subcontractors working on the project are required to follow this plan for the work covered in this work plan. Copies of the PSHEP will be maintained in the support zone.

Prior to the start of work, the subcontractors shall submit a Subcontractor Safety, Health, and Environmental Plan (SSHEP) along with specific Activity Hazard Analyses (AHAs) for tasks to be performed under this work plan. Work cannot commence until SSHEP and AHAs are reviewed, and comments have been addressed. Copies of the SSHEP and AHAs will be maintained in the support zone.

In addition, various plans will be implemented during the remedial investigation to control the management of materials generated during Site remediation.

A generic Community Air Monitoring Plan (CAMP) prepared for this contract will be implemented for real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the upwind and downwind perimeter of each designated work area during invasive activities on-site. These readings will be provided on a weekly basis with all exceedances reported to NYSDEC and New York State Department of Health (NYSDOH) the same day (or next business day if after hours) along with the following:

- Cause of exceedance
- Corrective actions implemented
- Efficacy of corrective actions

Field personnel will follow the NYSDOH Generic CAMP as further detailed in **Appendix A,** Division of Environmental Remediation (DER) -10 Fugitive Dust and Particulate Monitoring (NYSDEC 2010), and recommended response levels and action(s) will be implemented in the event of an exceedance.

Boring locations will be adjusted in the field as needed to avoid proximity to on-site structures and unsafe site features.

SECTION 3 QUALITY CONTROL

3.1 Field Activities

Field activities will be conducted in accordance with the following documents, prepared by Parsons for the NYSDEC program:

- Project Safety, Health, and Environment Plan (**Appendix B** – PSHEP 2021)
- Generic Quality Assurance Project Plan (**Appendix C** – QAPP 2020)
- Field Activities Plan (**Appendix D** – FAP 2020)

Investigation/sample location may be modified with concurrence from NYSDEC. All samples will be analyzed at an Environmental Laboratory Accreditation Program (ELAP) - accredited laboratory.

SECTION 4 REMEDIAL INVESTIGATION

The approach to the Phase IV remedial investigation is detailed in the following sections. Each portion of the investigation work will follow NYSDEC guidelines outlined in DER-10 Technical Guidance document (NYSDEC 2010). Parsons' *Subsurface Soil Disturbance Protocol* (see **Appendix E**) will be followed during intrusive site activities. The tasks for the investigation are discussed in the following sections.

4.1 Field Preparation

4.1.1 Residential Property Access

Access agreements will be coordinated by NYSDEC PM prior to conducting any fieldwork on neighboring residential properties. Currently, access has not been granted for one proposed property. If access is not granted prior to the start of fieldwork, these locations will be sampled during a separate mobilization.

4.1.2 Geophysical Investigation

Prior to initiation of site activities, Dig Safely NY will be contacted to locate utility lines that enter and/or cross over areas where soil borings will be installed. Additionally, a geophysical surveyor will be used to identify and locate underground utilities or structures that may be unique to each property. The geophysical surveyor will apply the appropriate surface geophysical method(s), including but not limited to ground-penetrating radar (GPR), radio frequency (RF), and electromagnetic induction (EM). These techniques will be used to search for utilities and/or obstructions. Specific features may include subsurface utilities, subsurface anomalies, large voids, former subsurface structures, abandoned utilities, and former utility trenches. Paint and flagging shall be used for marking of lines, showing any underground site utilities or obstructions.

4.2 Site Survey

The Site will be surveyed to create a grid and identify the layout of soil borings. In addition, the residential property lines to the north of the Site where drilling is proposed will be surveyed and marked with semi-permanent markers. After drilling is complete, each of the new soil boring locations will be surveyed for location and elevation. The fence surrounding the CNY Car Crushers Site will be surveyed for location. Proposed soil boring locations are shown on **Figure 3 and Figure 4**. Proposed soil boring locations will be adjusted in the field as needed to avoid proximity to on-site structures and unsafe site features. In addition, a minimum 10-foot distance will be maintained from any buried utility line or structure.

4.3 Soil Investigation

4.3.1 Soil Boring Installation

A total of up to 55 soil borings are proposed to be drilled to a maximum of 5 feet below ground surface to further delineate PCB, PFAS, and acetone impacts. Proposed boring locations are shown on **Figures 3 and 4**. The borings in the vicinity of former locations AAA1 and AAA4 will be on a 10-foot grid consistent with TSCA PCB delineation requirements.

Of the 55 total proposed soil borings, 24 locations are located on a neighboring property that NYSDEC does not yet have access to. These locations are R, S, T, U, V, W, X, K, L, M, N, N, O, P, A, B, C, Q, D, E, F, G, H, B, and J. If access is not granted prior to the start of fieldwork, these locations will be sampled in a separate mobilization. Additionally, 10 borings are located within 3 ft of the neighboring property. Boring locations Y, Z, and AA are located within 3 ft of the neighboring property line but have no access restrictions to those points. These three borings will be installed in their proposed location with additional care taken not to have any equipment on the property line. The remaining seven locations are between a fence and the property line. If there is sufficient space for a drill rig to fit between the fence and the property line these borings will be completed. If there is insufficient space for drilling operation these locations will be completed during a separate mobilization following property access being granted.

Methods to complete this task will use either a conventional drilling rig with 4 ¼-inch inside-diameter hollow stem augers or with a direct push method collecting macrocores. Given the nature of the fill material, 3-inch spoons or macrocores will be needed to ensure adequate recovery to collect samples in 1-foot intervals. If a conventional drilling rig is used, Standard Penetration Tests will be performed continuously per American Society for Testing and Materials D1586. Soil samples retrieved from each boring will be visually classified for soil type, grain size, texture, moisture content, and visible evidence of staining or impacts. Each sample will also be screened for the presence of VOCs with a photoionization detector (PID).

Upon completion, each soil boring will be backfilled with clean sand topped with topsoil. Drill cuttings will be contained in drums and characterized to determine the necessary disposal option (hazardous/nonhazardous). Investigation derived waste (IDW) will be managed in accordance with the PSHEP and applicable TSCA requirements. The area around the soil boring will be restored to match conditions prior to intrusive activities. Track mats may be used to access boring locations and minimize ground disturbances.

Any non-dedicated sampling equipment will be decontaminated between soil boring locations by washing equipment using a phosphate-free cleaning solution (e.g., Alconox) along with a distilled water rinse.

Visibly impacted drill cuttings and decontamination rinsates will be containerized in 55-gallon steel drums and transported to a central waste staging area for further characterization and disposal (**Section 4.5 Waste Handling**).

4.3.2 Contingency Soil Boring Installation

A total of 15 contingency borings have been assumed with five samples per boring to fill horizontal/vertical data gaps once the analytical data is received. Samples will be collected at 1-foot intervals to a depth of 5 feet below ground surface (bgs). Locations will be based on the data received.

Drilling methods will be the same as those listed in Section 4.3.1. Soil samples will be collected from each boring location and submitted to a laboratory for chemical analysis. It is assumed that all soil samples will be analyzed for PCBs and PFAS.

4.3.3 Soil Analytical Sampling

Soil samples will be collected in one-foot intervals from each boring location and submitted to a laboratory for chemical analysis. As shown in **Table 1,** all soil samples will be analyzed for PCBs. Samples from 15 locations (AA, BB, C, DD, EE, FF, HH, JJ, KK, LL, MM, XX, YY, Z and ZZ) will be analyzed for PFAS. Additionally, samples from three locations (AAA, BBB, and CCC) will also be analyzed for acetone. These locations are intended to delineate areas that were not delineated for PFAS or Acetone in previous investigation activities.

For quality assurance/quality control (QA/QC) purposes, duplicate samples, equipment blanks, and matrix spike/matrix spike duplicate (MS/MSD) samples will be collected and analyzed at a rate of one for every 20 field samples.

Results from the analytical sampling will be compared to the unrestricted and residential Part 375 *Soil Cleanup Objectives* (NYSDEC 2006) for the Site and unrestricted and residential SCOs for the residential property. Additional details on the analytical program are included in the QAPP (**Appendix C**).

4.4 Decontamination

Sampling equipment will be decontaminated between pushes and soil boring locations by washing equipment using a phosphate-free cleaning solution (e.g., Alconox) along with a distilled water rinse. The rinse process will involve pre-rinsing the tooling in a 5-gallon bucket of clean potable water to remove any large pieces of soil, the tooling will then be scrubbed using a brush and phosphate-free cleaning (e.g., Alconox) solution in distilled water in a second 5- gallon bucket, and finally rinsed in a third 5- gallon bucket of distilled water All “down hole” drilling equipment will be decontaminated inside a decontamination pad, using a high-pressure steam wash. The temporary decontamination pad will be constructed in accordance with standard remedial investigation practices (e.g., poly lined work area). Decontamination fluids will be collected, sampled, and disposed accordingly of as IDW.

4.5 Waste Handling

IDW, including excess soils from sample locations and decontamination rinsates will be placed in Department of Transportation-approved 55-gallon 17-H type drums. Drums will be labeled “pending analysis”. The IDW will be classified as hazardous or non-hazardous based on characterization results and will be disposed of in accordance with applicable NYSDEC regulations. Waste management and disposal will be managed by NYSDEC. Appropriate equipment capable of handling and/or moving IDW stored to the designated waste storage area will be used, and IDW drums will be stored in an area lined with polyurethane sheeting for secondary containment. Other used materials (such as personal protective equipment (PPE), acetate Geoprobe liners, poly sheeting, etc.) will be disposed of as regular trash.

4.5.1 Waste Characterization Sampling

Composite soil samples will be collected to evaluate potential disposal options for IDW. The specific parameters to be analyzed will be determined in consultation with a disposal facility but are likely to include the following parameters (as shown on **Table 1**):

- Reactivity
- Corrosivity
- Ignitability
- TCLP VOCs (these samples will be collected as discrete samples rather than as composites)
- TCLP semi-volatile organic compounds (SVOCs)
- TCLP metals
- Total cyanide
- Reactive cyanide
- PCBs
- Pesticides/herbicides

4.5.2 IDW Staging and Disposal

An IDW storage area with secondary containment of IDW drums will be established on-Site at the start of field work. The IDW storage area will consist of 10 mil. minimum plastic sheeting with a wood plank perimeter to prevent potential rainwater runoff. IDW generated during waste characterization sampling will be placed in New York State Department of Transportation (NYSDOT) -approved 55-gallon 17-H type drums and stored at the IDW storage area until analytical results have been received. Runoff generated at the IDW Storage Area will be pumped into 55-gallon drums and treated as IDW as needed. IDW will be disposed of in accordance with DER-10 (NYSDEC 2010) as well as applicable local, State, and Federal regulations.

Intrusive work that could result in the generation of large quantities of material requiring offsite transportation is not expected to occur. If transportation of material offsite is necessary, all transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364 (NYSDEC 2006). Haulers will be appropriately licensed and trucks properly placarded. Materials transported by trucks exiting the Site will be secured with either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet materials capable of producing free liquid, truck liners will be used.

SECTION 5 GREEN REMEDIATION

Green remediation concepts and techniques in accordance with DER-31 Green Remediation (NYSDEC 2010) will be considered and implemented to the extent feasible during all stages of the remedial program, including the remedial investigation. The major green remediation concepts as detailed in DER-31 are:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term when choosing a site remedy.
- Reducing direct and indirect greenhouse gases (GHGs) and other emissions.
- Increasing energy efficiency and minimizing use of non-renewable energy.
- Conserving and efficiently managing resources and materials.
- Reducing waste, increasing recycling, and increasing reuse of materials which would otherwise be considered a waste.
- Fostering green and healthy communities and working landscapes which balance ecological, economic, and social goals.
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Constructing any future on-site buildings, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial design program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed using a NYSDEC-accepted environmental footprint analysis tool.

Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated. Goals for the project related to these green and sustainable remediation metrics, as well as for minimizing community impacts, and promoting environmental justice, will be incorporated into the remedial design program, as appropriate. The project design specifications will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial design program.

Additionally, the remedial design program will include a NYSDEC climate screening checklist, to evaluate the impact of climate change on the project Site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial design program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

SECTION 6 REPORT PREPARATION

Data obtained during the field investigations described in this work plan will be validated, evaluated, and summarized. A remedial investigation report will then be prepared following completion of the investigation and receipt of analytical data. This report will document activities specified in this work plan along with investigation activities completed during previous phases of work.

Chemical analytical results for the environmental sample matrices specified in this work plan will be compared with standards and guidance values, as listed below. The document will include Category B data validation, and an evaluation of data for reclassification/delisting, or continuation of next steps of the site characterization.

Sample Matrix	Standards/Guidance	Reference	Acronym
Soils	Part 375 Soil Cleanup Objectives	NYSDEC 2006	SCOs

Following completion of the remedial investigation report, a feasibility study will be prepared. Feasibility study documentation will be prepared in accordance with DER-10 with tabular summaries of engineering analyses. Four remedial alternatives will be assessed. Potential future land uses to be assessed will range from commercial to unrestricted use. The Feasibility Study Report will include cost estimates with a level of detail appropriate for a feasibility study (not construction contractor cost estimates). Recommendations for follow-up work prior to remediation, if any, will also be included.

SECTION 7 SCHEDULE

Following approval of this work plan by NYSDEC, the schedule shown below will be implemented. As described in **Section 4**, work will take multiple mobilizations. This schedule does not account for additional mobilizations for property access granted and contingency fieldwork. The work scope described herein is assumed to be completed during Summer of 2025.

Task/Effort	Start of Task from Notice to Proceed Following Acceptance of Proposal
Preliminary Activities	Week 1
Soil Borings	Week 2-4
Survey	Week 6
Submission of Draft RI Report to NYSDEC	Week 18
Final RI Report	Week 24
Submission of Draft FS Report	Week 36
Final FS Report	Week 40

SECTION 8 REFERENCES

ASTM International. 2018. ASTM D2487-11. *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)*. DOI: 10.1520/D2487–11. West Conshohocken, PA.

Burmister, D.M. 1970. “Suggested Methods of Test for Identification of Soils.” in *Special Procedures for Testing Soil and Rock for Engineering Purposes: Fifth Edition.* Editor(s): ASTM Committee D-18. STP38522S. January 1. pp. 311-323. DOI: 10.1520/STP38522S.

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Parsons. 2021. *Project Safety, Health, and Environmental Plan (PSHEP)*. Prepared by Parsons for the New York State Department of Environmental Conservation Environmental Cleanup Program. Revision date December 2021.

FIGURES

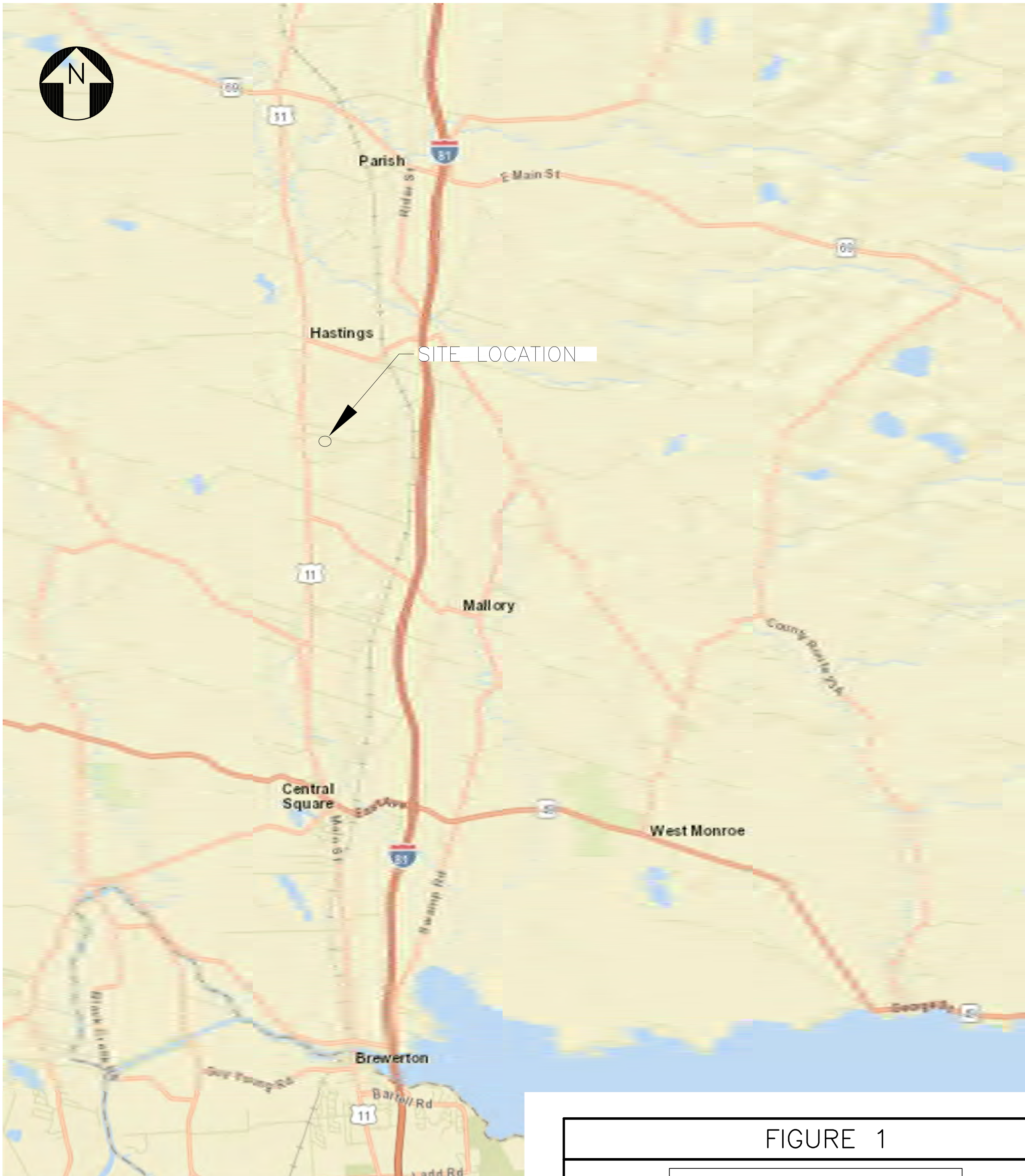

FIGURE 1

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CNY CAR CRUSHERS

SITE LOCATION MAP

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 * 315-451-9560

FILE NAME: P:\NYSDEC PROGRAM\450716 - WA #34 - CNY CAR CRUSHERS\10.0 TECHNICAL CATEGORIES\450716-SLM.DWG
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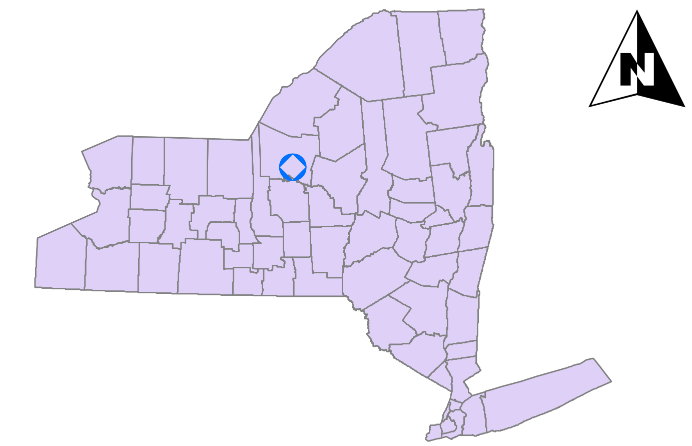

Elevation Contours (feet)

Approximate Fill Area

Tax Parcel Boundaries

0 75 150 300 Feet

Figure 2

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Estimated Fill Extent

CNY Car Crushers

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Plot Date: 2/21/2024

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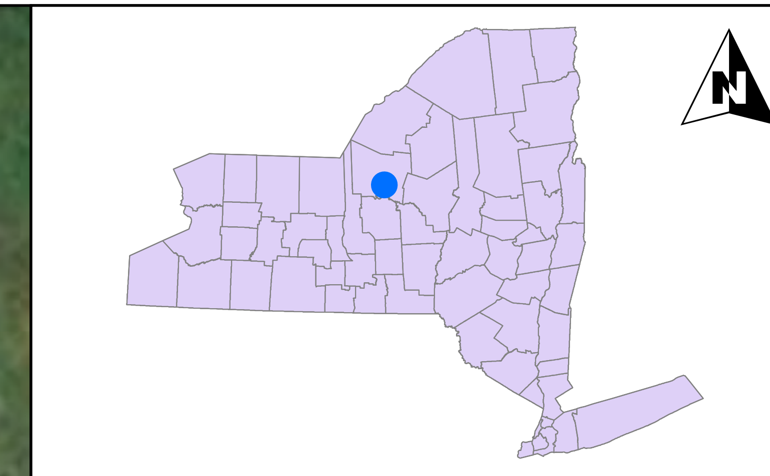

Legend:

- Proposed Additional Sample Locations
- Soil Sample Grid Point
- Soil Sample Location
- Soil Boring Location
- Test Pit Location
- No Exceedances
- Exceeds Unrestricted SCO For Pesticides
- Exceeds Unrestricted SCO For Acetone
- Exceeds Unrestricted SCO For PFOS
- Exceeds Unrestricted SCO For Metals
- Exceeds Restricted Residential SCO For Metals
- Exceeds Unrestricted SCO For PCBS
- Exceeds Restricted Residential SCO For PCBS
- Surveyed Property Boundary
- Site Fence (Approximate)
- Tax Parcel Boundaries
- Approximate Fill Area

Notes:

1) Awaiting access to property containing these boring locations, borings will be completed once access is obtained

0 25 50 100 Feet

Figure 3

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Northern Fence Line Western Area
Proposed Sampling Locations

CNY Car Crushers

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Plot Date: 4/29/2025 Plotted By: Sisson, Evan

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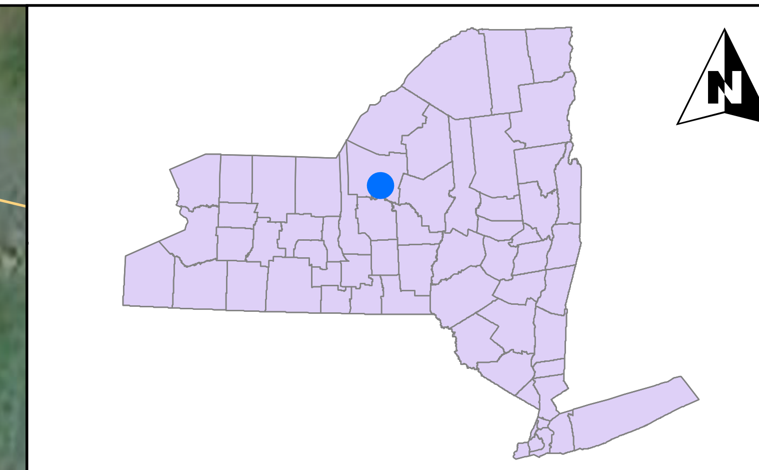

Legend:

- Proposed Additional Sample Locations
- Soil Sample Grid Point
- Soil Sample Location
- Soil Boring Location
- Test Pit Location
- No Exceedances
- Exceeds Unrestricted SCO For Pesticides
- Exceeds Unrestricted SCO For Acetone
- Exceeds Unrestricted SCO For PFOS
- Exceeds Unrestricted SCO For Metals
- Exceeds Restricted Residential SCO For Metals
- Exceeds Unrestricted SCO For PCBS
- Exceeds Restricted Residential SCO For PCBS
- Surveyed Property Boundary
- Site Fence (Approximate)
- Tax Parcel Boundaries
- Approximate Fill Area

0 25 50 100 Feet

Figure 4

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Northern Fence Line Eastern Area
Proposed Sampling Locations

CNY Car Crushers

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Plot Date: 4/23/2024

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TABLES

Table 1
Analytical Summary

Sample Type	Analysis	Method	Samples	QA/QC Samples: Duplicate	QA/QC Samples: Equipment Blank	QA/QC Samples: MS	QA/QC Samples: MSD	Total
Soil Analyses - Task 8 - Soil Borings								
Soil	Acetone	SW-846 8260	15	1	1	1	1	19
	PFAS	EPA 1633	70	4	4	4	4	86
	PCBs	SW-846 8082	155	8	8	8	8	187
Waste Characterization								
Soil	TCLP	SW1311	1	0	0	0	0	1
	TCLP Volatiles	SW8260C	1	0	0	0	0	1
	TCLP Semivolatiles	SW8270D	1	0	0	0	0	1
	TCLP Pesticides	SW8081B	1	0	0	0	0	1
	TCLP Herbicides	SW8151A	1	0	0	0	0	1
	TCLP Metals	SW6010C/SW7470A	1	0	0	0	0	1
	PCBs + Total	SW8082A	1	0	0	0	0	1
	Corrosivity	SW9045	1	0	0	0	0	1
	Ignitability	SW1030	1	0	0	0	0	1
	Reactivity (Cyanide and Sulfide)	SW7.3.3.2/SW7.3.4.2	1	0	0	0	0	1
Water	VOCs	SW8260C	1	0	0	0	0	1
	SVOCs	SW8270D	1	0	0	0	0	1
	Pesticides	SW8081B	1	0	0	0	0	1
	Herbicides	SW8151A	1	0	0	0	0	1
	Total Cyanide	SW9012B	1	0	0	0	0	1
	PCBs + Total	SW8082A	1	0	0	0	0	1
	Metals	SW6010D/SW7470A	1	0	0	0	0	1
	Corrosivity (pH)	SW9040	1	0	0	0	0	1
	Flashpoint	SW1010	1	0	0	0	0	1
	Reactivity (Cyanide and Sulfide)	SW7.3.3.2/SW7.3.4.2	1	0	0	0	0	1

Notes:

Assuming 31 boring locations are accessible

5 samples per boring (PCBs)

3 boring locations will have acetone samples (AAA, BBB, CCC)

14 boring locations will have PFAS

APPENDIX A NYSDOH GENERIC COMMUNITY AIR MONITORING PLAN

APPENDIX B

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

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

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

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

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

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

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

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

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

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

APPENDIX B PROJECT SAFETY, HEALTH, AND ENVIRONMENT PLAN

PROJECT SAFETY, HEALTH, AND ENVIRONMENTAL PLAN (PSHEP)

Prepared For:

New York State of Department of Environmental Conservation

625 Broadway, 12th floor

Albany, NY 12233-7012

Prepared By:

301 Plainfield Road, Suite 350
Syracuse, NY 13212

Revision Date
December 2021
(Also Revised for 2022 Use)

Contract Identification: Contract No D009811

Client: New York State Department of Environmental Conservation

Reviewer Name: Melissa Layfield, CSP
Reviewer Title: Program/Client HS Manager

Reviewer Signature: Melissa Layfield Date Reviewed: 12/3/2021

Approver Name: Tom Drachenberg, P.E.
Approver Title: Program/Project Manager

Approver Signature: Tom Drachenberg Date Approved: 12/06/2021

Approver Name: Ed Ashton, P.G.
Approver Title: Safety Officer

Approver Signature: Edward J. Ashton Date Approved: 12/06/2021

This Project Safety, Health, and Environmental Plan (PSHEP) addresses the work activities associated with Standby Contract No. D009811 between the State of New York Department of Environmental Conservation and Parsons Engineering of New York, Inc. for engineering services (February 2020). Related work elements of the contract and covered by this PSHEP are listed in Section 1.

This PSHEP addresses both the physical and chemical hazards that may be encountered during completion of the Scope of Work (SOW). This PSHEP is based upon the *Parsons Environmental, Safety, Health, and Risk Management (ESHARP) Procedure* and all applicable policies or procedures listed in the *Parsons Corporate Safety SharePoint Site on PWeb.*

This PSHEP addresses rules and regulations set forth in Title 29 of the Code of Federal Regulations part 1910 - Safety and Health Regulations for General Industry and part 1926 – Safety and Health Regulations for Construction. In addition, modifications to the PSHEP to comply with applicable federal, state, and local codes, rules, and regulations may be necessary.

This generic PSHEP will be used as a template for all PSHEPs written for Standby Contract D009811. The attachments include blanks, To-Be-Determined (TBD), or other placeholders to show appropriate detail. The Project Manager must update this generic PSHEP with work assignment specific details before it becomes the work assignment's PSHEP.

A PSHEP can be issued with some items remaining TBD, particularly elements that are not relevant until a future phase of work. The Project Manager must maintain and update the PSHEP as a living document (i.e. posted on ParShare) that reflects changes in personnel, hazards, or strategies. All affected staff will be notified of any updates and information will be covered in toolbox safety meetings or project orientations.

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LIST OF ACRONYMS

Acronym	Definition
ACGIH	American Conference of Governmental Industrial Hygienists
AHA	Activity Hazard Analysis
BBS	behavior-based safety
CREF	Contractor Risk Evaluation Form
CRZ	Contamination Reduction Zone
CSE	Contractor Safety Evaluation
ESHARP	Environmental, Safety, Health, and Risk Program
GBU	Global Business Unit
HAZWOPER	Hazardous Waste Site Operations and Emergency Response
HSSE	Health, Safety, Security and Environment
IDLH	immediately dangerous to life and health
MOC	Management of Change
NYSDEC	New York State Department of Environmental Conservation
OCIP	Owner's Controlled Insurance Program
PAH	polynuclear aromatic hydrocarbons
PEL	Permissible Exposure Limits
PFOS	perfluorooctanesulfonic acid
PPE	personal protective equipment
ppm	parts per million
PRP	Preventative Recovery Period
PSFA	perfluorooctanoic acid
PSHEP	Project Safety, Health, and Environmental Plan
RAC	Risk Assessment Code
SDS	Safety Data Sheet
SH&E	Safety, Health, and Environment
SOW	Scope of Work
SSHEP	subcontractor safety, health, and environment plan
SSO	Site Safety Officer
TBD	To-Be-Determined
TLV	Threshold Limit Value
TPH	total petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WBGT	Wet Bulb Globe Temperature

1.0 MANAGEMENT OF CHANGE (MOC)

Modifications may be made to this PSHEP document after review and approval by the Parsons Project Safety, Health and Environment (SH&E) Officer. Insert a description of the change in the table below (insert additional rows as necessary).

PSHEP Section	SH&E Approver	Date	Description/Comments
All	Melissa Layfield	December 2021	Updated NYSDEC PSHEP for New Standby Engineering Services Contract (Contract #D009811) to reflect Parsons current processes. Revisions also good for 2022.
All	Ed Ashton	April 2020	Created new NYSDEC PSHEP for New Standby Engineering Services Contract (Contract #D009811)

2.0 SCOPE OF WORK

Parsons in their contracted role with New York State Department of Environmental Conservation (NYSDEC) is providing Standby Engineering services for the work as specified in the Contract #D009811.

The specific scope of work elements for this contract and covered under this PSHEP is as follows.

- Site Characterization
- Phased Remedial Investigation/Feasibility Study
- Remedial Design
- Engineering Services During Remedial Action/Construction Management (Includes Orphan Oil Well Abandonments)
- Site Response Activities/Interim Remedial Measures
- Site Management
- Citizen Participation Activities
- Health and Safety Plan Development and Implementation
- Potential Responsible Party and Third-Party Oversight
- Soil Vapor Intrusion Investigations, System Monitoring and Maintenance

A DASH Card will be developed for each site for use as a quick reference safety card. Each DASH card is either kept in the project field binder or on the car dashboard and contains the following information:

- Site description
- Site contaminants of concern (if applicable)
- Required personal protective equipment (PPE)
- Site description and photo if available
- Emergency contact information
- Map and written directions to an urgent care facility and hospital
- General scope of work being performed

3.0 PARSONS SH&E POLICY STATEMENT

As an industry-leading, global technology solutions firm, Parsons is firmly committed to maintaining a safe, healthful, and environmentally sound workplace at all its offices, sites, and project facilities, guided by the following tenets.

- Safety, health, and environmental (SH&E) stewardship is our core value.
- Executive management leads our SH&E stewardship and strives to continually improve our management systems.
- Achieving SH&Eperformance excellence is a responsibility shared by all.
- SH&E performance is a key business performance indicator.
- Parsons' SH&E performance will be communicated openly.
- Leaders establish and reinforce expectations with employees and stakeholders, and leaders provide employees and stakeholders with the knowledge and skills necessary to perform their work to help ensure they achieve SH&E performance excellence.
- Employees and stakeholders are authorized and expected to stop work when conditions warrant it.
- Our SH&E efforts extend beyond our workplaces to include travel, our homes, and our communities.

To meet our SH&E performance objectives, all employees and stakeholders shall be actively engaged in SH&E issues. This requires the combined efforts of a concerned executive leadership team, responsible and knowledgeable managers and supervisors, and conscientious, well-trained employees and stakeholders.

At regular intervals, the executive leadership team shall monitor and improve the performance of our Environmental Safety, Health, and Risk Program (ESHARP) management system to ensure its continuing suitability, adequacy, and effectiveness in driving our SH&E performance excellence.

Parsons shall meet or exceed legal and other requirements for SH&E and shall strive to conform to the international standards to which we subscribe. Parsons' commitment to SH&E makes the world a better place.

3.1 ZERO INCIDENT GOAL

Parsons' goal is zero incidents. To achieve this, the project Team, led by the Project Manager, shall systematically, routinely, and continually identify the SH&E risks to project personnel, processes, equipment, the general public, and the environment, and develop effective and reliable control measures to minimize or eliminate these SH&E risks. As the project work changes, the SH&E risks change, and these risks shall be continually assessed, with control measures continually refined as work progresses.

3.2 STOP WORK AUTHORITY

Each Parsons employee and Parsons-contracted person is a critical leader for preventing injuries, illnesses, and adverse environmental impacts. Achieving SH&E excellence requires a personal commitment. Therefore, each employee is authorized to Stop Work immediately if a safety, health, or environmental concern exists or if the work is not going according to plan. Once work is stopped, each employee is expected to communicate the Stop Work to any other affected stakeholders (including notifying the Parsons Project Manager); further evaluate the conditions that led to the Stop Work; and evaluate hazard mitigations to the work plan that would resolve the safety, health, or environmental concern before restarting the work.

Each employee shall understand that he or she has the authority and the responsibility to Stop Work at any time when he or she notices an unplanned or unexpected issue that he or she believes will adversely affect the project's safety, health, or environmental risk. This concept is consistent with Parsons SH&E core values.

Sometimes, the idea of "Stop Work" suggests that the project is shut down and all employees end their workday. While this is a dramatic example of a possible stop work event, most stop work events are much simpler.

<u>Definition of S.T.O.P.</u>

1. Stop the task you are doing or intervene with a co-worker if appropriate.

2. Take immediate measures to notify any others affected. If there is no imminent danger, notify the appropriate line supervisors and site leaders. This is also a good time to make any other notifications, such as to the client.
3. Offer correction or get help if needed. Keep it positive. Affected parties shall discuss and gain agreement on the resolution of the stop work issue. The initiator of the stop work event shall be thanked for his or her concern.
4. Prepare to resume once the concern has been resolved, the hazards identified and mitigated, and the Stop Work has been discussed with the project manager. If necessary, suspend the task until the work plan can be reviewed and revised as necessary to properly evaluate the hazards. Positive feedback shall be provided to affected personnel regarding the resolution of the stop work issue.

There is no circumstance where retribution or retaliation will be tolerated toward any employee who conscientiously exercised his or her stop work authority.

3.3 PSHEP AUTHORITY

This PSHEP outlines requirements and guidelines developed by Parsons for project work. When implemented, these requirements will help protect project personnel, visitors, the public, and the environment from the effects of SH&E risks. Parsons employees should never perform a task that may endanger their own safety and health; the safety and health of coworkers or the public; or the environment. This PSHEP shall be updated as conditions or work phases change. All Parsons employees and contractors shall receive a copy of this PSHEP, understand it, and implement the provisions contained in it.

Parsons contractors shall establish their own SH&E programs for their work and employees. Contract specifications require each Parsons-contractor to accept provisions of the Parsons PSHEP and prepare its own contractor site-specific safety, health, and environmental plan (SSHEP) for work activities for which the contractor is responsible for performing (See Appendix A for Parsons Subcontractor Safety, Health, and Environmental Plan (SSHEP) template). The PSHEP requirements identified for project personnel (e.g., incident reporting, training, certifications of competence and qualification, substance abuse identification and testing) shall apply to contractor workers, and such provisions shall be included in each contractor's SSHEP.

This PSHEP and its associated legal compliance register, risk register, hazard and risk analyses, work plans, procedures, contractor SSHEPs, compliance programs, best practices, training matrix, and certifications of competence and qualification apply to all locations, facilities, operations, tasks, and project work. The Parsons Program Health and Safety Plan P-HASP and ESHARP Guidebook for projects will be followed.

Parsons Rules of Safety cover the following activities:

1. Daily Safety Planning (toolbox meeting)
2. Energy isolation
3. Ground disturbance
4. Confined space entry
5. Working at heights
6. Lifting Operations
7. Driving safety
8. Hot Work

The Rules of Safety are the minimum standards for safeguarding personal safety and the key controls and procedures that must be followed in all places of work. These rules have been prepared to allow the learning from past safety incidents to be shared widely across Parsons and emphasize the basic rules that should be in place in all locations for managing safety during typical risk activities. The Parsons Rules of Safety must be strictly enforced to ensure the safety of our people and the communities in which we live. They also provide a basis of safe practice for managing risks outside of work activities. Everyone should be aware of the Rules of Safety and follow them. Management are accountable for communicating, training, implementing and auditing them to assure compliance.

4.0 ORGANIZATIONAL STRUCTURE

A Team of appropriately trained and qualified professionals from Parsons will conduct work in this portfolio of projects. The following provides the responsibilities of the key personnel on this project.

<u>Program Manager</u> – The Program Manager is responsible for the management and control of the program and all services to the client including scope, safety, quality, resource, financial, and schedule performance. The Program Manager is the single point of contact for all official communications with the client, subcontractors, public and media, unless otherwise specified. The Program Manager will help to develop the PSHEP and will approve the initial version and any updates.

<u>Project Manager</u> - Responsible for all project activities including the quality of contract deliverables. The Project Manager will develop, approve, and implement the PSHEP and ensure that all personnel and subcontractor site personnel are trained in the site-specific project health and safety requirements. The Project Manager will also function as the primary client contact and ensure that all project and client requirements are met.

<u>Program Health and Safety Manager</u> - Provides technical advice and technical review for all aspects of the PSHEP and Program Safety and will ensure all technical requirements, stated in the contract, and in the PSHEP are met.

<u>Site Health and Safety Officer</u> - The Site Health and Safety Officer will ensure that the health and safety plan is properly implemented and that all personnel and subcontractor site personnel are trained in the site-specific project health and safety requirements. The Health and Safety Officer will have authority to stop work if unsafe conditions are observed.

Program Manager	Tom Drachenberg, P.E.
Project Managers	Matt Vetter, Sarah Weishaupt, George Moreau, Bill Long, Heather Budzich, Peter Scharfschwerdt, Eric Felter, Josh Hawley, and Ed Ashton
Program Health and Safety Manager	Melissa Layfield
Site Health and Safety Officer	Various – TBD
Task Leader(s)	Various – TBD

Key Project Stakeholders

Project Office

PARSONS
301 Plainfield Road
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Program/Project Manager – Tom Drachenberg, P.E.
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Program SH&E Manager: Melissa Layfield
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Global Business Unit (GBU) SH&E Director / Delegate: Marc Wetter
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Marc.Wetter@Parsons.com

5.0 LEGAL COMPLIANCE REGISTER

Parsons shall comply with regulatory, legal, and other similar requirements in the jurisdictions where the project work is completed. The legal compliance register identifies the SH&E-related laws, regulations, ordinances, and legal obligations that may impact the project. As legal requirements change during the lifecycle of the project, the changes shall be updated in the legal compliance register and their effects considered. See Appendix B for details.

Exhibit 5-1 represents regional, municipal, local, and/or OSHA regulations, owner, and Parsons corporate regulations and requirements applicable to the project. Based on the most recent risk assessments, the Parsons Project Manager and Program SH&E Manager will update the listed topics periodically. Training and other requirements are updated in this PSHEP as required by changes to Exhibit 5-1, Competent Person and Activity Hazards Analysis Requirements.

Parsons and its subcontractors are individually responsible for training their respective employees and for complying with all project requirements. Failure to comply could lead to disciplinary actions against Parsons employees and subcontractors or their employees. Further guidance is available in the Parsons Safety SharePoint Site on PWeb. Several key relevant Corporate Policies are provided in Appendix C.

Exhibit 5-1 – Competent Person and Activity Hazards Analysis / AHA Requirements

Safety and Health Requirement	OSHA /NYC Regulation	Competent/ Qualified Person	Training Required	Written Plan and AHA Required
General Safety and Health	1926.20	Yes	Yes	Yes
Safety Training Construction Safety	1926.21 Local Law 196	Yes	Yes	Yes
Confined Spaces	1926.21, 1910.147	Yes	Yes	Yes
Confined Space Permit System	See above	Yes	Yes	Yes
First Aid and Medical	1926.23, 50	Yes	Yes	Yes
Fire Protection and Prevention	1926.24, 150-155, 352	Yes	Yes	Yes
Housekeeping	1926.25	No	No	No
Illumination	1926.26, 56	Recommended	N/A	N/A
Sanitation	1926.27, 51	No	No	No
Personal Protective Equipment	1926.28, 95-98, 100-107	Yes	Yes	Yes
Acceptable Certifications	1926.29	N/A	N/A	Yes
Incorporation by Reference	1926.31	N/A	N/A	N/A
Emergency Employee Action Plans	1926.35	N/A	Yes	Yes
Radiation Protection	1926.53, 54	Yes	Yes	Yes
Gases, Vapors, Dusts and Mists	1926.55	Yes	Yes	Yes
Ventilation	1926.57, 353	Recommended	Yes	Yes
Hazard Communication	1926.59	Yes	Yes	Yes
Process Safety Management	1910.119; 1926.64	Yes	Yes	Yes
Hazardous Waste Operations and Emergency Response	1926.65 1910.120	Yes	Yes	Yes
Accident Prevention Signs and Tags	1926.200	N/A	N/A	N/A
Signaling	1926.201	Recommended	N/A	N/A
Barricades	1926.202	N/A	N/A	N/A
Material Storage	1926.250	N/A	Yes	Yes
Rigging	1926.251	Yes	Yes	Yes
Waste Disposal	1926.252	Yes	Yes	Yes
Tools	1926.300-307	N/A	Yes	Yes
Gas Welding and Cutting	1926.350	Recommended	Yes	Yes
Arc Welding	1926.351	Recommended	Yes	Yes
Electrical	1926.400-415	Yes	Yes	Yes
General Electrical	1926.416	N/A	Yes	Yes
Lockout Tagout	1926.417, 1910.147	Yes	Yes	Yes
Lockout Tagout Permit System	See above	Yes	Yes	Yes
Maintenance of Electrical Equipment	1926.431	Yes	Yes	Yes
Environmental Deterioration of Electrical Equipment	1926.432	Yes	Yes	Yes
Batteries/Battery Charging Equipment	1926.441	N/A	Yes	Yes
Scaffolding	1926.450-454	Yes	Yes	Yes

Exhibit 5-1 – Competent Person and Activity Hazards Analysis / AHA Requirements (Continued)

Safety and Health Requirement	OSHA /NYC Regulation	Competent/ Qualified Person	Training Required	Written Plan and AHA Required
Aerial Lifts	1926.453	Yes	Yes	Yes
Fall Protection	1926.500-503	Yes	Yes	Yes
Cranes, Derricks, Hoists, Elevators and Conveyors	1926.550	Yes	Yes	Yes
Motor Vehicles, Mechanized Equipment	1926.600-603	Yes	Yes	Yes
Powered Industrial Trucks (forklifts)	1910.178	Yes	Yes	Yes
Site Clearing	1926.604	N/A	Yes	Yes
Marine Operations and Equipment	1926.606	Yes	Yes	Yes
Excavations	1926.650-652	Yes	Yes	Yes
Excavation Permit	N/A	Yes	Yes	Yes
Concrete and Masonry Construction	1926.700-706	Yes	Yes	Yes
Steel Erection	1926.750-761 and SENRAC	Yes	Yes	Yes
Underground Construction	1926.800	Yes	Yes	Yes
Caissons	1926.801	Yes	Yes	Yes
Cofferdams	1926.802	Yes	Yes	Yes
Compressed Air	1926.803	Yes	Yes	Yes
Demolition	1926.850-860 inclusive	Yes	Yes	Yes
Power Transmission and Distribution	1926.950-960 inclusive	Yes	Yes	Yes
Rollover Protective Structures; Overhead Protection	1926.1000-1003 inclusive	N/A	N/A	Yes
Stairways and Ladders Scope	1926.1050	N/A	Yes	Yes
S/L General Requirements	1926.1051	Yes	Yes	Yes
Stairways	1926.1052	Recommended	Yes	N/A
Ladders	1926.1053	Yes	Yes	Yes
Ladder/Stair Training	1926.1060	Yes	Yes	Yes
Diving Scope	1926.1071-1072	Yes	Yes	Yes
Dive Team Quals	1926.1076	Yes	Yes	Yes
Dive Safe Practices Manual	1926.1080	Yes	Yes	Yes
Pre-dive Procedures	1926.1081	Yes	Yes	Yes
Procedures During Dive	1926.1082	Yes	Yes	Yes
Post Dive Procedures	1926.1083	Yes	Yes	Yes
SCUBA Diving	1926.1083	Yes	Yes	Yes
Surface-Supplied Air Diving	1926.1085	Yes	Yes	Yes
Mixed-gas Diving	1926.1086	Yes	Yes	Yes
Live boating	1926.1087	Yes	Yes	Yes
Diving Equipment	1926.1090	Yes	Yes	Yes
Diving Recordkeeping Requirements	1926.1092	Yes	Yes	Yes
Internal Traffic Control	N/A	N/A	Yes	Yes
Traffic Movement Restriction Times	N/A	N/A	Yes	Yes

Exhibit 5-1 – Competent Person and Activity Hazards Analysis / AHA Requirements (Continued)

Safety and Health Requirement	OSHA /NYC Regulation	Competent/ Qualified Person	Training Required	Written Plan and AHA Required
Line Breaking	1910.119, 1926.54	Yes	Yes	Yes
Major Material Movements	N/A	N/A	Yes	Yes
Right-of-way Restrictions	N/A	N/A	Yes	Yes
Bicycles/Golf Carts	N/A	N/A	Yes	N/A
Noise Exposure	1910.95 and 1926.52	Yes	Yes	Yes
Traffic Control	General Duty Clause and NYS DOT Traffic Control Manual	Yes	Yes	Yes
Waste Transportation and Handling	• US 40 CFR part 262, subpart E • US 40 CFR section 263.20 • US 40 CFR section 239-282	Yes	Yes	Yes
Working on or around Water	1926.106	Yes	Yes	Yes

See attached legal compliance register. Note that AHA forms will be used for specific activities.

A permit must be completed for any drilling or excavation greater than 50 feet that is performed in the New York City area. The Parsons subcontractor will be responsible for completing and submitting drilling permits.

6.0 RISK REGISTER

Parsons shall continually identify project SH&E risks and seek effective and reliable means to control these risks to an acceptable level. From these identified SH&E risks, additional policies, procedures, equipment, compliance programs, special training, or PPE required to control the risk of project hazards shall be developed, communicated, monitored, and adjusted as needed.

Hazard analysis and risk assessment planning, the basis of the risk register, is an ongoing process occurring throughout the life of the project. Hazard analysis and risk assessment planning should address items such as: routine and non-routine activities; activities of all persons having access to the workplace (including contractors, secondary-tier contractors, visitors, client representatives, and/or the general public); any outside hazards that might impact the workplace or the people in the workplace; hazards associated with materials or equipment being used in the workplace; any changes or modifications in design, processes, legal obligations, safety system changes; and any human factor or capability issues.

See Appendix D for a risk register for typical NYSDEC activities. The risk register will be updated for all proposed tasks to be performed. AHAs will be used to assess risk at the task level.

7.0 TRAINING, CERTIFICATIONS, QUALIFICATIONS, AND COMPETENCIES

7.1 TRAINING

The program has a comprehensive SH&E training program tailored to the scope of work. All employees receive a general orientation upon assignment to the program. Office-based employees or field employees who spend a significant portion of their time in an office also receive specialized office training (see ESHARP Guidebook, Volume 1 – Project, Section 7 for additional detail).

All personnel performing activities covered by this plan must be trained in accordance with the requirements of 29 CFR 1910.120(e) if hazardous materials are known or expected during the field activities. The Project Manager will verify and document that all Parsons and subcontractor personnel meet the applicable training requirements prior to the start of site work, including:

- OSHA 29 CFR 1910.120 initial 40-hour training.
- OSHA annual eight-hour refresher training within the last year.
- OSHA eight-hour supervisory training for on-site managers and supervisors.
- AED/CPR/First aid/Bloodborne Pathogens – At least one Parsons and/or subcontractor employee will have American Red Cross (or equivalent) first aid and CPR training, and will be present onsite at all times when work is occurring.
- Hazard Communication – as per 29 CFR 1910.1200 and the Hazard Communications Defined Practice.

All personnel shall be monitored for training by the Program Safety Manager or their designee who maintains a record of training which identifies the expiration dates for applicable certifications. Safety training for project personnel will be based primarily on their work activities and corresponding risk of exposure to hazardous substances and health hazards. See Appendix E for the Training Matrix and list of typical training required to complete work on this program.

Records of completed training for Parsons employees are maintained in *Learning* through Workday and on the Program ParShare site. Copies of Parsons employee training completion records and certificates can be obtained by contacting the appropriate Project Manager.

7.2 DRIVER SAFETY TRAINING

Driving around New York State presents a key risk if not controlled. All drivers will abide by the following rules:

- Do not drive when overly fatigued
- Check the weather forecast and posted travel restrictions
- Plan your route ahead of time and be prepared for construction and detours
- Follow all posted traffic signs and signals
- Drive defensively, be aware of other drivers and pedestrians at all times
- Inspect your vehicle for safety issues (tires, lights, brakes, mirrors) do not drive is unsafe
- Do not use ANY electronic devices while driving, including hands free and Bluetooth enabled

Fleet Vehicle Safety and Corporate Policies and Procedures can be found at the link below or by searching "Fleet Management" on PWeb.

- Parsons Fleet Management Home

8.0 CONTRACTOR QUALIFICATION, MANAGEMENT, AND SITE-SPECIFIC SH&E PLANS

8.1 CONTRACTOR QUALIFICATION

Project procurement procedures require that all subcontractors submit prequalification documentation by logging into the Parsons online Contractor Safety Evaluation (CSE) Program. Their documentation will be evaluated by the Program Safety Manager and Project Manager. The Project Manager must also complete a Contractor Risk Evaluation Form (CREF) once the CSE Safety Grade is **"complete"**. All contractors to be engaged in providing field services shall pass this contractor qualification process prior to engagement. A mitigation plan may be required for any subcontractor with a grade of C or lower at the discretion of the Program Manager and Program Health and Safety Manager. The mitigation plan must be approved by the Program Safety Manager prior to issuing a contract for the work.

Subcontractors must also complete site orientation training, provide certificates that their personnel have been trained and are competent to perform the assigned duties, and provide certificates of training for permitted activities, such as drilling, lifting operations, hazard communication etc. as required by ESHARP and this PSHEP.

8.2 CONTRACTOR MANAGEMENT

Contractors are accountable and responsible for their employees and work activities. However, the PM shall ensure that contractors' work (and that of their secondary-tier subcontractors) is:

- Being performed in compliance with the contract;
- Being managed consistent with the project's SH&E processes and with the ESHARP Procedure; and,
- Meeting the project's SH&E expectations.

The PM shall conduct sufficient SH&E alignment meetings, kickoff and pre-mobilization meetings, look-ahead meetings, progress meetings, inspections, audits, and other routine meetings to gauge the contractors' progress and understanding of the work. Such meetings shall include any secondary-tier subcontractors, when applicable.

Project Managers conduct the Mobilization/Kickoff Safety Meeting on the first day of subcontractor mobilization in the field and at the work site. The meeting includes the completion of a Site-Specific Risk Review Checklist combined with a walkthrough of the work area to locate items on the pre-bid risk analysis checklist.

Review forms/checklists are on the Safety SharePoint Site on PWeb and are also included in Appendix F .

8.3 CONTRACTOR SITE-SPECIFIC SAFETY, HEALTH, AND ENVIRONMENTAL PLANS (SSHEPS)

Subcontractors must establish their own safety program for their work and employees. Contract specifications require all subcontractors to accept the Parsons' PSHEP and prepare their own SSHEP for work activities the subcontractor has responsibility for performing. The subcontractor will present the SSHEP to the Parsons' Project Manager at least 10 days before site mobilization. At a minimum, subcontractor plans must meet the requirements of this PSHEP and provide SH&E equipment and safeguards suitable for the hazards involved. This PSHEP may not cover all potential hazards on every project, and subcontractors must ensure that appropriate SH&E information is available for all of the subcontractor's project tasks.

All PSHEP requirements for Parsons' personnel (e.g., training, substance abuse screening, incident reporting, etc.) also apply to subcontractor personnel and will be included in the SSHEP, if applicable.

9.0 NEW EMPLOYEE AND VISITOR ORIENTATION

9.1 NEW EMPLOYEE ORIENTATION

Each person assigned to a project team (including new Parsons employees, existing Parsons employees who are new to the project, contractors, secondary-tier contractors, teaming and JV partner employees, suppliers, vendors, client representatives, members of the leadership team, and other stakeholder employees) shall receive an initial project- and site-specific orientation beginning on their first day of work.

No worker shall start work on tasks for which he or she does not have the verified knowledge, skills, training, certifications, qualifications, and competencies to complete successfully, consistent with the risk control strategies defined in the risk register and its associated risk assessments.

The Talent Management Department has a comprehensive employee orientation program. The SH&E personnel help to develop applicable SH&E sections of the orientation and meet with new employees to review site procedures and requirements. Topics include:

- SH&E roles and responsibilities
- PSHEP overview
- Project rules and disciplinary policies
- Reporting incidents and unsafe conditions
- Hazards communication
- Emergency/evacuation plans
- Spill/release reporting and response actions
- Waste management
- Stormwater and wastewater management
- Other applicable environmental issues and regulatory requirements
- Project scope of work

All new employees on a project, including new hires and transfers, must be trained in this PSHEP and site-specific requirements.

9.2 VISITOR ORIENTATION

Visitors to a project shall receive an orientation briefing appropriate for their visits. The orientation will include the following items:

- Alarms, emergency and evacuation procedure.
- Emergency assembly location.
- Smoking/Tobacco Use Policy.
- Weapons Policy.
- Drug and Alcohol Policy.
- Applicable security provisions.
- Stop Work' authority and effective implementation.
- Personal protective equipment requirements. (Refer to the Personal Protective Equipment Defined Practice.)
- Reporting requirements of injuries, accidents and near misses.
- Site hazard review and other specific procedures required by the site.
- Any other provisions specified in the PSHEP that are applicable to visitors.

The visitor's signature shall confirm understanding of the orientation and a summary of the items discussed should be listed on the Toolbox Safety Meeting form (See Appendix F) . Visitors must be escorted continually by a knowledgeable member project team.

10.0 HAZARD IDENTIFICATION AND TASK RISK ASSESSMENT

10.1 AHA AND/OR TASK RISK ASSESSMENT

Parsons and its subcontractors are required to conduct an AHA for all aspects of the work. An AHA includes the following steps:

- Identify each task required to complete a project and break the tasks into a series of steps.
- Identify the hazards associated with each task step.
- Identify the specific hazard control measure used for each task step in accordance with the order-of-precedence method of control (see Section 10.3).

Project Managers can use the following list to determine the Activity Hazards Analyses task. Developed AHAs for the most common project related activities are provided in Appendix G, while templates and the Daily Tailgate Briefing Form are also included in Appendix F .

- Premobilization inspection. Conduct an initial site inspection for prejob planning. The inspection should cover potential exposures such as the location of electrical lines, underground utilities, nearby structures, roadways and traffic conditions, site security needs, public exposures, and other potential exposures. Environmental risks should be included in this inspection (e.g., potential for wastewater discharges, adequacy of planned stormwater controls, planned waste management handling, measures to prevent spills/releases), etc.
- Material handling. Consider the size and weight of equipment/drums, how equipment will be used, how equipment is set up and protected, and safety and maintenance inspections of material handling and rigging equipment. Consider employee training in use of equipment and ergonomic issues when engaged in manual material handling activities.
- PPE. Consider the type of PPE required for the proposed site activities (eye, head, foot, respiratory, hearing and hand protection, and types of special protective clothing) and how wearing each item might limit mobility or increase the need for rest periods during warmer temperatures.
- Employee training. Review the safety training needs for each task and the assigned employees. Training should include initial site SH&E orientations and hazard communication training. Some activities (e.g., excavation, confined space entry, heavy equipment operations, handling hazardous materials, stormwater and wastewater management, response to spills/releases, waste management, and hazardous plant process operations) may require special training.
- Process safety management. At process sites where hazardous chemicals are stored or used, comply with special considerations and regional, municipal, local, and OSHA process safety management regulations.

Exhibit 10-1 illustrates the AHA template form while Exhibit 10-2 shows the training record to be completed and kept on file for each Activity Hazards Analysis.

Exhibit 10-1 – Activity Hazards Analysis (AHA) Template

<table>
<tr><td>Activity/Work Task:</td><td colspan="6">Overall Risk Assessment Code (RAC) (Use highest code)</td></tr>
<tr><td>Project Location:</td><td colspan="6">Risk Assessment Code (RAC) Matrix</td></tr>
<tr><td>Contract Number:</td><td rowspan="2">Severity</td><td colspan="5">Probability</td></tr>
<tr><td>Date Prepared (MM/DD/YY):</td><td>Frequent</td><td>Likely</td><td>Occasional</td><td>Seldom</td><td>Unlikely</td></tr>
<tr><td rowspan="2">Prepared by (Name/Title):</td><td>Catastrophic</td><td>E</td><td>E</td><td>H</td><td>H</td><td>M</td></tr>
<tr><td>Critical</td><td>E</td><td>H</td><td>H</td><td>M</td><td>L</td></tr>
<tr><td>Reviewed by (Name/Title):</td><td>Marginal</td><td></td><td>M</td><td>M</td><td>L</td><td>L</td></tr>
<tr><td>Employer / GBU: Parsons</td><td>Negligible</td><td>M</td><td>L</td><td>L</td><td>L</td><td>L</td></tr>
<tr><td rowspan="4">Notes: (Field Notes, Review Comments, etc.)
References:</td><td colspan="6">Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (See above).
The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.</td></tr>
<tr><td colspan="4">“Probability” is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.</td><td colspan="2">RAC Chart</td></tr>
<tr><td colspan="4">“Severity” is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible</td><td colspan="2">E = Extremely High Risk
H = High Risk</td></tr>
<tr><td colspan="4">Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on AHA. Annotate the overall highest RAC at the top of AHA.</td><td colspan="2">M = Moderate Risk
L = Low Risk</td></tr>
</table>

Job Steps	**Hazards**	**Controls**	**P**	**S**	**RAC**

Note: This page will continue for more pages, the header will continue with subsequent entries. ParShare link: AHA Template

Exhibit 10-1 – Activity Hazards Analysis Template (Continued)

Activity/Work Task: Entering Excavation			Overall Risk Assessment Code (RAC) (Use highest code)			
Project Location:			Risk Assessment Code (RAC) Matrix			
Job Steps (Contd)	**Hazards**	**Controls**		**P**	**S**	**RAC**

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements

Note: This page will continue for more pages, the header will continue with subsequent entries. ParShare link: AHA Template

Exhibit 10-2 – SH&E Activity Hazards Analysis Training Record

PARSONS

SH&E Activity Hazards Analysis Training Record

Job Number:		
AHA Number:		
Job Location		
Date:		
Name of Trainer:		
Subjects Covered:		
Training Aids Used:		

Attendees – Please Sign Name Legibly Below

Use additional sheets if necessary.

10.2 PORTFOLIO RISK ANALYSIS

Before work begins, Project Managers will lead a team that performs a risk analysis at each work site to identify hazards and risks that require specific control measures.

Chemical hazards are expected to be a significant risk and may be encountered during subsurface related activities. Parsons oversight will be conducted by an employee trained in Hazardous Waste Site Operations and Emergency Response (HAZWOPER). If staining, residual product, odors or other signs of subsurface contamination are encountered additional monitoring will be instituted as necessary to assess the potential for exposure.

Chemical Hazards - Contaminant Characterization and Potential Routes of Exposure

The main routes of exposure for field personnel include:

- Inhalation of contaminant vapors;
- Inhalation of contaminated particulate matter;
- Ingestion of contaminated material;
- Dermal absorption of contaminated material;
- Dermal contact with poisonous plants; or
- Injection of contaminated material.

Site personnel can reduce their exposure potential by:

- Using the proper PPE;
- Practicing contamination avoidance;
- Following proper decontamination procedures; and
- Observing good personal hygiene.
- Maintaining proper labeling of containers, keeping an inventory of any hazardous materials brought onsite, and maintaining a copy of each chemical's Safety Data Sheet (SDS) onsite.

Physical Hazards - A variety of physical hazards may be present at any of the sites in this portfolio, but these hazards are similar to those associated with any field project. Potential hazards/risks related to this portfolio of projects are listed below:

- Driving – Long distances, urban and congested environments and different types of weather and times of day.
  - Do not drive when overly fatigued
  - Check the weather forecast and posted travel advisories
  - Plan your route ahead of time and be prepared for construction and detours
  - Follow all posted traffic signs and signals
  - Drive defensively, be aware of other drivers and pedestrians at all times
  - Inspect your vehicle for safety issues (tires, lights, brakes, mirrors) do not drive is unsafe
  - Do not use ANY electronic devices while driving, including hands free and bluetooth enabled
- Equipment / Drill Rig Operation – heavy equipment and drill rigs will be used on site, primary hazards include struck-by, vehicle accident and contact with utilities
  - Conduct a thorough subsurface and overhead clearance and inspect the area before drilling or performing any excavation activities maintain adequate space from all identified utilities
  - Inspect all equipment daily before use, document inspection and take any unsafe equipment out of service
  - Only use trained and authorized operators

- Establish an exclusion zone around the rig and heavy equipment and do not allow any unauthorized personnel to enter
  - Keep body and hands out of hazard areas, communicate plans for operating and handling equipment

- Biological – Tick and mosquito borne illnesses, insect stings and bites, poisonous plants.
  - Know how to identify poisonous plants (poison ivy/poison oak) and avoid contact as much as possible.
  - If available, apply an over-the-counter barrier cream, such as Ivy Block® to prevent contact with plant oils.
  - Wash hands and arms immediately with soap and water if skin contacts the plants.
  - Wear long pants with socks pulled over legs to prevent skin contact with plants and insects.
  - Inspect yourself and your Team members carefully for insects or ticks after being outdoors.
  - Spray any wasp/hornet nests with an insect repellant from a safe distance.

- Lightning - personnel shall follow the 30/30 rule - stop field activities and seek shelter when the time between seeing the lightning and hearing the thunder is less than 30 seconds. When the lightning has subsided for 30 minutes, work activities can resume.
- Traffic – Both onsite and offsite.
  - Safety vest shall be worn and barricades placed around the work area.
  - Use caution tape or barricade fencing where warranted to keep unauthorized personnel from entering the work area.

- Material Handling – proper lifting/ergonomics, handling of glass bottles.
  - Utilize proper lifting procedures when loading and unloading heavy equipment.
  - Bend at the knees when lifting rather than bending the back.
  - Use a mechanical lifting device or a lifting aid such as hand carts, drum dollies or lift gates when lifting or moving heavy objects.
  - To minimize weight, do not fill drums more than ¾ full.
  - Avoid lifting over 50 lbs., use a team lift

- Hand tools/Power Tools
  - Equipment will be inspected for defects prior to use.
  - Eye protection is to be worn at all times on site.
  - Employees using tools that may subject their hands to an injury, such as cuts, abrasions, punctures, or burns will wear protective gloves.
  - Loose or frayed clothing, dangling jewelry, or loose long hair will be removed or protected when working with power tools.
  - A GFCI will be used with all power tool operations.
  - Shielding or guarding will be in effect if applicable.

- Environmental – cold/heat related illnesses, animals, insects, poisonous plants/vegetation. See previous sections for information related to Environmental hazards.
- Waste handling – waste handling will be minimized to the extent possible. All wastes generated on site will be containerized and disposed of in accordance with all federal, state, and/or local guidelines. A container appropriate for the waste will be used and labeled.
- Slips/Trips/Falls/Cuts
  - Utilize proper housekeeping practices, such as removal of debris and tools from the work area to keep the area clear of trip hazards.
  - Use caution tape or barricade fencing where warranted to keep unauthorized personnel from entering the work area.

- Replace manhole covers securely to prevent tripping and vehicle accidents.
- Use hose cutters when cutting piping.
- Walkways and workspaces will be kept clear of cords, hoses, pipes, etc. that cause trip hazards.
- If trip hazards cannot be removed from the work area, they shall be taped down and cones shall be placed to identify the hazard.
- Wear proper gloves to protect against hazards.

- Electrical Hazards
  - Inspect all electrical equipment and extension cords prior to use.
  - All electrical circuits and equipment must be grounded in accordance with the NEC regulations. Use three-pronged plugs and heavy-duty extension cords.
  - Spark producing equipment is not to be used in operating remedial system buildings.
  - Lockout/Tagout procedures will be in effect if equipment is to be repaired.
  - A GFCI is required when using extension cords.
  - Workers must not have wet hands or be standing in water while plugging/unplugging energized equipment.

- Hot Work
  - A hot work permit will be completed prior to the start of the work.
  - The Site Supervisor will conduct a safety briefing on hot work rules and procedures, and all hot work participants will sign the permit.
  - Hot work will not be performed if there is a possibility of an explosive atmosphere or an oxygen-enriched atmosphere.
  - The Site Supervisor will designate a person for fire watch duty, who will have access to a properly rated fire extinguisher and will remain on-duty for one-half hour after the hot work is complete.
  - All hot work equipment will be inspected daily, prior to use. If the equipment is found to be defective, it will be removed from the site, or tagged with a "Do Not Use" sign until it is repaired.
  - All welding and cutting personnel will be trained in the safe operation of their equipment.
  - Refer to the Parsons Hot Work Procedure for complete details.
  - Excessive Noise - Use hearing protection during loud mechanical operations such as drilling, Geoprobing and excavation operations, inside remediation buildings when equipment is operating loudly or in other high decibel situations.

- Airborne Particulates (ears, eyes, nose, mouth, inhalation)
  - Eye protection is to be worn at all times on site.
  - Use water and wet methods to reduce dust generation to the extent possible
  - Respiratory protection is to be worn when site activities cause excessive particulates (such as mixing concrete, drilling through pavement, performing carbon change-outs, etc.).

- Ladder Safety
  - Ladders must be inspected prior to use. Any damaged ladder will be discarded immediately.
  - Painted ladders are forbidden.
  - Never stand on the top step of the ladder.
  - Extension ladders must extend 36" beyond work area.
  - Pitch ladders at a 4:1 ratio.
  - Extension and straight ladders must be tied off.
  - Fall protection must be worn when working at heights six feet or more above ground.

- Site Security
  - Do not permit anyone who is not properly trained and outfitted with the appropriate PPE to enter the Exclusion or Contamination Reduction Zones (this includes Parsons personnel, clients, regulators, etc.)

- o Use caution tape or barricade fencing where warranted to keep unauthorized personnel from entering the work area.
- o On sites where it is believed that security is an issue, two employees will be used for all field work. The “buddy-system” will be in place and the two employees will be in constant communication and within each other’s line of sight. There will be a cellular phone available to call 911 if a violent condition presents itself.
- o When acts of violence occur or when an employee(s) feels that they are being placed in a threatening position they must immediately leave the site.
- o All potential acts of violence or threats by non-Parsons personnel must be immediately reported to the Project Manager and the Health and Safety Officer. The situation will be discussed to determine future action on the site in question.
- o If any Parsons employee notices suspicious persons or activities in a Parsons office or in the vicinity of a work area, he or she should immediately report the observation to his or her supervisor or the Project Manager.

Potential Chemicals of Concern

The potential chemicals of concern at sites in this portfolio are those associated with volatile organic compounds (VOCs); total petroleum hydrocarbons (TPH); polynuclear aromatic hydrocarbons (PAHs), perfluorooctanoic acid (PSFA), and perfluorooctanesulfonic acid (PFOS). Site workers could be exposed to these chemicals via inhalation of volatiles, dermal contact, injection, and/or incidental ingestion of contaminated material. A brief summary of the potential project chemical hazards is presented in the following paragraphs and the applicable regulatory cleanup criteria and/or action levels for the project COCs are listed in the table below.

Volatile organic compounds, which include PFPAs and PFOSs, are a class of compounds characterized by a high vapor pressure and low water solubility and include a variety of chemicals, some of which may have short- and long-term adverse health effects (and include benzene, toluene, ethylbenzene, and xylenes (BTEX) and naphthalene, hydrogen sulfide, methane and landfill gases). VOCs are components of crude oil and refined petroleum fuels. Most sites in this portfolio are covered with vegetation and the source areas are greater than three feet below surface grade. Therefore, VOC levels in the breathing zone should be consistently below health-based United States Environmental Protection Agency (USEPA) regulatory standards. TPH and PAHs are semi-volatile compounds which do not readily volatilize. TPH and PAH exposure at this site will be mainly through dermal contact.

Precautions to mitigate risks associated with VOCs, TPH, and PAHs include limiting the direct contact between subsurface soil/groundwater and workers with access to the soil/groundwater and reducing the time after contact that the impacted material remains in contact with PPE, clothing, or the skin. Note that most sites are covered with vegetation which serves as a barrier between the source area and onsite workers. Additional methods of reducing exposure in the event that a worker comes in contact with impacted soils/groundwater include:

- Wearing clothing and personal protective equipment that limits the skin area available for contact with the impacted material. Examples include gloves, hard hats, long sleeve shirts, and long pants (all are required to work on this project).
  - o Change work clothing that becomes soiled with impacted material. Dermal exposure can occur via absorption through clothing when it becomes wet.
  - o Do not eat, smoke, or chew gum or tobacco while working where the subsurface is being disturbed. This will limit hand-to-mouth activities that increase exposure to subsurface soils and groundwater.
  - o Wash hands frequently and always before eating, smoking, chewing gum/tobacco, or similar activities. This will help prevent the spread of any impacted material on the hands to items placed in the mouth.

- o Do not apply sunscreen or similar substances without washing hands. The application of these substances can provide a mechanism by which impacted material can be trapped next to the skin.
- o Cover cuts, scrapes, and other open skin areas. Injured skin allows compounds to be more readily absorbed into the body than intact skin.
- o Wash hands and other exposed areas of skin before leaving the site. This limits the amount of time that impacted material is in contact with the skin, thereby reducing the amount of the chemicals that can be absorbed through the skin.
- o Change soiled work clothes before or shortly after leaving the site and wash them prior to wearing them again. Gloves and other similar items that come into direct contact with impacted material should be washed or properly disposed.
- o Minimize the creation of dust or splashes during groundwater sampling as much as possible. For example, keeping excavated soil moist will reduce the release of soil particles to the air.

Table 10.1 – Primary Chemicals of Concern

Chemicals of Concern	Groundwater concentrations	Monitoring Equipment	Action Levels	Possible Routes of Exposure and Action Taken
Benzene	Various – See site specific data, if applicable	Draeger Tube	**OSHA:** PEL= 5 ppm **ACGIH:** TLV/TWA = 0.5 ppm **NIOSH:** IDLH = 500 ppm	inhalation, skin absorption, ingestion, skin, and/or eye contact (use appropriate PPE)
Toluene, Ethylbenzene, Xylenes	Various – See site specific data, if applicable	Draeger Tube	**OSHA:** PEL= 200 ppm (toluene), 100 ppm (EX) **ACGIH:** TLV/TWA = 20 ppm (TE), 100 ppm (xylenes) **NIOSH:** IDLH = 500 ppm (toluene), 800 ppm (E), 900 ppm (xylenes)	inhalation, skin absorption, ingestion, skin, and/or eye contact (use appropriate PPE)
Naphthalene (Polynuclear Aromatic Hydrocarbons)	Various – See site specific data, if applicable	Draeger Tube	**OSHA:** PEL= 10 ppm **ACGIH:** TLV/TWA = 10 ppm **NIOSH:** IDLH = 250 ppm	inhalation, skin absorption, ingestion, skin, and/or eye contact (use appropriate PPE)
Total Petroleum Hydrocarbons	Various – See site specific data, if applicable and VOCs below	NA	**NA**	skin absorption, ingestion, skin, and/or eye contact (use appropriate PPE)
Hydrogen Sulfide	NA-abandonment and closure of old oil wells	H2S personal monitor	1 – TWA 5 – STEL (ppm)	Inhalation General ventilation, well venting, distance from source, remove ignition sources

Chemicals of Concern	Groundwater concentrations	Monitoring Equipment	Action Levels	Possible Routes of Exposure and Action Taken
VOCs	Various – See site specific data, if applicable	Photoionization Detector (PID)	a. < 1 ppm b. 1-5 ppm c. 5-50 ppm d. 50-200 ppm	a. None (Level D) b. Implement engineering controls to suppress vapor levels. Monitor for benzene with Draeger tube. (Level D) c. Take 3 consecutive readings. If confirmed, stop work and re-evaluate. Continue engineering controls to surpress vapor levels. (Contact HSE and upgrade to Level C) d. Work will not continue pst 50 ppm. Continue engineering controls to surpress vapor levels. (Level C)
Methane / Landfill gases	Various	Methane meter	<10 % LEL	Inhalation Risk of fire Air monitoring Ventilation. Eliminate ignition sources

Notes:

OSHA Permissible Exposure Limits (PELs) as published on the OSHA website

IDLH = immediately dangerous to life and health

ppm = parts per million.

TWA = time weighted average

mg/m3 = milligrams of contaminant per cubic meter of air

ACGIH TLV = American Conference of Government Industrial Hygienist Threshold Limit Value

All readings collected with PID shall be sustained reading of 30 secs or more and collected within the breathing zone and/or work area.

Readings will be taken with the PID at the beginning of the day, changes in work activities, and during all sampling activities. If readings exceed Level D, then stop work, leave the area and allow to ventilate. If action levels are maintained then consult with Project Manager or Safety Officer on PPE appropriately.

Community Air Monitoring Plans (CAMPs) will be developed and implemented as necessary for remediation/construction projects. The NYSDOH Generic Community Air Monitoring Plan guidance will be used and referenced for project specific CAMPs.

10.3 FIVE HAZARD CONTROL MEASURES – ORDER OF PRECEDENCE

Site SH&E hazards and risks are controlled using one or more of the control measures listed below in order of precedence:

1. **Engineer/design to eliminate or minimize hazards**. A major component of the design phase is to select appropriate features to eliminate a hazard/risk and render it fail-safe or provide redundancy using backup components.

2. **Guard the hazard**. Hazards that cannot be eliminated by design must be reduced to an acceptable risk level by guards or isolation devices that render them inactive.

3. **Provide warnings**. Hazards or risks that cannot be totally eliminated by design or guarding are controlled through using a warning or alarm device.

4. **Provide special procedures or training**. When design, guarding, or warnings cannot eliminate hazards/risks, develop procedures, training, and/or audits to ensure safe and environmentally compliant completion of work. Training cannot be a substitute for hazard elimination when life-threatening hazards are present.

5. **Provide PPE**. To protect workers from injury, the last method in the order of precedence is the use of PPE, such as hard hats, gloves, eye protection, life jackets, and other protective equipment with the understanding that bulky, cumbersome, and heavy PPE will introduce additional hazards which will need to be evaluated.

For work activities that involve HAZWOPER activities the following work zones will be established:

- **Exclusion Zone**

  The exclusion zone at this site will be limited to the area immediately surrounding the work activity, the building, or designated by the Project Supervisor or Site Safety Officer (SSO). Caution tape or other visible marker may be used to delineate this zone. Unprotected onlookers should be located 50 ft. upwind of decommissioning, or demolition activities. In the event that action levels are exceeded in the breathing zone, then all personnel in the exclusion zone must stop work, evacuate, and evaluate the situation. If the actions levels continue to exceed recommended limits, then an upgrade to the level of personal protective equipment is required on properly trained and certified crew members to continue work.

- **Decontamination Zone**

  A decontamination area will be set up for equipment decontamination. Equipment decontamination will consist of dry removal of material followed by water washing of the equipment. Personnel decontamination must take place prior to leaving the decontamination area and prior to entering any support zone, personnel hygiene facilities, or before eating, drinking, or smoking. Any decontamination water will be staged on-site for appropriate disposal. The site decontamination area(s) is yet to be delineated and presently undecided if the area will be a fixed station or 'mobile'

- **Support Zone**

  The support zone will be located upwind to both the exclusion zone and the decontamination zone. Break areas, operational direction and support facilities (to include supplies, equipment storage, and maintenance areas) will be located in this area. No equipment or personnel will be permitted to enter the support zone from the exclusion zone without passing through the personnel or equipment decontamination zone first. The work zones (Exclusion & Contamination Reduction Zone (CRZ)) will be setup and delineated prior to the needed work task(s) commencing; the support zone will be outlined & discussed at that appropriate time.

[Include a list of the chemicals that will be used on site and include a copy of the SDS in the AHA(s)]

- **Decontamination Procedure**

Level D or Modified Level D protection will be worn for initial entry on-site and initially for all activities. If air concentrations exceed action levels, workers will employ engineering controls first before upgrading the level of protection. Personal decontamination may be necessary for activities involving the use of Level C or Level B PPE. Exhibit 10.3 includes the proper decontamination procedures that may be implemented if chemical contamination is present and PPE protection greater than Level D is used. The SSO will determine the proper procedures for decontamination based on the work activities and amount of contamination. All site personnel engaging in intrusive activities will have their breathing zones monitored in accordance with Table 10.1.

[This is where you would insert language on a respirator cartridge changeout schedule based on the Wood Math model. Including a general description of biological, physical and other hazards that may be present on a site is permissible, but each hazard mentioned must also be identified in an AHA Respirator use is not anticipated for this Program].

10.4 HAZARD COMMUNICATION PROGRAM

All hazardous chemicals brought on-site by Parsons personnel or its subcontractors will be managed in accordance with 29 CFR 1910.1200 and the Parsons Hazard Communication Program. This will include: proper labeling, an inventory list of all hazardous materials brought onsite, and a copy of each SDS will be maintained onsite. The subcontractor will be responsible to maintain and have copies of SDS for materials used on site.

10.5 DECONTAMINATION

At a minimum, the procedures outlined below shall be followed for decontamination, when required:

- Remove soil and gross contamination from tools, monitoring equipment, boots, etc. using paper towels, handi-wipes, etc.
- Completely decontaminate soiled equipment in the work area using detergent and water and dispose of all cleaning materials as follows.
    - Due to the small quantity of waste generated during decontamination, it is allowable in most states to dispose of lightly contaminated materials (including gloves, rope, paper towels, etc.) in the site dumpster. It is important, however, to ensure that there is no chance of vapor generation or fluid leaking from the dumpster. At no time are materials containing free product to be disposed of in this manner. In this case, arrangements must be made for use of labeled drums and proper disposal.
- Wash hands and face thoroughly with soap and water before lunch or breaks, and as soon as practical after finishing work for the day.
- Particular care should be taken to protect any skin injuries. If open wounds exist on hands or forearms, handling chemicals should be restricted or eliminated.

Exhibit 10.3 - Decontamination Procedure

* Decontamination procedures can be modified by the Project Safety Manager or SSO based on work activities and potential contamination.

STATION	NAME	DESCRIPTION
Station 1	Segregated Equipment Drop	Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each will be contaminated to a different degree. Segregation at the drop reduces the probability of cross-contamination.
Station 2	Suit, Safety Boots, and Outer Glove Wash	Thoroughly wash chemically resistant suit, safety boots and outer gloves. Scrub with long-handle, soft-bristle scrub brush and copious amounts of Alconox/water solution. Necessary equipment includes: • Wash tub (30 gallon or large enough for person to stand in) • Alconox/water solution • Long-handle soft-bristle scrub brushes
Station 3	Suit, Safety Boots, and Outer Glove Rinse	Rinse off Alconox/water solution using copious amounts of water. Repeat as many times as necessary. Necessary equipment includes: • Wash tub (30 gallon or large enough for person to stand in) • Spray unit • Water • Long-handle, soft-bristle scrub brushes
Station 4	Outer Gloves Removal	Remove the outer gloves and deposit in individually marked plastic bags. Necessary equipment includes: • Plastic bag
Station 5	Canister, Air Tank, or Mask Change	If a worker leaves the exclusion zone to change a canister, mask or air tank, this is the last step in the decontamination procedures. The worker's canisters or tank are exchanged, new outer glove donned, and joints taped. Worker returns to duty. Otherwise the worker proceeds to Station 6. Necessary equipment includes: • Canisters, air tanks, or mask • Tape • Gloves
Station 6	Removal of Chemically Resistant Suit	With assistance of helper, remove suit. Deposit in container with plastic liner. Necessary equipment includes: • Container with plastic liner
Station 7	Inner-Glove Wash	Wash inner gloves with Alconox/water solution that will not harm skin. Repeat as many times as necessary. Necessary equipment includes: • Alconox/water solution • Wash tub • Long-handle, soft-bristle brushes
Station 8	Inner-Glove Rinse	Rinse inner-gloves with water. Repeat as many times as necessary. Necessary equipment includes: • Water • Wash tub

STATION	NAME	DESCRIPTION
Station 9	Respirator Removal	Remove face-piece. Avoid touching face. Wash respirator in clean, sanitized solution, allow to dry and deposit face-piece in plastic bag. Store in clean area. Necessary equipment includes: • Plastic bags • Sanitizing solution • Cotton
Station 10	Inner-Glove Removal	Remove inner gloves and deposit in container with plastic liner. Necessary equipment includes: • Container with plastic liner
Station 11	Field Wash	Wash hands and face. Necessary equipment includes: • Water • Soap • Tables • Wash basins or buckets • Clean towels
Station 12	Redress	If re-entering Exclusion Zone put on clean field clothes (e.g., Tyvek, gloves, etc.). Necessary equipment includes: • Table • Clothing The SSO will monitor the decontamination system for effectiveness.

11.0 ENVIRONMENTAL HAZARDS

11.1 HEAT RELATED ILLNESS

Project activities may take place during time periods where exposure to temperature extremes could occur. In order to minimize exposure to temperature extremes, project personnel shall be familiar with the health effects of exposure to temperature extremes and the control measures that can minimize exposure. Follow the Control of Work defined practice.

Training shall be provided to all employees to recognize heat illness hazards before starting to work outdoors.

Any employee experiencing or witnessing signs and/or symptoms of a heat related illness shall report the findings to their supervisor immediately.

Supervisors shall understand the procedures to follow when an employee exhibits symptoms consistent with heat illness, including emergency response.

Definitions

Acclimatization - a temporary adaption of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within 4-14 days of regular work for at least 2 hours per day in the heat.

Environmental Risk Factors - working conditions that create the possibility that heat illness could occur, including air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing and personal protective equipment worn by employees.

Heat Illness - a serious medical condition resulting from the body's inability to cope with a particular heat load, and includes heat cramps, heat exhaustion, heat syncope and heat stroke.

Heat Wave - a sudden and temporary rise of temperature above the seasonal average for a particular region, which lasts for a prolonged period of time. A heat wave can greatly increase the risk of heat related illnesses.

Personal Risk Factors - an individual's age, degree of acclimatization, health, water consumption, alcohol consumption, caffeine consumption, and use of prescription medications that affect the body's water retention or other physiological responses to heat.

Preventive Recovery Period - a period of time to recover from the heat in order to prevent heat illness.

Shade - blockage of direct sunlight. Canopies, umbrellas and other temporary structures or devices may be used to provide shade. One indicator that blockage is sufficient is when objects do not cast a shadow in the area of blocked sunlight. Shade is not adequate when heat in the area of shade defeats the purpose of shade, which is to allow the body to cool. For example, a car sitting in the sun does not provide acceptable shade to a person inside it, unless the car is running with air conditioning.

Signs and Symptoms of Heat Illnesses

Heat Rash – or prickly heat, occurs in hot and humid environments where sweat is not removed from the skin. Usually disappears when worker returns to cool environment.

Heat Cramps – muscle contractions from the loss of fluids/electrolytes due to sweating. Occurs when workers perform hard physical labor in a hot environment. Most common in the arms and legs. Cramping can occur after work has stopped.

Heat Exhaustion – inadequate blood circulation from stress due to constant heat. The whole body, especially the circulatory system, is extremely stressed. Possible symptoms include: pale, flushed face and neck; clammy skin; heavy sweating; fatigue; shortness of breath; headache; dizziness or fainting; nausea and vomiting; and rapid heartbeat and breathing.

Heat Stroke – body's failure to regulate its' temperature. The most serious stage of heat illness. Symptoms include: dizziness and confusion, red, hot, dry skin; nausea and vomiting; very little sweating; rapid pulse; high body temperature, 105° F or higher; convulsions, and fainting.

Heat Illness Prevention

Prevention of heat related illness in extreme temperature - project personnel shall consider implementing a Physiological monitoring program, include monitoring with a Wet Bulb Globe Temperature (WBGT) and implementing work rest regiments. The field team shall be encouraged to drink plenty of liquids to replenish electrolytes. The field team shall also construct a shaded rest area for workers to take breaks.

Prevention of heat related illness may call for establishing work teams to rotate to minimize heat related illnesses.

Heat Illness Treatment

Heat Cramps - take water every 15 to 20 minutes. Drinking an electrolyte replacement (like Gatorade) may help.

Heat exhaustion - Get medical help. Don't leave the person alone. While waiting, remove worker to cool place to rest; remove as much clothing as possible; give water and electrolytes; and don't allow person to get chilled.

Heat Stroke – Call 911 immediately. While awaiting medical help, get victim into cool area, fan vigorously, apply cool water to clothing or skin, and apply ice packs under arms and to the groin area.

Heat Waves

Heat illness prevention during heat waves means taking extra measures.

- More vigilance - supervisors/employees watch others very closely and provide more frequent feedback during work activities. Site workers shall avoid working alone and utilize the “Buddy System”, watch each other and closely monitor/report an employees’ condition. Personnel shall be accounted for their whereabouts throughout the work shift and at the end of the day.
- More water - employees should drink small quantities of water more frequently before, during and after work. There should be extra supplies of water for replenishment, encourage employees to consult with their doctor on salt/mineral replacement.
- More cooling - use other cooling measures in addition to shade, spraying body with water/wiping with wet towels and taking additional/longer breaks in the shade.
- Change schedule - work activities may be started earlier on, later in the evening, split-up work shifts and avoid working during the hotter parts of the day. Work shifts can be cut short or stop work.
- Change meals - encourage employees to eat smaller/or more frequent meals (less body heat during digestion than with big meals), choose foods with higher water content (for example, fruits, vegetables, and salads).

Acclimatization warning - personnel should allow the body time to adjust to sudden, abnormally high temperatures or other extreme conditions. Even employees previously fully acclimatized are at risk for heat illness.

Environmental and Physiological Factors

- Average ambient air temperature 96°F (75-116°F)
- Average humidity 29% (12% - 55%)
- Average wind speed 7 mph
- Average core body temperature 104°F (98 -108°F)

See attached risk register for typical project related activities. The risk register must be updated for any task that is to be performed and has not been included on this list.

Provision of Water

Sufficient amounts of cool water shall be available and replenished at all times with at least one quart per employee per hour for the entire shift.

Easy access to clean and cool water shall be available to encourage frequent drinking.

Access to Shade

A Preventative Recovery Period (PRP) is necessary if an employee is suffering from heat illness or believes that a rest break is needed to recover from the heat.

Access to shade shall be permitted at all times. Employees shall have access to an area with shade that is either open to the air or provided with ventilation or cooling for a period of no less than 5 minutes.

Measurement

Portable heat stress meters or monitors are used to measure heat conditions. These instruments can calculate both the indoor and outdoor WBGT Index according to established American Conference of Governmental

Industrial Hygienists (ACGIH) Threshold Limit Value (TLT) equations. With this information and information on the type of work being performed, heat stress meters can determine how long a person can safely work or remain in a particular hot environment.

11.2 COLD RELATED ILLNESS

Ample breaks will be taken during cold ambient conditions and proper clothing must be worn to protect the employee. If extreme weather conditions are present, the Project Manager and/or the Site Safety Officer must make a determination regarding cold stress monitoring and whether conditions are too extreme to allow safe execution of the work.

Acclimatization warning - Personnel should consider allowing the time to adjust to sudden, abnormally low temperatures or other extreme conditions. Even employees previously fully acclimatized are at risk for cold related illness.

Cold stress symptoms and include the following:

- Frostnip
  - Frostnip occurs when the face or extremities are exposed to cold wind, causing the skin to turn white.
- Frostbite
  - Frostbite entails an excessive drop in tissue temperature resulting in damage. Symptoms of frostbite include:
    - Skin discoloration to a white or grayish-yellow, progressing to reddish-violet, and finally black as tissue dies
    - Pain may be felt at first, but subsides
    - Blisters may appear
    - Coldness and numbness of affected part
  - When the outer layer of skin becomes frostbitten, the skin has a waxy or whitish appearance and is firm to the touch (the skin underneath is still resilient). In cases of deep frostbite, the tissues are cold, pale, and solid. Frostbitten skin is highly susceptible to infection, and therefore gangrene. First symptoms are usually an uncomfortable sensation of coldness, followed by numbness. There may be a tingling, stinging, aching feeling or cramping sensation. The victim is usually unaware of the frostbite. The three degrees of frostbite are:
    - First - Freezing without blisters or peeling
    - Second - Freezing with blisters or peeling
    - Third - Freezing with death to tissues and possibly of the deeper tissues
- Hypothermia
  - Hypothermia involves the lowering of the body's core temperature. The symptoms include uncontrolled shivering fits, sense of cold, slow heartbeat, vague or slow speech, glassy stare, apathy, memory lapses, incoherence, drowsiness, cool skin, slow irregular breathing, sometimes irregular exhaustion, and fatigue after rest. Pain in extremities can be the first warning of overexposure.
- Immersion Foot
  - This condition occurs when the feet have been wet, but not freezing cold, for days or weeks. The primary injury is to the nerve and muscle tissue. Symptoms are numbness, swelling, or even superficial gangrene.
- Trenchfoot ("Wet Cold Disease")
  - Trenchfoot results from exposure to moisture at or near the freezing point for one to several days. As with immersion foot, symptoms include swelling and tissue damage

Cold stress response includes the following:

- Call for medical help in accordance with Section 13 of this PSHEP
- Frostbite
  - Never rub the affected area. Rubbing may cause further damage to soft tissue.
  - Warm the area gradually by soaking it water. Start with cold water wand warm it about every 5 minutes by adding water that is 5°F warmer. Do not immerse the affected part in water that is more than 105°F. If a thermometer is not available, test the water temperature with your hand. If the water temperature is uncomfortable, it is too hot.
  - Keep the affected area under water until it looks red and feels warm.
  - Loosely bandage the area with dry, sterile dressing. If fingers and toes are frostbitten, place cotton or gauze between them before the loose bandage.
  - Do not break blisters.
  - Get professional help immediately
- Hypothermia
  - If an employee becomes fatigued while working, remove him to a warm environment and allow him to rest. As exhaustion approaches, the body experiences rapid loss of heat and the cooling process begins.
  - Remove any wet clothing and dry the victim.
  - Warm the body gradually by wrapping the victim in blankets or putting on dry clothing and moving the individual to a warmer place. Do not warm the body quickly by immersing the person in hot water. Rapid warming can cause dangerous heart problems. If available, apply heating pads or other heating source to the body. Keep a protective barrier, such as towel, blanket, or clothing between heat source and victim to avoid burning the victim.
  - If the victim is alert, give him warm liquid to drink. Never give liquids to an individual who is unconscious or semiconscious.
  - Handle the victim gently.

12.0 MEDICAL MONITORING

In accordance with corporate requirements the Project SH&E Manager (or the GBU SH&E Director) has established and implemented the following medical requirements for the project:

- Personnel that will be exposed to noise at levels greater than 85 decibels over an 8-hour time period require annual training and audiograms.
- Personnel that will have a theoretical potential exposure to contaminants above a PEL based on known soil or water analytical results, or when there is known contamination with no exposure data are required to have annual training, medical clearance and a fit test in order to wear a respirator.
- Medical monitoring is not anticipated on this Program.

Melissa Layfield, Program SH&E Manager, (732) 956-8813 administers the medical monitoring program. Records of medical clearance reports for Parsons employees are maintained by Talent Management. If a Parsons employee has lost his or her personal medical evaluation result, the Parsons employee must contact a Talent Management representative directly for instructions for receiving an additional copy. Records of medical clearance reports for subcontractor employees are maintained by the subcontractor.

13.0 EMERGENCIES AND EMERGENCY MANAGEMENT

13.1 EMERGENCY MANAGEMENT

The PSHEP includes a Notification List of emergency telephone numbers and maps showing the locations of both a nearby emergency facility and a non-emergency clinic for each site in the portfolio. This information will be provided in each site-specific's Dash Card.

To report any emergency by phone, dial 911, and be prepared to describe the emergency and its location.

If the incident that occurred is serious/life threatening or requires emergency response, first summon medical attention before contacting the PM and your GBU Safety Director, filing the IndustrySafe Online Incident Report, (https://project1.parsons.com/Safety/login.htm) or involving WorkCare. **Never attempt to transport a seriously injured person to the emergency room yourself**.

If an injured employee requires medical care for a work-related injury/illness, the Order for Treatment of Work-Related Injury or Illness MUST be sent with the injured worker and/or faxed to the occupational medicine clinic at the time of the initial evaluation. A copy in Appendix H and the link to the document on ParShare: Order for Treatment of Work-Related Injury or Illness.

WorkCare's Incident Intervention is available 24 hours a day, 7 days a week (24/7), and 365 days per year.

WorkCare contact number is 1-888-449-7787.

Be prepared to provide the following:

- Injured employee's name
- Injured employee's contact number
- Injured employee's location (at a minimum include the city and state)
- Employee ID number
- Employee's GBU
- Employee's project or office location
- Functional manager's name

If the WorkCare physician or nurse determines that an employee should be evaluated by a local physician, then an occupational clinic will be used whenever possible (i.e. during normal business hours). A hospital must also be identified to provide treatment during all hours of operations. Locations and driving directions to hospitals and non-emergency clinics are included on each site-specific DASH Card. Hospitals and occupational clinics must also be approved by Parsons, whenever possible.

Each Team member shall be familiar with the kinds of alarms on each project site and know how to effectively respond when an alarm sounds or when an emergency order is given. In addition, project workers shall be familiar with, and participate in, worker accountability protocols. Project-specific emergency response roles and responsibilities, and worker accountability protocols are discussed during the morning safety meeting.

Site specific emergency action plans should be discussed with the field crew and the DASH Card readily available.

13.2 INCIDENT REPORTING

An incident that triggers Parsons' incident reporting, investigation, and management process is any of the following.

- An injury of any significance is sustained by anyone on a Parsons-controlled or Parsons-managed worksite.

- An injury of any significance is sustained by any Parsons employee while the employee is in a travel status in support of Parsons business.
- An illness of any significance is sustained by anyone and manifests its signs or symptoms on a Parsons-controlled or Parsons-managed worksite.
- An illness of any significance is sustained by any Parsons employee and manifests its signs or symptoms while the employee is in a travel status in support of Parsons business.
- An injury or illness of any significance is sustained by anyone and is related to Parsons-controlled or Parsons-managed work activities.
- An unplanned, unauthorized, or non-permitted release of a hazardous substance or other environmentally significant substance occurs on a Parsons-controlled or Parsons-managed worksite, regardless of whether the release meets any threshold for regulatory reporting.
- A hazardous substance release on a Parsons-controlled or Parsons-managed worksite exceeds an environmental permit requirement or a regulatory threshold (other than the original release).
- An unplanned release of a hazardous substance or other environmentally significant substance occurs anywhere and affects Parsons-controlled or Parsons-managed work activities.
- An unplanned security or law enforcement event of any significance occurs on a Parsons-controlled or Parsons-managed worksite.
- An unplanned security or law enforcement event occurs that directly affects a Parsons employee while the employee is in a travel status in support of Parsons business.
- An unplanned event involving property damage occurs on a Parsons-controlled or Parsons-managed worksite.
- A motor vehicle-related event of any significance occurs involving vehicle or facility damage on a Parsons-controlled or Parsons-managed worksite, or in support of Parsons work.
- A motor vehicle-related event of any significance occurs involving vehicle or facility damage and involving a Parsons employee, while the Parsons employee is in a travel status in support of Parsons business.
- An unplanned event occurs on a Parsons-controlled or Parsons-managed worksite that could have caused an injury, an illness, environmental damage, or property damage, but did not because of the intervention of random or fortunate circumstances and conditions. These types of incidents also are called near misses, near hits, and close calls.

When a person detects an incident, the person shall immediately implement the following incident reporting process. See also the Incident Notification numbers on the DASH Card. Continue calling until those listed until someone answers the phone.

Step 1: Does the person perceive that the incident is an emergency?

- Yes: Stop Work, summon the appropriate emergency services, activate an alarm, or direct, by name, a nearby person to summon emergency assistance. Render first aid or other emergency assistance, as appropriate. Follow the site-specific emergency action plan to respond to the emergency. Follow the instructions of qualified emergency responders. Proceed to Step 2.
- No: Proceed to Step 2.

Step 2: Report the incident to the onsite Safety Officer (if applicable).

Step 3: Report the incident to the Parsons site Project Manager, or Site Safety Officer.

Step 4: Report the incident to Melissa Layfield 732-956-8813

Step 5: Report the incident to the Client Contact with approval from the PM

Step 6: Does the incident involve a work-related injury or illness?

- Yes: Did a Parsons employee sustain the injury or illness?

- Yes: The affected employee, supervisor, or project SH&E representative shall describe what shall be done. Call WorkCare at 888-449-7787 when first aid beyond simple or obvious self-care may be needed. For example, WorkCare shall be called for work-related muscle strains, sprains, possible fractures, lacerations or punctures, head injuries, eye injuries, joint injuries, or concerns related to ill health. Proceed to Step 7.
- No: Proceed to Step 7.

Step 7: Cooperate with any related investigations or reviews.

The Project Manager (or delegate) shall make an initial report of the incident to the GBU SH&E Director (or delegate) and to other members of the Parsons leadership team. Further investigation may be necessary.

For significant work-related injuries, illnesses, environmental incidents, security incidents, or property damage incidents, the PM (or delegate) shall make the above initial incident report by telephone and immediately. This immediate initial incident report is essential as Parsons may have to report the significant incident to one or more regulatory authorities within a few hours of the occurrence of the incident. Examples of significant incidents are those that involve:

- One or more fatalities;
- One or more injuries or illnesses requiring a worker to be treated in an emergency room or requiring in-patient hospitalization;
- An injury to a visitor or member of the public;
- An event that may present adverse media press to Parsons or the project;
- A release of a substance requiring a report to a governmental regulator;
- A criminal injury;
- A law enforcement arrest; or
- Property loss or damage exceeding an initial estimate of $50,000.

After the immediate notification by telephone (for significant incidents), or after determining that an immediate report is unnecessary (for all other incidents), the PM (or delegate) shall create and submit the initial report of the incident in IndustrySafe within 4 hours of the occurrence of the incident, or as soon as practical.

All project team members, including those directly affected by the incident, shall cooperate fully with any related incident investigations and management system process reviews.

13.3 INCIDENT INVESTIGATION

The Project Manager shall ensure that significant incidents (including significant near misses) are formally investigated. Incident investigations seek facts, not fault. The result of a properly conducted incident investigation is thoughtful identification of root causes of the incident and effective corrective actions and recommendations to prevent similar incidents from recurring. Incident summaries and any documents associated with incident investigations shall be submitted and retained within the IndustrySafe record associated with the incident.

The investigation process starts as soon as the initial report of the investigation is submitted. The Project Manager (or delegate) shall lead the investigation and shall seek assistance from the project SH&E representative or GBU SH&E Director (or delegate) for subject matter expertise and investigation support. Depending on the incident's complexity and consequences (or potential consequences), the GBU SH&E Director may commission a corporate investigation team to work collaboratively with the Project Manager's investigation process. A formal incident investigation report with corrective actions and accountability assignments shall be distributed to the appropriate members of the project team and Parsons leadership team and submitted in IndustrySafe as a part of the IndustrySafe record of the incident.

After the investigation report is submitted, the Project Manager shall ensure that the project team is aware of any findings, lessons learned, and the status of the corrective actions identified in the incident investigation report. In addition, the Project Manager shall prepare for an Executive Incident Review to formally involve the Parsons executive leadership team.

13.4 INCIDENT MANAGEMENT

For an incident involving a Parsons employee who sustained a work-related injury or illness, the Project Manager shall designate a project team member or a Parsons workers' compensation specialist (Donna Miller; donna.miller@parsons.com; (661) 904-0978) to communicate with the affected worker to collaborate with his or her care and treatment and to help ensure that the medical providers understand the employee's job roles and opportunities for the employee to engage in alternative work. Parsons' objective is to ensure our employees receive the right care as soon as possible and are able to return to work with maximum medical improvement. The Project Manager shall make an effort to communicate with the affected employee as soon as practical to ensure the employee knows Parsons and the project team are concerned with the employee's health and welfare.

If care at a clinic or hospital for an injured Parsons employee is required, the Order for Treatment forms and are available in Appendix H and from Donna Miller and should be provided directly to the care provider, as related to treatment and workers' compensation billing.

If an injured or ill employee is out of work, is restricted from his or her usual work-related activities, or is transferred to an alternative work role, the Project Manager (or delegate) shall routinely communicate with the affected employee, the designated Parsons workers' compensation specialist, and the project SH&E representative to see how the employee is progressing, to ensure the employee knows Parsons and the project team remain concerned with the employee's continuing health and welfare, and to receive an update on the employee's return-to-work status. The Project Manager (or delegate) shall then update the employee's return-to-work status (and any other details) within the IndustrySafe record associated with the incident.

The Project Manager shall require subcontractors on the project team to submit routine status reports related to their workers who have sustained work-related injuries or illnesses while performing Parsons work on Parsons-controlled or Parsons-managed worksites. These status reports, at a minimum, shall describe the current condition of the injured or ill worker (until the worker has reached maximum medical improvement) and the worker's return-to-work status. The Project Manager (or delegate) shall then update the worker's return-to-work status (and any other details) within the IndustrySafe record associated with the incident.

13.5 WORKERS' COMPENSATION PROGRAM

This program does NOT participate in an Owner's Controlled Insurance Program (OCIP) or project-specific insurance program. The workers' compensation policy covering Parsons employees on this program is as follows:

Insurer: New Hampshire Insurance Co
Carrier: AIG
Policy effective date: 1/1/2021 – 1/1/2022
WC policy #: WC012-32-6658
P.O. Box 25908
Shawnee Mission, KS 66225
1.877.802.5246

The Corporate Risk Management Department establishes the workers' compensation carrier. If a workers' compensation loss occurs, the Corporate Workers' Compensation Analyst handles all communication with the workers' compensation carrier.

Donna Miller (donna.miller@parsons.com; (661) 904-0978 is the Parsons point of contact for this project for all workers' compensation matters. When an employee is injured or made ill as a result of work-related activities, it is essential that we abide by local workers' compensation laws and regulations.

14.0 INSPECTIONS, SELF-ASSESSMENTS, AND AUDITS

The scope of the project's inspection, self-assessment, and audit protocols includes all site and facility locations controlled by the project, including sites and facilities not typically occupied, such as material and equipment storage areas, as-needed fabrication areas, and parking areas. In addition, these protocols include the physical site, grounds, and outdoor environmental infrastructure controlled by the project. Contractor-controlled worksites and operations are included.

14.1 PROGRAM SAFETY COMMITTEE

A program safety committee that includes representation from all project stakeholders has been formed. Monthly safety committee meetings will take place in accordance with NYSDEC requirements.

Charter of a Safety Committee: The project safety committee represents the mutual interests of all project participants in completing the work with zero injuries. The committee meets quarterly to consider incentive programs, recent near-miss incidents or injuries, potential unsafe conditions, training programs, safety awareness, audit results, and other safety related issues. The committee advises the Program Manager, who retains sole decision-making authority.

The committee consists of equal numbers of Parsons and subcontractors personnel, professional/ management and craft/trade personnel, and/or exempt and non-exempt personnel.

Safety committee members are as follows:

- Thomas Drachenberg (Parsons Program Manager)
- Melissa Layfield (Parsons Program Safety Manager and Chairperson of Safety Committee)
- Sara Weishaupt (Parsons Project Manager)
- Edward Ashton (Parsons Project Manager)
- Casey Fetsko (Parsons Geologist)
- Thomas Horn (Parsons Geologist)
- Matthew Vetter (Parsons Project Manager)
- William Long (Parsons Project Manager)
- Additional members as needed

The chairperson schedules quarterly meetings develops the agenda and distributes meeting minutes to committee members. Workers may submit suggestions and topics for discussion to the chairperson at any time.

14.2 SH&E INSPECTIONS

An SH&E inspection is an in-person, on-site verification (by direct observation) that work is being performed, and equipment and infrastructure is being used and maintained, in accordance with the risk register, and in accordance with associated SH&E policies, procedures, regulations, laws, and best practices.

The findings of SH&E inspections and associated non-conformances arising out of the inspections shall be documented, and any non-conformances shall be resolved as soon as practical.

14.3 ROUTINE SH&E INSPECTIONS

Periodic (weekly) SH&E inspections should be conducted by the Site Safety Officer (SSO) using the behavior-based safety (BBS) observation form provided in Appendix F .

14.4 FOCUSED SH&E INSPECTIONS

Field staff consist of fewer than 5 people and are typically not required to be onsite for more than five continuous days, therefore focused SH&E inspections will not be conducted.

14.5 SH&E COMPLIANCE INSPECTION

SH&E inspections may be conducted as required by the activities and duration of time on site. The Program Health and Safety Manager or designee will conduct compliance inspections and audits.

14.6 SH&E AUDITS

SH&E audit may be conducted as required by the activities and duration of time on site. The Program Health and Safety Manager or designee will conduct compliance inspections and audits.

14.7 EMPLOYEE-BASED SAFETY/PEER-BASED OBSERVATIONS

The Parsons BBS program is applicable to all staff. A behavioral safety process identifies behaviors people should use, checks what behaviors are actually in use, and addresses the gap between these two in a positive way. The effectiveness of the process depends on cooperative participation of all members of the workforce. See the behavior-based safety defined practice for additional details.

Behavior based safety processes can take many forms but typically consist of the following essential elements:

- Identification and explicit definition of target safe behaviors.
- Observation and recording of those behaviors.
- Reinforcement and/or feedback based on the recorded behavioral data.

Parsons personnel shall use observation tools to conduct and record behavior observations. Copies of Observation Engagement Forms (OEF) are included in Appendix F.

Subcontractors who provide services to Parsons are also required to participate in the behavior-based safety program. Subcontractors may use standards, practices and procedures comprising their own Health, Safety, Security and Environment (HSSE) management systems to meet the requirements in this practice if they are essentially equivalent to the Parsons BBS program. Parsons shall have the right to periodically audit subcontractors' HSSE Management Systems and/or field work to assure that such systems meet the requirements of Parsons Management System and are being followed. Subcontractors shall be expected to cooperate with all such audits and to promptly respond to any issues identified and correct any deficiencies.

14.8 SH&E PERFORMANCE MEASUREMENT

No more than three business days after the close of the monthly reporting period, the Project Manager (or delegate) shall report the following information through the Program Safety Manager of designee.

Leading Indicators of SH&E Performance:

- Number of focused SH&E inspections performed and documented.
- Number of SH&E compliance inspections performed and documented.
- Number of near misses reported and investigated.
- Number of SH&E-related rewards and recognitions dispensed among project stakeholders.
- Number of subcontractors not used due to SH&E disqualification.

Trailing (Lagging) Indicators of SH&E Performance (Parsons Employees):

- Number of hours worked on the project by Parsons employees.
- Number of Parsons employee injuries or illnesses leading to lost time.

- Number of Parsons employee injuries or illnesses leading to restricted duty or transfer.
- Total number of all Parsons employee recordable injuries or illnesses.

15.0 MEETINGS

Risk communication and planning meetings routinely shall take place on the project. This section of the PSHEP describes these meetings, their structure, their participants, their expected frequency, and whether or not they are to be documented. If these meetings are to be documented, then this section of the PSHEP also describes what is documented and where these documented meeting records are maintained.

Other meetings beyond these listed may be needed to help ensure that project risks are communicated, and risk controls are planned adequately.

- Project Kickoff and Premobilization Meetings (PM, staff, line supervisors, stakeholders)
  - Establishes initial site contacts, verifies site infrastructure availability, orders initial supplies, tools, and equipment, reinforces work initiation and SH&E expectations among stakeholders.
  - Confirms that necessary work instructions, activity hazard analyses, SH&E programs, and SH&E training and qualifications have been completed and have been communicated to the affected personnel.
  - Unresolved PSHEP implementation tasks shall be identified and a path to their resolution shall be agreed to.
  - These meetings shall be formally documented, with names of attendees, the agenda, meeting minutes, and actions items coming from the meeting. Action items shall be tracked to resolution.
  - The Project SH&E Manager maintains the meeting documentation on file.

- Daily/Pre-task Briefings (field employees)
  - Conducted by field leader and field employees prior to beginning work.
  - provides a scheduled forum to discuss planned daily activities, project risks and mitigations, and the overall HSSE concerns of the project. The purpose of the meeting is to raise the consciousness of the workers before they start work. Important to the process is the affirmation of each and every team member to be mentally and physically fit for duty. All information discussed during the meeting is documented in the Field Authorization Form.
  - Includes the use of an activity hazard analysis, or other job-specific risk assessment and/or permit issuance (as needed).

- Work Pause/ “Take 5” Briefings (field employees)
  - Conducted by field employees when something occurs that was not planned and requires a brief re-assessment of the work to continue.
  - Involves the use of an activity hazard analysis or other job-specific risk assessment process, with modifications applied as necessary to account for the unplanned event.
  - Document these meetings with the Take 5 Card (Exhibit 15.1 and Appendix F). This documentation is maintained with the field notes.
  - Contact the Parsons PM before re-starting work to discuss any work pause or Stop Work event.

- Stop Work Meetings (field employees, PM)
  - Conducted by any employee who notices an unsafe condition, act, or behavior that precludes continuing the work as planned.
  - Involves the use of an activity hazard analysis, or other job-specific risk assessment process, with modifications applied as necessary to account for the unplanned event.
  - May involve a lengthy work stoppage and invoke other reporting requirements to ensure the work is ready to resume.

  - These meetings shall be formally documented, with names of attendees, the agenda, meeting minutes, and actions items coming from the meeting. Action items shall be tracked to resolution.
  - This meeting will be documented, and records maintained in the electronic files.
  - Contact the Parsons PM before re-starting work to discuss any work pause or Stop Work event.

- Toolbox Talks (PM, staff, stakeholders, field employees)
  - Conducted by stakeholders and employees daily.
  - Involves the preparation of any required permits (if necessary)
  - See Tailgate Meeting form in Appendix F.

- All Hands Meetings (all employees and stakeholders)
  - Involves everyone on the project. The PM typically leads these meetings to encourage the project team, to recognize and reward outstanding employees and stakeholders, and to ensure the Parsons SH&E core value is expressed.
  - These meetings shall be formally documented, with names of attendees, the agenda, meeting minutes, and actions items coming from the meeting. Action items shall be tracked to resolution.
  - The project manager will maintain the documentation for these meetings.

- Other Meetings
- None expected.

The project manager or designee will maintain the documentation for these meetings.

Exhibit 15.1 – Take 5 Card

PARSONS	Safety – The first thing you do!

- **Date:___**
- **Project/Task:___**
- **Your Name:____**
- **Before you begin any new task pause for 30 seconds and ask yourself the following questions. Take corrective actions as necessary prior to beginning work.**
- ☐ Do I know exactly what I am doing?
- ☐ Have I reviewed the AHA for this task?
- ☐ Do I have all the right people involved?
- ☐ Is there any potential that I or my coworkers could get hurt?
- ☐ Are there any questions I should be asking fellow employees?
- ☐ Should I talk to my supervisor?
- ☐ Have I read the Work Plan and fully understand the procedures relating to this job?
- ☐ Am I using the proper tools?
- ☐ Do I have the proper PPE?
- ☐ Will I be working as safely as I know how?
- ☐ Do I see anything that just doesn't look quite right?
- ☐ Am I in a hurry? Would I be safer if I slowed down?
- **Each of these questions should be answered to your full satisfaction before you proceed with the work. Remember, no job is so important that you must jeopardize your safety.**
- **Job Hazards? (List direct hazard of job duties)**
- 1. Hazards: ______
- Mitigation: ______
- 2. Hazards: ______
- Mitigation: ______
- 3. Hazards: ______

- Mitigation: ______

Work Area	Yes	No
Work Area Clean	☐	☐
Permits Attained	☐	☐
Standard PPE (Hard hat, vest, glasses, gloves, safety boots)	☐	☐
Additional PPE needed:		

Briefly review hazards and mitigations again after lunch.

ParShare file: Take 5 Card

16.0 COMMUNICATION, CONSULTATION, AND AWARENESS CAMPAIGNS

The project has an awareness program consistent with the Parsons SH&E awareness campaign and its various elements (e.g., signs, posters, banners, and focus briefings). This program promotes employee awareness of SH&E goals and daily risks, hazards, and exposures in the field. In addition to topics selected by Corporate Safety each month, the project will supplement the awareness program with information specifically applicable to the scope of work.

Safety awareness is covered in daily safety meetings.

A stakeholder PSHEP alignment meeting should be held before beginning any field work. The following representatives should attend the meeting:

- Parsons and Subcontractor Project Manager
- Parsons and Subcontractor Field Team Leader

Parsons should obtain stakeholders concurrence with the approach. The meeting should include a review of stakeholder roles and responsibilities and elements of control appropriate to project risks.

17.0 REWARDS AND RECOGNITION

Each Project should develop a “Rewards and Recognition” program to foster continuous improvement in SH&E performance.

17.1 PARSONS DISTINGUISHED RECOGNITION AND INCENTIVE (DRIVE) PROGRAM

The Parsons Distinguished Recognition and Incentive (DRIVE) Program celebrates employees who go above and beyond in their work. With nine different award levels, the program is designed to reward employees who have made exceptional contributions to a program or project, or who have provided outstanding support to their teams, our clients, or our company as a whole. It is important to recognize achievements or accomplishments that contribute to the overall SH&E objectives of the company, focusing on leading indicators rather than lagging indicators.

Appreciating our employees as Parsons’ most valuable asset, we hope everyone will join us in celebrating the “DRIVERS” who are steering Parsons to continued success.

Utilize the following link to nominate an employee for a DRIVE award.

- Parsons DRIVE Program

17.2 EXAMPLES OF LEADING INDICATORS

Examples of leading indicators or actions to reward and recognize are as follows:

- Participating in or leading a safety meeting.
- Providing suggestions for improving workplace SH&E.
- Creating or revising an AHA
- Reporting a Stop Work, Hazard ID or Near-Miss.

Celebrations of achievements at a project or office level are important. Project luncheons at milestone achievements are encouraged and are the appropriate place to recognize the collective achievements of working without incident. In addition, spot awards can be given by the Parsons Safety or Management Team. A spot award is given when an individual working on the site (Parsons employee or contractor) is observed going above and beyond expected safety behavior or who demonstrates outstanding safety leadership (i.e., intervention of an unsafe act or behavior). The names of individuals who are given spot awards will be recorded and given public recognition. Annual Awards will be given at the discretion of management to the team in celebration of achievements and milestones.

18.0 ENFORCEMENT AND DISCIPLINE

The Project Manager has established a fair and consistent project policy for the disciplinary process related to employees and project stakeholders who are unable to abide by the project's SH&E expectations. In general, Parsons employees and contractor workers who intentionally create or contribute to situations that are immediately dangerous to life, health, the environment, or the security of the project are subject to immediate termination. The Project Manager, and the project's assigned Talent Management professionals, shall ensure that enforcement and discipline matters are handled fairly and fully consistently with applicable contracts, collective bargaining agreements, local, regional, and national laws and regulations, and the Parsons SH&E core value.

Continual improvement is an essential aspect of Parsons SH&E core value. The Project Manager, supervisors, and project stakeholders shall identify and immediately address unacceptable actions and behaviors. All members of the project team shall be on the lookout continually for any conditions, actions, or behaviors that increases the risk of injury, illness, property damage, or environmental insult. The first step to addressing at-risk conditions, actions, and behaviors is through personal communication, coaching, or mentoring.

Parsons and its subcontractors enforce all applicable SH&E requirements of regional, federal, municipal, state, local, and all other regulations; and where applicable OSHA 1910 and 1926 and NY City where applicable. Subcontractors must also comply with and enforce Parsons site requirements.

Parsons and its subcontractors must have written progressive disciplinary systems available for review in their Talent Management departments.

18.1 NOTICE OF VIOLATION OF SAFETY AND HEALTH REGULATIONS

The project has a formal Notice of Subcontractor Violation of SH&E Regulations Program to ensure that violations are issued as the result of an IDLH situation, respiratory airborne hazards (RDLH), and/or when the subcontractor repeatedly fails to comply with SH&E requirements.

19.0 SUBSTANCE ABUSE IDENTIFICATION AND TESTING

Parsons is committed to providing a drug-free and healthful work environment. In collaboration with the Talent Management professionals assigned to the project, the Project Manager has established a fair and reliable substance abuse and identification and testing program.

Without exception, employees, contractor workers, and other project stakeholders shall be fit for duty while conducting work on behalf of Parsons, while on Parsons worksites, and while driving.

For this project, the client does not require specific drug and/or alcohol testing. All employees will comply with Parsons substance abuse programs.

The Parsons vehicle policy requires that all drivers involved in a Fleet, Lease, or Long-Term rental vehicle accident are to undergo drug screening within 4 hours of a motor vehicle incident. The only exception to the drug testing requirement will be accidents that occur when the Parsons' Fleet driver is not in the vehicle (i.e., vehicles damaged while parked).

If you are a U.S. employee involved in an accident while operating a Parsons owned or leased vehicle, you are required to complete alcohol and drug testing. You or your manager will need to schedule testing with I3screen, our Parsons vendor.

Employee actions:

- If you are involved in an accident while operating a Parsons owned or leased vehicle, immediately contact your manager.
- You will be required to take a drug and alcohol test within 4 hours of the accident.
- You or your manager will need to schedule the test.

The employee or manager is required to schedule post-accident testing following the following process:

1. Immediately contact I3screen, our drug and alcohol testing vendor.
2. If the accident occurs during business hours - 6am PST to 5pm PST - Call 1 (877) 585-7366 and select option 4.
    a. If the accident occurs after business hours, including weekends and holidays, call 1 (866) 457-4009.
3. Provide your company name and Quest Account Number Non-Dot: 10534253.
4. Provide Reason for test: Reasonable Suspicion or Post Accident.
5. Confirm Services needed: 10 - Panel Drug and Breath Alcohol Test (BAT).
6. Provide Employee information:
    a. First and last name
    b. Social Security Number
    c. Employee phone number
    d. Address where accident occurred
7. I3screen team will identify a site that can perform the requested service > The team will provide you with information about the collection site.
    a. If calling after business hours, Quest 24/7 Team will locate a site. If a site is not available a mobile collector will be dispatched to employee's location, upon client approval.
8. Have a chain of custody form available as it may be required for testing. Form can be found in the glove department of the vehicle.
9. Send drug testing receipts to People Central. Log a ticket in this article > Provide the following information in the
    a. Description field and upload testing receipts:
    b. Employee name
    c. Cell phone number
    d. Current zip code/location of accident
    e. Date of accident
10. People Central will inform you of the test results.

NOTE: The employee MUST be driven to the testing facility by either their manager or another employee or call a taxi/Lyft/Uber. Follow Parsons Risk Management Accident Reporting procedures.

20.0 COVID-19 PROTOCOLS AND PROCEDURES

Procedures and requirements intended to prevent the spread of COVID-19 while performing field activities are presented in Appendix I

APPENDIX A

SUBCONTRACTOR SAFETY, HEALTH, AND ENVIRONMENT PLAN (SSHEP) TEMPLATE

NOTE: Italic text in bright red font provides directions for completing the SSHEP and should be deleted after providing the appropriate information.

PREFACE TO CONTRACTOR FOR PREPARING THE SSHEP

This template gives general directions on how to prepare your site-specific safety, health, and environmental plan (SSHEP). It is as an aid for contractors; contractors are solely responsible for the content of their SSHEPs. This template was written for a broad spectrum of contractors and each contractor shall modify it to address the requirements of the particular Parsons' project on which it is working. The SSHEP shall contain the information in the following table.

Information Required in an SSHEP

Section	Title	Section	Title
1	Project Owner, Project Name, and Contractor's Safety, Health, and Environmental Policy Statement	11	Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions
2	Scope of Work Evaluation	12	Employee Participation and Consultation
3	Responsibility and Identification of Key Personnel	13	Emergency Action Plan
4	Overall Assessment of SH&E Hazards, Exposures, and Risks	14	Site-specific Medical Emergency Plan
5	Relevant SH&E Compliance Programs, Associated Compliance Information, and Personnel Responsibility Assignments	15	Incident Reporting, Investigation, and Corrective Action Processes
6	SH&E Compliance Training Matrix and Training / Education Processes	16	Work Site Inspection and Program Audit Processes
7	Site-specific Worker Orientation Program	17	Progressive Disciplinary Program
8	Identification of Competent / Qualified Personnel	18	Recordkeeping / Document Retention Processes
9	Hazard Identification, Notification, and Correction Process	19	Other (as defined by Contractor or Parsons)
10	Specific Hazard and Risk Control Measures (e.g., Activity Hazard Analyses, Operational Risk Management Processes)	20	Other (as defined by Contractor or Parsons)

The following checklist will be used by the project manager or designee to determine if the SSHEP is acceptable to Parsons.

Date: ______________________ **Project/Location:** ______________________

Contractor Name: ______________________ **Parsons SH&E Representative:** ______________________

The information provided here is based on a review of the contractor site-specific safety, health, and environmental plan (SSHEP). Areas identified as incomplete shall be revised based on the standards in the contract specifications and the project safety, health, and environmental plan (PSHEP). Contractors shall resubmit revised sections of the SSHEP to the project manager within 1 week of receiving this review documentation.

Section	Complete	Incomplete	Section	Complete	Incomplete
Statement of SH&E Policy	☐	☐	Specific Activity Hazard Analyses (AHAs) and Operational Risk Assessments	☐	☐
Scope of Work Evaluation	☐	☐	Adequate Hazard / Risk Controls	☐	☐
Key Line Personnel Identified	☐	☐	2-Week Look-ahead Planning	☐	☐
Overall Assessment of Hazards and Risks	☐	☐	Employee Participation and Consultation	☐	☐
Relevant SH&E Compliance Programs (Hazard Communication, PPE, HAZWOPER, Hazardous Energy Control, Fall Protection, Confined Space Entry, RCRA, etc.)	☐	☐	Emergency Action Plan	☐	☐
SH&E Compliance Program Responsibilities Assigned	☐	☐	Site-specific Medical Emergency Plan	☐	☐
Compliance Training and Education Programs	☐	☐	Incident Reporting, Investigation, and Corrective Action Processes	☐	☐
Site-specific Worker Orientation Program	☐	☐	Work Site Inspection and Program Audit Processes	☐	☐
Competent and Qualified Personnel Identified	☐	☐	Progressive Disciplinary Program	☐	☐
Hazard Identification, Notification, and Correction Process	☐	☐	Recordkeeping / Document Retention Processes	☐	☐

Additional Comments / Other SSHEP Sections or Information Required

____

____

____

____

Reviewed by:

Name **Title**

______________________ ______________________ ______________________

Proper use of this model plan requires your firm's project manager to carefully review the requirements for each SSHEP element. Complete the appropriate blank spaces and check those items that are applicable to your workplace. The SSHEP must be implemented by the contractor's project manager for it to be effective.

Every Parsons contractor shall establish, implement, and maintain a copy of a written SSHEP at each work site. The purpose of the SSHEP is to help ensure that the contractor is willing and able to support the Parsons goal of zero SH&E incidents.

Parsons may conditionally approve the SSHEP with elements that are "to be determined", especially elements that are not relevant until a future phase of work. The contractor along with the Parsons project manager shall maintain and update the SSHEP as a living document that reflects changes in personnel, hazards, or risk management strategies as the project progresses.

***Note:** Delete the previous text and start the SSHEP here.*

Contractor Company Name Here

Common Project Name Here

Contractor Site-specific Safety, Health, and Environmental Plan (SSHEP)

SSHEP Approval Date Here

Table of Contents

Note: *The above Table of Contents is built around the existing template headings. If you are using Microsoft Word, after completing the SSHEP using this template, press "F9" and the above Table of Contents will automatically conform to the structure of your document.*

Contractor's Safety, Health, and Environmental Policy Statement

This plan contains the minimum requirements for an effective contractor site-specific safety, health, and environmental Plan (SSHEP) by *contractor company name here* for the *common project name here*. This SSHEP shall be implemented and maintained by *contractor company name here*. This SSHEP applies to all persons of our company.

The leadership team is responsible for ensuring that all SH&E policies and procedures are clearly communicated and understood by all employees. Managers and supervisors are expected to enforce the rules fairly and uniformly.

All employees are responsible for using safe work practices, following all directives, policies and procedures, and assisting in maintaining a safe work environment.

Our system of ensuring that all workers comply with the rules and maintain a safe work environment includes the following.

- Informing workers of the provisions of this SSHEP
- Evaluating the SH&E performance of all workers
- Recognizing employees who consistently perform SH&E work practices very well
- Providing training to workers whose SH&E performance is deficient
- Disciplining workers for failure to comply with safe, healthful, and environmentally responsible work practices

The contractor shall add additional bullets, as appropriate.

The contractor shall attach its formal corporate SH&E policy statement(s).

Scope of Work Evaluation

The contractor shall list the work activities and anticipated schedule.

Responsibilities and Identification of Key Personnel

These personnel have authority and responsibility to implement this program.

The contractor shall complete this table and augment it as needed.

<table>
<tr><td>Contractor:</td><td colspan="2"></td></tr>
<tr><td>Address:</td><td colspan="2"></td></tr>
<tr><td>Telephone</td><td>Fax</td><td>Email</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td colspan="2">Company Executive responsible for project</td><td>Contact No.</td></tr>
<tr><td colspan="2"></td><td>Direct Line:
Cell Phone:
Email:</td></tr>
<tr><td colspan="2">Manager/Superintendent:</td><td>Contact No.</td></tr>
<tr><td colspan="2"></td><td>Direct Line:
Cell Phone:
Email:</td></tr>
<tr><td colspan="2">Safety Representative/Manager:</td><td>Contact No.</td></tr>
<tr><td colspan="2"></td><td>Direct Line:
Cell Phone:
Email:</td></tr>
<tr><td colspan="2">Key Foreperson or Forepersons:</td><td>Contact No.</td></tr>
<tr><td colspan="2"></td><td>Direct Line:
Cell Phone:
Email:</td></tr>
<tr><td colspan="2">Client Project Management Point of Contact:</td><td>Contact No.</td></tr>
<tr><td colspan="2"></td><td>Direct Line:
Cell Phone:
Email:</td></tr>
</table>

Project Site Location	**General Onsite Contact No.**
	Direct Line: Cell Phone: Email:

All managers and supervisors are responsible for implementing and maintaining the SSHEP in their work areas and for answering worker questions about the SSHEP. Managers and supervisors shall make a copy of this SSHEP available to all workers.

Overall Assessment of SH&E Hazards, Exposures, and Risks

The contractor shall list the SH&E hazards, exposures, or risks associated with the scope of work.

Activities shall be evaluated and activity hazards analyses (AHAs) or other effective risk management process shall be developed. AHAs and other risk management processes are described in Section 10 and included in this SSHEP.

SH&E Compliance Programs

Contractor company name here shall comply with relevant SH&E laws and regulations. Written compliance programs shall be implemented on our job sites and coordinated with other site contractors, our lower-tier subcontractors, and with Parsons, as appropriate. Our employees shall be aware of these programs, receive adequate training, and perform their work consistent with these compliance programs.

The contractor shall list all relevant (and required) site-specific SH&E compliance programs.

The contractor shall identify the name and contact information for the person who is programmatically responsible for each SH&E compliance program.

The contractor shall attach the written compliance programs and all related information (e.g., safety data sheets, chemical inventory, equipment-specific lock-out/tag-out procedures), in a referenced and included appendix.

SH&E Compliance Training Matrix and Training / Education Processes

All workers, including managers and supervisors, shall receive competent and relevant site-specific SH&E training. This training shall include site-specific SH&E compliance training and general site training on SH&E best practices. Our employees shall be properly prepared for conducting their work and shall comply with the relevant SH&E programs and general site-specific SH&E practices.

A written training matrix shall be established and maintained that identifies the workers (by name or by title/role), all of the SH&E-related training they must have, and the frequency for refresher (if needed).

Training shall be provided:

- When the SSHEP is established;
- To all new workers;
- To all workers with new job assignments for which training has not been previously provided;
- When new substances, processes, procedures, or equipment are introduced to the workplace and represent a new hazard, potential exposure, or risk;
- When the employer is made aware of a new or previously unrecognized hazard, exposure, or risk;
- To familiarize supervisors with the SH&E hazards, exposures, or risk to which workers under their immediate direction and control may be exposed; and
- To all workers for hazards, exposures, or risks specific to their job assignment and in compliance with related SH&E compliance programs.

Workplace safety and health practices for all work locations shall include, at a minimum:

- An explanation of the SSHEP, the Parsons Project Safety, Health, and Environmental Plan (PSHEP), the site's emergency action plan and fire prevention plan, and the measures to report unsafe conditions, work practices, injuries, and/or a recognized need for additional instruction;
- The general purpose, availability, use, limitations, and disposal of outerwear and personal protective equipment;
- Locations of sanitation, hand-washing, and drinking water facilities;
- Provisions for medical services and first aid, including emergency procedures;
- Response procedures for environmental spills or releases; and
- Specific instructions to workers on hazards unique to their job assignment to the extent such information is not covered in other training.

The contractor shall attach its site-specific training matrixes here.

Site-specific Worker Orientation Program

All new workers on our jobsite shall receive site-specific orientation training before conducting their work. This training shall consist of SH&E compliance training and general site SH&E practices related to their work.

Employees completing orientation shall acknowledge in writing completing and understanding the site-specific orientation subject matter. Employees who do not understand one or more subjects shall be retrained.

The contractor shall attach the subject matter associated with site orientation.

Identification of Competent / Qualified Persons

The contractor shall list and submit certificate(s) demonstrating the formal competence of company personnel assigned to this contract. The contractor shall complete Contractor Competent Person certification forms for each designated competent or qualified person and submit them to the Parsons project manager prior to site mobilization. Refer to the form on the next page.

Contractor Competent Person Certification (United States)

Definition

A competent person is a formally-designated person having the ability to recognize existing and predictable hazards and has the authority to correct them.

Responsibility

The designated contractor competent person is responsible for recognizing and correcting SH&E risks/hazards. This person has the authority to stop work due to a perceived SH&E concern on the jobsite. This contractor manager and designated competent person are considered field contacts for Parsons projects.

This form shall be completed by each contractor manager and the contractor-designated competent person. ***Where a contractor is responsible for multiple crafts, it will be necessary to maintain additional designated competent persons and forms.*** Each contractor on a Parsons project shall submit this completed form to the Parsons project manager before beginning work on the project and must update it any time the designated competent person changes.

Acknowledgment

I, ______________________________________ representing, ____

Contractor Manager (Printed) **Contractor Company Name (Printed)**

have assigned ____________________________ to be the competent person in the areas indicated and

Contractor Competent Person (Printed)

I acknowledge that this individual has been thoroughly trained, is experienced in hazard recognition, and has the authority to stop work and correct hazards in the event of a potential hazardous or imminent danger situation.

____

Contractor Manager (Signature) **Date**

I acknowledge that I have been thoroughly trained and have the experience to perform the duties as the competent person in the areas marked below, and I understand that I have the responsibility and authority to correct hazards and to stop work in the event of a potential hazardous or imminent danger situation.

____ ______________

Contractor Competent Person (Signature) **Date**

(Check the areas in which the designated competent person is permitted to execute the role of Contractor Competent Person.)

☐	Air Pollution and Emissions	☐	Environmental Assessments	☐	Mechanical Demolition
☐	Asbestos	☐	Excavations and Trenches	☐	Protected Ecological and Cultural Resources
☐	Bolting, Riveting, and Fitting	☐	Fall Protection	☐	Resource Conservation
☐	Buried Items	☐	First Aid and CPR	☐	Respiratory Protection
☐	Concrete, Forms, and Shoring	☐	Hearing Protection	☐	Rigging
☐	Cranes and Derricks	☐	Ladders	☐	Scaffolding
☐	Demolition	☐	Lead	☐	Tunnels and Shafts
☐	Drinking Water	☐	Management of Hazardous Materials and Hazardous Solid Wastes	☐	Underground Construction
☐	Electrical			☐	Wastewater
☐	Emergency Response to Spills and Releases	☐	Marine Work and Diving	☐	Welding and Cutting
		☐	Material and Personnel Hoists		
☐	Other				

Hazard Identification, Notification, and Correction Process

Each employee is the critical leader for preventing injuries, illnesses, and adverse environmental impacts, Achieving SH&E excellence requires a personal commitment. Therefore, each employee is authorized to stop work immediately if a safety, health, or environmental concern exists or if the work is not going according to plan. Once work is stopped, each employee is expected to communicate the work stoppage to the other affected stakeholders and further evaluate the condition and adjust the work plan to resolve the safety, health, or environmental concern before restarting the work.

Each employee shall understand that he or she has the **authority** and the **responsibility** to stop work at any time when he or she notices an unplanned or unexpected issue that he or she believes will adversely affect the project's safety, health, or environmental risk. This concept is consistent Parsons SH&E core value.

There is no circumstance where retribution may be directed toward an employee who conscientiously exercised his or her stop work authority.

When should work be stopped? Here are some examples.

- An unsafe act is observed.
- An unsafe condition is observed in the work area.
- An incident or near miss occurs in the work area.
- There is an emergency.
- Alarms sound.
- There is a change in the planned work conditions.
- There is a change in the planned personnel associated with the work.
- There is a change in the planned in scope of work.
- A change is needed in the work plan.
- One or more personnel associated with the work task appear to be confused or demonstrate that they do not understand one or more parts of the work plan.
- Someone believes that personnel, the environment, facilities, or equipment, is exposed to an unacceptable level of risk.

Unsafe, unhealthful, or environmentally damaging work conditions, practices, or procedures shall be corrected in a timely manner based on the severity of the risk posed.

The contractor may change the words in this section. Parsons expects its contractors to maintain a working environment where all employees feel comfortable identifying hazards and risks, correcting them, and stopping work when a hazard or risk was not adequately controlled.

Specific Hazard and Risk Control Measures

Activities shall be evaluated by workers and other subject matter experts to determine the appropriate hazard and risk controls that shall be implemented when performing the activity. In most cases, formal activity hazard analyses (AHAs) shall be communicated and used; however, some activities may require more sophisticated risk management schemes.

The contractor shall list all relevant (and required) site-specific AHAs and other risk management measures that will be taken to manage the risks associated with the scope of work and the general risks and hazards identified in Section 4.

The contractor shall attach the actual AHAs, job aids, and risk management tools in a referenced and included appendix.

Integration of SH&E Risk Mitigation Planning in 2-Week Look-ahead Submissions

The risk mitigation 2-week look ahead form, below, will be used to plan integrated risk mitigation strategies at weekly progress meetings.

SH&E Risk Mitigation 2-week Look-ahead Form

SH&E Plan for Week Ending:		**Contractor:**	
Project/ Location:		**Meeting Date:**	
Plan Prepared by:		**Dated:**	

Next Two Weeks' Scope of Work:

Identified SH&E Risks/Exposures/Hazards Issues:

Identify Tasks requiring environmental construction permitting (e.g., stormwater permit) or involving other environmental regulatory issues (e.g., generation of new, uncharacterized waste):

Tasks with environmental risk of significant spills or releases:

Control Measures:

Additional Activity Hazards Analysis Required:

Contractors and Subcontractors Mobilizing/Demobilizing:

Audits/Inspections Scheduled:

Competent Person Changes:

Planned Orientation/Training:

Recommendations/Comments/Concerns:

Note: This information shall be incorporated into the meeting minutes.

The contractor may change these words or use another form, as long as the contractor strictly abides by the 2-week look-ahead process.

Employee Participation and Consultation

Open, two-way communication between the leadership team and line employees on SH&E issues is essential to an injury-free, productive, and environmentally sound workplace. The following system provides for the flow of SH&E information.

- Continually maintaining an environment where any worker can report SH&E concerns without any risk of retribution.
- A collaborative approach to resolving worker SH&E concerns, using worker knowledge and experience in developing appropriate risk control measures.
- New worker orientation, including specific orientation to SH&E policies and procedures
- Reviews of the SSHEP and the Parsons PSHEP
- Workplace SH&E training programs
- Regular SH&E meetings
- Posted or distributed SH&E information (awareness program)
- Procedures to anonymously inform SH&E management of workplace hazards, exposures, or risks
- An employee (or labor/management) SH&E committee that: 1) meets regularly and prepares written records, 2) reviews results of periodic scheduled inspections, 3) reviews incident investigations, 4) assesses work risk, 5) reviews reports of hazards, exposures, or adverse environmental conditions, and 6) makes suggestions to management to prevent future incidents.

The contractor may change the words in this section. Parsons expects its contractors to maintain a working environment where all employees feel comfortable identifying hazards and risks, correcting them, and stopping work when a hazard or risk was not adequately controlled.

Emergency Action Plan

The contractor shall attach its site-specific emergency action plan. Be sure it identifies specific assembly areas, describes the employee accountability procedures, and explains emergency communication methods. The emergency action plan also should include information on how employee accountability information is transmitted to Parsons and the name of the contractor employee responsible for maintaining the emergency action plan.

Site-specific Medical Emergency Plan

The contractor shall provide information on how emergency medical services are summoned, how emergency services provider will get to the injured or ill employee, the names and work locations of designated and trained first first-aid/CPR providers, and the process for managing non-emergency injury or illness cases where treatment beyond local first aid is needed.

Incident Reporting, Investigation, and Corrective Action Processes

The contractor shall provide information on how incidents are reported and investigated, and how corrective actions are implemented to prevent recurrence.

The contractor's incident reporting, investigation, and corrective action processes should include all or most of the following.

- *Responding to the scene of the incident as soon as possible*
- *Reporting immediately to the appropriate Parsons point of contact*
- *Interviewing injured workers and witnesses*
- *Examining the incident locations or workplace for factors associated with the incident*
- *Determining the cause of the incident*
- *Taking corrective action to prevent the incident from recurring*
- *Recording the findings and corrective actions taken*
- *Post-incident substance abuse testing*

Parsons expects its contractors to maintain a working environment where all employees feel comfortable reporting injuries and illnesses, without fear of retribution or peer pressure.

Work Site Inspection and Program Audit Process

Site SH&E inspections shall be performed by one or more knowledgeable employees prior to beginning work each day in areas where work will take place during the shift. Designated competent persons shall perform frequent inspections and assessments of the areas and activities under their oversight throughout the day. Deficiencies shall be corrected as soon as possible.

The superintendent or project manager shall perform documented weekly SH&E inspections of all work sites. Deficiencies shall be tracked to closure in a timely manner.

The following SH&E inspections shall be performed. Findings shall be tracked to timely closure.

The contractor shall complete this table for all programmed inspections, including compliance inspections. Rows may be added or deleted.

Competent Person / Inspector	Area of Responsibility	Frequency

The following compliance programs shall be reviewed and audited. Findings shall be tracked to timely closure.

The contractor shall complete this table for all SH&E program compliance reviews and audits. Rows may be added or deleted.

Reviewer / Auditor	Compliance Program	Frequency

Progressive Disciplinary Program

The contractor shall explain or attach its progressive disciplinary program.

Recordkeeping / Document Retention Processes

All records shall be maintained no less than 3 years beyond the end of the contracted work, unless a longer period of retention is required by a regulatory agency.

The contractor shall explain or attach its recordkeeping / document retention program. At a minimum, the contractor's recordkeeping and document retention program shall describe the following.

- *The information recorded for inspection, audit, and incident investigation findings.*
- *How inspection, audit, and incident investigation findings are accessed and preserved, and how corrective actions are tracked to closure, and how closure records are accessed and preserved.*
- *The information contained in SH&E training records.*
- *How training records are accessed and preserved.*
- *The information contained in industrial hygiene and medical monitoring records.*
- *How industrial hygiene and medical monitoring records are accessed and preserved.*
- *How compliance programs and other programmatic documents (including safety data sheets) are accessed and preserved.*

APPENDIX B

LEGAL COMPLIANCE REGISTER

Appendix B
NYSDEC Stand-By Contract No. D009811
Content Revision Date: 4/23/2020

Item #	Description / identity of relevant SH&E risk	Identity / citation of related legal compliance obligation	How does one gain access to the text of this legal compliance obligation?	Remarks
1	General Safety & Health	• US OSHA 29 CFR 1926.20	• www.osha.gov	
2	Safety Training Construction Safety	• US OSHA 29 CFR 1926.21 • Local Law 196	• www.osha.gov • https://www1.nyc.gov/site/buildings/safety/sst-safety.page	
3	Confined Spaces	• US OSHA 29 CFR 1926.21 • US OSHA 29 CFR 1910.147	• www.osha.gov	
4	Confined Space Permit System	See above	• www.osha.gov	
5	First Aid and Medical	• US OSHA 29 CFR 1926.23 • US OSHA 29 CFR 1926.50	• www.osha.gov	
6	Fire Protection and Prevention	• US OSHA 29 CFR 1926.24 • US OSHA 29 CFR 1926.150-155 • US OSHA 29 CFR 1926.352 • NFPA 30 and 30A	• www.osha.gov • www.nfpa.org	
7	Housekeeping	• US OSHA 29 CFR 1926.25	• www.osha.gov	
8	Sanitation	• US OSHA 29 CFR 1926.27 • US OSHA 29 CFR 1926.51	• www.osha.gov	
9	Personal Protective Equipment / Respiratory Protection	• US OSHA 29 CFR 1926.28 • US OSHA 29 CFR 1926.95-98 • US OSHA 29 CFR 1926.100-107 • US OSHA 29 CFR 1910.134	• www.osha.gov	
10	Emergency Employee Action Plans	• US OSHA 29 CFR 1926.35	• www.osha.gov	
11	Noise Exposure	• US OSHA 29 CFR 1910.95 • US OSHA 29 CFR 1926.52	• www.osha.gov	
12	Radiation Protection	• US OSHA 29 CFR 1926.53 • US OSHA 29 CFR 1926.54	• www.osha.gov	
13	Gases, Vapors, Dusts and Mists	• US OSHA 29 CFR 1926.55	• www.osha.gov	
14	Hazard Communication	• US OSHA 29 CFR 1926.59 • US OSHA 29 CFR 1910.1200	• www.osha.gov	
15	Process Safety Management	• US OSHA 29 CFR 1910.119 • US OSHA 29 CFR 1926.64	• www.osha.gov	
16	Hazardous Waste Operations and Emergency Response	• US OSHA 29 CFR 1910.120 • US OSHA 29 CFR 1926.65	• www.osha.gov	
17	Accident prevention signs and tags (Posting of required training)	• US OSHA 29 CFR 1926.200 • Local Law 196	• www.osha.gov • https://www1.nyc.gov/site/buildings/safety/sst-safety.page	
18	Signaling	• US OSHA 29 CFR 1926.201	• www.osha.gov	
19	Barricades	• US OSHA 29 CFR 1926.202	• www.osha.gov	
20	Material Storage	• US OSHA 29 CFR 1926.250	• www.osha.gov	

Item #	Description / identity of relevant SH&E risk	Identity / citation of related legal compliance obligation	How does one gain access to the text of this legal compliance obligation?	Remarks
21	Waste Disposal	• US OSHA 29 CFR 1926.252 • US EPA 40 CFR Part 260-273	• www.osha.gov • www.epa.gov	
22	Tools	• US OSHA 29 CFR 1926.300-307	• www.osha.gov	
23	Arc Welding	• US OSHA 29 CFR 1926.351	• www.osha.gov	
24	Electrical	• US OSHA 29 CFR 1926.400-415	• www.osha.gov	
25	Motor Vehicles, Mechanized Equipment	• US OSHA 29 CFR 1926.600-603	• www.osha.gov	
26	Maintenance of Electrical Equipment	• US OSHA 29 CFR 1926.43	• www.osha.gov	
27	Environmental Deterioration of Electrical Equipment	• US OSHA 29 CFR 1926.432	• www.osha.gov	
28	Scaffolding	• US OSHA 29 CFR 1926.450-454	• www.osha.gov	
29	Aerial Lifts	• US OSHA 29 CFR 1926.453	• www.osha.gov	
30	Fall Protection	• US OSHA 29 CFR 1926.500-503	• www.osha.gov	
31	Cranes, Derricks, Hoists, Elevators and Conveyors	• US OSHA 29 CFR 1926.550	• www.osha.gov	
32	Site Clearing	• US OSHA 29 CFR 1926.604	• www.osha.gov	
33	Excavations (ground disturbance)	• US OSHA 29 CFR 1926.650-652	• www.osha.gov	
34	Excavation Permit	N/A	• N/A	
35	Powered Industrial Trucks (forklifts)	• US OSHA 29 CFR 1910.178	• www.osha.gov	
36	Marine Operations and Equipment	• US OSHA 29 CFR 1926.606	• www.osha.gov	
37	Traffic Control	• General Duty Clause • NYS DOT Traffic Control Manual	• www.osha.gov • www.dot.ny.gov	
38	Waste Transportation and Handling	• US 40 CFR part 262, subpart E • US 40 CFR section 263.20 • US 40 CFR section 239-282	• www.dot.gov • www.epa.gov	
39	Working on or around Water	• US OSHA 29 CFR 1926.106	• www.osha.gov	
40	Illumination	• US OSHA 29 CFR 1926.26 • US OSHA 29 CFR 1926.5	• www.osha.gov	
41	Acceptable Certifications	• US OSHA 29 CFR 1926.29	• www.osha.gov	
42	Incorporation by Reference	• US OSHA 29 CFR 1926.3	• www.osha.gov	
43	Ventilation	• US OSHA 29 CFR 1926.57 • US OSHA 29 CFR 1926.353	• www.osha.gov	
44	Rigging	• US OSHA 29 CFR 1926.251	• www.osha.gov	
45	Gas Welding and Cutting	• US OSHA 29 CFR 1926.350	• www.osha.gov	
46	General Electrical	• US OSHA 29 CFR 1926.416	• www.osha.gov	
47	Lockout Tagout	• US OSHA 29 CFR 1926.417 • US OSHA 29 CFR 1910.147	• www.osha.gov	
48	Lockout Tagout Permit System	See above	• www.osha.gov	
49	Batteries/Battery Charging Equipment	• US OSHA 29 CFR 1926.44	• www.osha.gov	
50	Underground Construction	• US OSHA 29 CFR 1926.800	• www.osha.gov	
51	Ladders	• US OSHA 29 CFR 1926.1053	• www.osha.gov	

Item #	Description / identity of relevant SH&E risk	Identity / citation of related legal compliance obligation	How does one gain access to the text of this legal compliance obligation?	Remarks
52	Concrete and Masonry Construction	• US OSHA 29 CFR 1926.700-706	• www.osha.gov	
53	Steel Erection	• US OSHA 29 CFR 1926.750-761 and SENRAC	• www.osha.gov	
54	Caissons	• US OSHA 29 CFR 1926.801	• www.osha.gov	
55	Cofferdams	• US OSHA 29 CFR 1926.802	• www.osha.gov	
56	Compressed Air	• US OSHA 29 CFR 1926.803	• www.osha.gov	
57	Demolition	• US OSHA 29 CFR 1926. 850-860 inclusive	• www.osha.gov	
58	Power Transmission and Distribution	• US OSHA 29 CFR 1926. 950-960 inclusive	• www.osha.gov	
59	Rollover Protective Structures; Overhead Protection	• US OSHA 29 CFR 1926. 1000-1003 inclusive	• www.osha.gov	
60	Stairways and Ladders Scope	• US OSHA 29 CFR 1926. 1050	• www.osha.gov	
61	S/L General Requirements	• US OSHA 29 CFR 1926.1051	• www.osha.gov	
62	Stairways	• US OSHA 29 CFR 1926.1052	• www.osha.gov	
63	Ladder/Stair Training	• US OSHA 29 CFR 1926.1060	• www.osha.gov	
64	Diving Scope	• US OSHA 29 CFR 1926.1071-7072	• www.osha.gov	
65	Dive Team Quals	• US OSHA 29 CFR 1926.1076	• www.osha.gov	
66	Dive Safe Practices Manual	• US OSHA 29 CFR 1926.1080	• www.osha.gov	
67	Pre-dive Procedures	• US OSHA 29 CFR 1926.1081	• www.osha.gov	
68	Procedures During Dive	• US OSHA 29 CFR 1926.1082	• www.osha.gov	
69	Post Dive Procedures	• US OSHA 29 CFR 1926.1083	• www.osha.gov	
70	SCUBA Diving	• US OSHA 29 CFR 1926.1083	• www.osha.gov	
71	Surface-Supplied Air Diving	• US OSHA 29 CFR 1926.1085	• www.osha.gov	
72	Mixed-gas Diving	• US OSHA 29 CFR 1926.1086	• www.osha.gov	
73	Live boating	• US OSHA 29 CFR 1926.1087	• www.osha.gov	
74	Diving Equipment	• US OSHA 29 CFR 1926.1090	• www.osha.gov	
75	Diving Recordkeeping Requirements	• US OSHA 29 CFR 1926.1092	• www.osha.gov	
76	Traffic Movement Restriction Times	• N/A	• N/A	
77	Line Breaking	• US OSHA 29 CFR 1910.119 • US OSHA 29 CFR 1926.54	• www.osha.gov	
78	Major Material Movements	• N/A	• N/A	
79	Right-of-way Restrictions	• N/A	• N/A	
80	Bicycles/Golf Carts	• N/A	• N/A	

APPENDIX C

CORPORATE HEALTH AND SAFETY PERFORMANCE SOPs

Additional Procedures are available on the Parsons intranet site and available to all employees (https://pwebapps.parsons.com/policies/Pages)

1. Purpose

This procedure has been developed to define the requirements for the control of hazardous energy during the servicing, repair and maintenance of powered equipment and processes to minimize the potential for employee injury or equipment damage.

2. Scope

This procedure applies to Parsons Corporation and all Parsons' businesses and subsidiaries worldwide, including joint ventures and similar partnerships managed by Parsons.

3. References

3.1. 29 CFR 1910.147

3.2. NFPA 70: National Electrical Code (NEC)

3.3. NFPA 70E: Standard for Electrical Safety in the Workplace

3.4. Project Document/Records Management Procedures

4. Procedures

4.1. General Requirements

4.1.1. The Program/Project Manager will assign responsibilities for Energy Control - Lockout/Tagout (LOTO) Program Administration and Assured Grounding Plan to one Authorized Employee with qualifications in the electrical, plumbing or Heating Ventilation and Air Conditioning (HVAC) trades, with technical knowledge of the other trades, for effective implementation and oversight of this procedure.

4.1.2. An alternate will be assigned to stand in for the Administrator in case of his/her absence.

4.1.3. The Program/Project Manager will ensure the availability of appropriate LOTO materials and hardware/equipment, in sufficient quantities to support the anticipated needs of the program.

4.1.4. Although trade specific qualified personnel are permitted to work on equipment with energy applied in limited circumstances, it shall be the goal of all Parsons Project Sites to seek a "Zero Energy State" of all equipment and machines, in all cases, prior to the start of servicing and/or repair activities.

4.1.5. Only trade specific qualified personnel will be authorized to implement the requirements of the project's energy control procedure.

4.2. Application

4.2.1. LOTO is required during the servicing, maintenance and/or repair of machines and equipment when the unexpected energizing or start up of the machines or equipment, or release of store energy could cause injury to employees.

4.2.2. LOTO is required whenever an employee is required to remove or bypass a guard or other safety device.

4.2.3. LOTO is required whenever an employee is required to place any part of his or her body into an area on a machine or piece of equipment where an associated danger zone exists during machine or equipment operation.

4.2.4. LOTO is required whenever an employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually performed upon the material being processed (point of operation), or where the employee may come in contact with energized components.

4.2.5. Typical energies that will be controlled by this process include, but are not limited to, the following:

- Electrical
- Pneumatic
- Hydraulic
- Gravitational
- Spring-tension
- Thermal
- Chemical

4.2.6. Lockout is to be used whenever the energy disconnect is capable of being physically locked out.

4.2.7. Tagout can be used when an energy disconnect is incapable of being locked out.

4.2.8. In most cases both Lockout and Tagout will be used simultaneously.

4.3. LOTO Program Planning and Execution

4.3.1. Where possible, the project should develop an inventory of all tools, equipment and/or processes, prioritized in terms of high hazards and potential for employee exposure to injury for effective safety analyses.

4.3.2. The project LOTO Administrator should then ensure the performance of an Energy Source Evaluation (ESE) on each piece of equipment or process to determine the following;

- All actual and potential energies associated with the equipment/process,
- The source and magnitude of each energy present
- The location and means for isolation/disconnect of each energy source
- The means for the release of stored energy and prevention of re-accumulation
- The need for the development of a Machine Specific LOTO Procedure (MSP) for each piece of equipment or process in inventory.

4.3.3. Machine Specific LOTO Procedures

- Machine Specific LOTO Procedures (MSPs) are required to be developed, documented and utilized for each piece of equipment on the project which meets any of the following criteria;
  - o The machine or equipment has the potential for stored or residual energy or re-accumulation of stored energy after shutdown that could endanger employees.
  - o The machine or equipment has multiple energy sources and requires multiple lockout devices.

  - The isolation and locking out of those energy sources alone does not completely de-energize and de-activate the machine or equipment.
  - The lockout device is not under the exclusive control of the authorized employee performing the servicing or maintenance.
  - The servicing or maintenance creates hazards for other employees.
  - There has been a previous incident involving the unexpected activation or re-energizing of the machine or equipment during previous service or maintenance.
- MSPs are provided a unique tracking number, and each applies to a specific piece of equipment and/or process.
- MSPs are typically posted on or at the equipment to which it was developed to support.
- MSP's should be developed by the appropriate trade expert, with review and formal approval by the LOTO Program Administrator- with revision control.
- A copy of all project MSPs should be maintained in a binder managed by the Administrator, with a listing of all MSPs that identifies - in table format;
  - The unique MSP tracking number
  - The MSP Title and Scope of Work
  - Specific equipment out of operation
  - Reason why work is done
  - Which energy sources must be isolated and the hazards associated with those sources
  - Steps for shutting down and isolating the equipment including the following:
    - Location, description and position of each isolation device
    - Methods used to release residual energy
    - Methods used to confirm that residual energy was released, drained, disconnected, restrained or otherwise rendered safe
    - Methods used to secure the isolation device(s) from inadvertent operation (One-Plus)
  - Action to prevent operation of isolation devices using one of the following:
    - Exclusive Control or
    - Tags and locks
  - The latest revision date of the MSP
  - Primary user of the MSP- by trade
- As new equipment or processes are identified, they will be added to the inventory list, prioritized and scheduled for completion of the ESE, and development of the MSP if applicable.

4.4. Materials/Hardware

4.4.1. Parsons provides locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware for isolating, securing, or blocking machines or equipment from energy sources; Employees are not permitted to provide these materials at their expense.

4.4.2. The Program Manager and the LOTO Administrator will determine the best method for providing LOTO materials/hardware/equipment to those authorized personnel, which may include;

- A central LOTO Station (location) where materials/hardware are retrieved for use as needed, provided that authorized personnel on all shifts have ready-access to the devices;
- Individual LOTO Kits with appropriate types and quantities of devices provided for each authorized employee.

4.4.3. Hardware and devices are to be singularly identified to the employee applying the device.

4.4.4. Locks cannot be used for purposes other than LOTO and must be standardized by color, shape or size.

4.4.5. Two keys per lock are allowed; one key provided to the user of each lock, and one key maintained by the LOTO Program Administrator (to be allowed for device removal- to prevent the need to cut locks when the individual that placed the lock is unavailable) provided that it is kept in a secured location and under his/her control at all times.

4.4.6. Care should be taken during the purchase equipment to ensure no two locks are keyed alike.

4.4.7. Tags must be substantial enough not to be damaged by environmental conditions, must be uniform, with an identifiable warning, e.g. “Danger - Do Not Operate” (bold letters in local language), and space to write person's name (or the identity of the group lockbox), contact information and time/date tag was installed. (See Exhibit 8.2: Lockout Tagout Request Log).

4.4.8. Tags must also be able to attach securely using tie wraps (or equivalent) capable of withstanding 50 pounds of force

4.5. LOTO Technique

4.5.1. RESERVED

4.5.2. Only employees trained to the “authorized” level shall be allowed to perform LOTO.

4.5.3. Each employee involved in the application of LOTO procedures must be protected by his/her own lock(s) and tag(s) - “One exposure, one lock, one tag” for each employee, for each exposure.

4.5.4. Parsons does not permit personnel to install LOTO devices for persons other than themselves.

4.5.5. Parsons does not permit project personnel to install LOTO devices in support of contractors and/or subcontractors to which it has no contractual relationship.

4.6. LOTO Request/Log

4.6.1. A Lockout/Tagout Request Form (Exhibit 8.3) may be initiated by anyone requiring energy isolation for work activities or for taking faulty equipment out of service. The Supervisor must complete the request form and submit it to the LOTO Program Administrator for review and approval.

4.6.2. Upon request, the Administrator will;

- Work with the requesting employee, affected and authorized employees, resident engineer, SSHO, and/or other technical contacts to review the Activity Hazard Analysis to confirm the requirement for LOTO.
- Determine where LOTO has been defined as a means of controlling a hazard identified on the AHA, and review the complete list of MSP's to identify the one defined specific to that activity.
    - Where a MSP has been identified as applicable, the Administrator will review the MSP with the authorized employee to ensure complete understanding of the procedure.
    - Where a MSP has not been identified as applicable for the activity, the Administrator will advise the requesting, affected and authorized employees on the use of the generic LOTO process identified in section 4.9 in this procedure.
    - Where an Energy Source Evaluation (ESE) has yet to be completed for the specific piece of equipment or process identified in the AHA, the Administrator will ensure the ESE is completed and determine the need to develop and implement a MSP, which will then be completed expeditiously to meet scheduled maintenance activities.
- Upon completion of the MSP development (if necessary) and review with the authorized employee, the Administrator will enter the Approved LOTO Request into the LOTO Log and return to the authorized employee for posting at the job site.
- The Administrator will ensure the LOTO procedures identified in the MSP inventory are available, complete and up to date for use as required.
- Once the approved activity has been completed, the LOTO request is returned to the Administrator, who will then document the completion date/time on the log and close the event.

4.7. General LOTO Procedure

4.7.1. Procedure approval

- Where the use of this general LOTO procedure is approved for by the Administrator for use with a specific AHA, he/she will approve the requested LOTO Request and annotate the log accordingly.
- The Administrator will ensure the Authorized employees performing LOTO are familiar with the source of hazardous energy for the machine or process that will be serviced.

4.7.2. Shut down of equipment/process- the authorized person will-

- Notify affected employees that the machine is about to be shut down and locked out. Notification can be verbal, by use of a sign, barricade, etc.
- Shut down the machine using original equipment manufacturer procedures.
- Isolate the energy source by closing, blanking and blinding, or otherwise turning the switch/disconnect to the "Off" or "Closed" position.
- Apply a lock, tag, and/or other devices to the energy disconnect for the energy source present.

- Re-confirm the lack of any stored energy in rams, flywheels, springs, pneumatics or hydraulic systems, etc.
- If other energy sources are identified, stop work activities and immediately notify the LOTO Program Administrator
- Verify that the machine is isolated from the energy source by testing the machine operating controls. Return all controls to "Neutral" or "Off" position after testing.

4.7.3. Servicing or maintenance activities may now be safely completed.

4.7.4. Upon completion of servicing or maintenance activities, prepare to remove the equipment/process from LOTO.

4.7.5. Restoration of Power- Equipment Start-up- the authorized employee will-

- Check the machine to be sure it is operationally intact, tools have been removed, and guards have been replaced.
- Check to be sure that all employees are safely positioned.
- Notify all affected employees that locks/tags are going to be removed and the machine is ready for operation.
- Remove all locks, blocks, or other energy restraints.
- Restore all energy to the machine.
- Perform equipment/process start up in accordance with equipment manufacturer's recommendations.

4.8. Temporarily Restoring Power

4.8.1. If equipment must be temporarily reactivated while in LOTO, the authorized lead person performing the maintenance or service institutes the following procedures:

- Safeguard all employees by conducting a headcount to make sure everyone is clear of the equipment.
- Notify everyone in the area that LOTO is being removed.
- Check the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
- Remove all LOTO devices and re-energize the system.
- As soon as the energy is no longer needed, isolate the equipment and reapply LOTO.

4.9. Group Lockout

4.9.1. Group lockout procedures apply when there are more personnel working on a piece of equipment or process than the energy source means of disconnect or the lockout device (typically a 6-point hasp) is capable of accommodating.

4.9.2. To perform a group LOTO, the Administrator works with the authorized lead person responsible for over-seeing the activity to determine the quantity of locks, tags and devices necessary

4.9.3. The Administrator then assists the authorized lead person in reviewing the MSP associated with the AHA, completing the LOTO request, and annotates the Log entry.

4.9.4. For each energy source lockout point, the Administrator will provide a LOTO “lock-box” to the authorized lead person.

- Following the MSP or general LOTO procedure, once each energy source is disconnected and or residual power released, the authorized lead person will install one lock and tag (which identifies the Group Lockout point of contact and associated information), then places that key into the lockbox.
- Once the box is closed, all employees working on the equipment or process installs their personal lock and tag in one of the slots, locks and removes the key.
- Each employee that installed a lock/tag on the box will remain in control of their key at all times, and is not permitted to share they key or open/close locks on behalf of any other employee.

4.9.5. This will be completed for each energy source to be disconnected or released from the equipment or process, and each authorized employee working on the equipment or process must apply his/her own personal locks to the lock-box for each energy source

4.9.6. Once the servicing and/or maintenance activities are completed, the authorized lead person will coordinate the restart of the equipment or process in accordance with the MSP or general LOTO procedure.

- At the point where the LOTO devices are to be removed- each employee working on the equipment will take their key, identify their lock and tag, then remove them from the lock-box.
- The authorized lead person, being the last to remove his/her lock and tag from the lock-box, with then open the box and retrieve the key for the single lock that is on (each) energy source disconnect.
- Once all locks and tags are removed from all energy source disconnects, the authorized lead person continues with the re-start procedures identified in the MSP or general LOTO procedure.

4.9.7. Upon completion of the LOTO event for the AHA, the Log entry will be closed by the Administrator.

4.10. Shift and Personnel Changes

4.10.1. At shift changes, the relieving (authorized) shift worker must install his/her lock to the lockout device before the original worker's lock is removed.

4.10.2. The relieving employee or the authorized lead person must verify that the new lockouts are properly installed and tagged, and that the equipment will not operate.

4.10.3. Work shall not continue until the lockout has been verified (try to restart).

4.10.4. In the event that there is a break in the performance of the work, an operational lock may be used to maintain equipment in a locked out state until work is resumed.

- This operational lock shall be in the control of the Administrator or his/her designee, who shall have responsibility for its use and application.

4.10.5. Work shall not be resumed until the lockout has been verified.

4.11. Contractors/Subcontractors

4.11.1. Outside service personnel or contractors/subcontractors supporting Parsons projects shall perform work in accordance with Parsons SH&E requirements.

4.11.2. It is important that outside service personnel or contractors and local facility personnel are aware of each other's respective LOTO programs. If there are differences in the programs, these are to be communicated during the pre-job safety meeting.

- The LOTO Administrator will review the contractor/sub-contractor's submitted Control of Hazardous Energy- LOTO program/procedure prior to the start of the project and determine which plan- or combinations of plans- will be utilized during that specific AHA evaluated project.
- The Administrator is then responsible for communicating the specific Project LOTO Plan with internal and external employees; notifying facility employees if there are any variations or any additional restrictions or requirements in the contractor's LOTO procedure and providing oversight during the work execution.

4.11.3. It is expected that the Contractors program shall be at least as restrictive as the local facility.

4.11.4. The Administrator and the Project Manager will be responsible for reviewing contractor/sub-contractor submitted employee training records and qualifications.

4.12. Absent Employee Device Removal

4.12.1. Locks and tags are only to be removed by the individual who installed them. On occasion, however, an employee may be absent when devices need to be removed.

4.12.2. The following conditions must be met before the device(s) can be removed:

- A Supervisor or authorized lead person must verify that the employee is not at the facility and report the need for device removal to the LOTO Administrator, in writing.
- The Supervisor or authorized lead person must make every effort to contact the employee to inform him/her of the need for the device to be removed. This may include a telephone call to the employee's home or other location.
  - If able to be contacted, the employee will be requested to return to the facility immediately for device removal.
  - If the employee is unable to return to the facility in a reasonable amount of time, the Supervisor or authorized lead person must ascertain the last known status of the equipment the employee has locked/tagged out, and whether or not the equipment or process is safe to transfer energy control responsibility, re-start, etc,.
  - If conditional status is unknown, or the employee was unable to be contacted, the LOTO Administrator will contact Project SH&E Representative via email and phone seeking his/her

approval for the absent employee device removal, explaining the details of the effort to contact the employee.

- It is at the discretion of Project SH&E Representative, in cooperation with the LOTO Administrator and Program Manager to approve the removal of any LOTO lock, tag or device.

- Once approved, the Administrator will direct the authorized lead person to verify that it is safe to remove the LOTO devices and remove the absent employee's lock with the Administrators key only after the authorized lead person places his/her own lock and key on the energy disconnect.
- The authorized lead person will then confirm the effectiveness of the LOTO by attempting to restore power,
- The Supervisor must ensure that employee has knowledge of device removal before he or she resumes work at the facility.
- Absent employees shall always verify lockout when returning to a facility and before working on equipment that they previously locked out.
- All aspects of the absent employee device removal must be thoroughly documented.

4.13. Process System Break

4.13.1. Process system break is a specialized form of LOTO requiring the use of a permit. It is any separation of the associated components of a process system that may contain known or potential hazards.

4.13.2. Process system breaks include, but are not limited to maintenance repairs requiring cutting a pipe or tank, disconnecting pumps, opening flanges, removing valve packaging, replacing steam packing's and cutting pipelines.

4.13.3. Process System Breaks are not permitted unless specifically designed by Project SH&E Representative, and approved by Corporate Safety.

4.14. Enforcement

4.14.1. Any employee who attempts to circumvent or defeat the proper use of a LOTO device or knowingly operates equipment with these devices disabled will be subject to the projects' disciplinary action policy, up to and including termination of employment.

4.15. Periodic Inspection

4.15.1. The general LOTO procedure shall be reviewed at least once a year to assure that the energy control procedures continue to be implemented properly and that the employees are familiar with their responsibilities under those procedures.

4.15.2. Machine-specific procedures shall be reviewed annually to ensure effectiveness.

4.15.3. An authorized employee other than the one who implements the procedure shall conduct the periodic inspection and complete a report (See Exhibit 8.4: Lockout/Tagout Inspection Report). The employer designates this authorized employee as an inspector.

4.15.4. The inspector shall conduct a review of the implementation of each of the unique energy control procedures by a representative number of authorized employees.

4.15.5. For each procedure, the inspector shall also conduct a review with all other authorized employees involved in implementing the energy control procedure to review the procedure and their responsibilities under it.

4.15.6. This inspection shall be certified and shall include:

- The identity of the machine or equipment on which the energy control procedure was used;
- The date of the inspection;
- The employees included in the inspection; and
- The name of the inspector.

4.15.7. Annual inspection records shall be maintained for a minimum of three years.

4.16. Employee Training

4.16.1. Authorized Employees shall receive training in:

- The actual use of LOTO procedures;
- The recognition of hazardous energy sources;
- The types and magnitudes of energy at their facility;
- The methods and means necessary for energy isolation and control; and
- The verification of energy control procedures.

4.16.2. Annual retraining shall be provided for all authorized employees and shall include a review of all energy control procedures and their responsibilities under it.

4.16.3. Retraining must also be provided whenever there is a change in the LOTO procedure, a change in job assignment, or a periodic inspection reveals a deficiency in the program.

4.16.4. Affected Employees and Other Employees shall be instructed in:

- Recognizing when LOTO is being performed;
- The purpose of LOTO procedures; and
- The importance of not attempting to start up or use the equipment that has locked out or tagged out.

4.16.5. Affected Employees and all Other Employees shall receive annual refresher training on LOTO.

4.17. Documentation

4.17.1. The Project Safety, Health, and Environmental Representative maintains project records at the site for the duration of the projects and archives them at project closeout.

5. Definitions

Term	Definition
ANSI	American National Standards Institute

Term	Definition
ASME	American Society of Mechanical Engineers
Activity Hazards Analysis (AHA)	A process, described in Parsons ESHARP Guidelines, used to identify the hazards or potential hazards associated with each step of a particular job or work plan in order to uncover hazards and then eliminate, control, or remove them before the work is started.
Affected Employees	An employee that is not a Qualified Person that may be impacted by the presence of electrical work in their work-area.
ARC Flash	A phenomenon where a flashover of electric current leaves its intended path and travels through the air from one conductor to another, or to ground.
CFR	Code of Federal Regulations
Corporate Safety	Includes, but not limited to: SVP-Safety, Health, Environment & Sustainability, VP-Safety, Health and Environment (SH&E) and SH&E Director
Electrical Equipment	Wiring, circuits, switches, switchgear, fuses, breakers, distribution systems, buss bars, and any other equipment or system capable of containing or conducting electrical energy.
Electrical Hazard	Exposure to potentially live or energized parts from improperly designed electric installations, equipment, and conductors/wiring used for electrical distribution or from the use of production machinery and similar equipment. Hazards also include unsafe electrical work practices.
Energized	Containing electrical energy, or having the potential to contain electrical energy.
Exposure	Where hazards are present or could be created that might result in harm to personnel, equipment, or the environment if not properly controlled.
Hazardous Location(s)	An area, section or room inside a building, or an attached room or building used to store materials with hazardous properties i.e., flammable vapors, liquids or gases, or combustible dusts or fibers and flyings. It also is based on the likelihood the materials are present in quantities and concentrations that are flammable or combustible. When installing or modifying electrical systems, consider the materials, quantities and concentration for each room, section or area separately.
Isolating Device	Device that prevents the transmission or release of hazardous energy or hazardous materials. Examples include restraint blocks, electrical circuit breakers, disconnect switches, slide gates, slip blinds, or line valves. For LOTO purposes, isolating devices that provide visible indication of the device's position are desirable.
Lockout/Tagout (LOTO)	Installation of lock and tag on the isolating devices to ensure that work can be performed safely. The lock and tag ensure that the isolating device and the equipment or system they isolate or control cannot be operated until the lock and tag are removed.
OSHA	Occupational Safety & Health Administration
Potentially Energized	Electrical equipment capable of containing electrical energy that has not been locked out, tagged, and verified as de-energized by proper testing methods.

Term	Definition
Qualified Person	One who has received training and been qualified and authorized by Parsons to perform work on energized or potentially energized electrical equipment. A Qualified Person is familiar with the construction and operation of the equipment and the hazards involved with it. They also understand the electrical hazards involved with the work. Persons qualified to work safely on one piece of equipment may not be qualified to work safely on other equipment.
Red Concrete	Concrete that is colored red and applied over underground electrical installations as a warning for future excavations.
Safe Work Practice	Any job-specific practices used to protect employees from the hazards of electricity when working on or near exposed energized and de-energized parts of electrical equipment. Safety considerations include using portable electric equipment, personal protective equipment and appropriate training to ensure safe electrical work. Job specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.
Servicing and Maintenance	Workplace activities such as reconstructing, installing, setting up, adjusting, inspecting, modifying, and maintaining or servicing machines or equipment. These activities include lubricating, cleaning, or un-jamming machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energizing or startup of the equipment or release of hazardous energy. This applies to all personnel regardless of job title (operator, researcher, maintenance crafts, engineer, or construction personnel).

6. Responsibilities

The following responsibilities are typical for Parsons Projects and may be modified locally dependent upon resources available.

6.1. **Corporate Safety:** Responsible for developing and maintaining this procedure and conducting periodic reviews and updates to ensure alignment and integration with related or referenced policies and procedure; coordinating reviews by individuals and organizations responsible for and supported by implementation, including resolution of comments received; develops training materials, forms, and templates necessary to implement the procedure; and providing safety subject matter expertise and guidance to help ensure the success of this procedure. Responsible for providing support to ensure the success of this procedure and auditing its effectiveness.

6.2. **Project Manager (PM):** Ultimately responsible for delivering the project and assigning roles and responsibilities to discipline managers and the Project Management Team; responsible for reviewing, approving, implementing, and enforcing the project's assured grounding plan; designating a competent person to conduct inspections; conducting unscheduled field checks on the implementation and use of the electrical safety; authorizing all Qualified Persons; and acting as contact for red concrete cutting decisions.

6.3. **Project Engineer:** Responsible for reviewing excavation projects when red concrete is encountered.

6.4. **Records Custodian:** Responsible for documenting employee training and serving as records custodian, maintaining and archiving related documentation.

6.5. **Superintendent:** Responsible for facilitating compliance with and enforcement of this procedure; reviewing subcontractor's assured grounding plan; facilitating compliance with and enforce the project's assured grounding plan.

6.6. **Project Safety Health and Environmental Representative:** Responsible for developing, monitoring and assisting in the implementation of this procedure and the project's assured grounding plan per the Electrical Procedure on the jobsite; conducting orientations for subcontractors and new employees; determining training needs and coordinating training for affected employees; providing the regulatory expertise to ensure that activities are conducted in compliance with the applicable codes, standards, and regulations; and ensuring that AHAs are performed under competent person's action; review inspections to ensure that the plan is used effectively; and review subcontractor's assured grounding plan and provide comments to subcontractor.

6.7. **Foreman/Supervisor:** Responsible for supervising work and enforcing this procedure; and conducting daily safety huddles emphasizing safety during electrical work.

6.8. **Competent Person:** Responsible for developing and implementing the project assured grounding plan, participating in AHA's, conducting inspections before work on energized electrical equipment, and monitoring ground conductor testing.

6.9. **Qualified Person:** Responsible for performing electrical work safely, according to instructions and training received, and in compliance with assured grounding plan requirements.

6.10. **Employees:** Responsible for complying with the requirements of this procedure.

6.11. **Contractors:** Responsible for complying with all Parsons' requirements; and training their own employees in applicable Parsons' procedures.

7. Exceptions

7.1. The PM may request or require a more stringent process if required by the contract or is beneficial to the project.

7.2. **Operational Exceptions**

7.2.1. Exceptions to the requirement for LOTO implementation include minor tool changes, adjustments, and other minor servicing activities which take place during normal (production) operations if they are routine, repetitive and integral to the use of the equipment for production, and provided that the work is performed using alternative means of protection. (See Exhibit 8.1: Sample Project Lockout/Tagout Plan)

7.2.2. Implementation of the project's LOTO procedure is NOT required when ALL of the following conditions are present:

- The machine or equipment has no potential for stored or residual energy, or re-accumulation of stored energy after shutdown that could endanger employees, and
- The machine or equipment has a single energy source that can be easily identified and isolated, and

- The isolation and lockout of that energy source completely de-energizes and deactivates the machine or equipment, and
- The machine or equipment is isolated from that energy source and locked out during servicing or maintenance

- A single lockout device achieves a locked-out condition.
- The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance and may not be used by or shared with other employees.
- Servicing or maintenance does not create hazards for other employees.
- There have been no accidents involving the unexpected activation or re-energization of the machine or equipment during servicing or maintenance

7.2.3. Production jams are not immediately excluded but are dependent on the hazards present.

7.2.4. Cord and plug devices are excluded as long as the cord remains under the exclusive control of the person performing the work.

8. Exhibits

8.1. Sample Project Lockout/Tagout Plan

8.2. Lockout/Tagout Request Log

8.3. Lockout/Tagout Request Form

8.4. Lockout/Tagout Inspection Report

9. Revision History

Revision	Changes	Approver	Approval Date
4	Changed PSHEM and Program SH&E Management to Project SH&E Representative. Updated approver.	Barker, John	9/25/2019
3	Added Corporate Safety to Definitions and Responsibilities. Changed title from Control of Hazardous Energy/Lockout Tagout to Control of Hazardous Energy	Beck, Gregory	2/25/2019
2	Updated 4.3.3	Beck, Gregory	2/21/2019
1	Corrected Exhibit 8.3	Beck, Gregory	2/09/2019
0	Original Issue	Barber, Brad	7/11/2014

Exhibit 8.1: Sample Project Lockout/Tagout Plan

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

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Sample Project Lockout/Tagout Plan Instructions

The following sample program is to be used by the PSHEM as a format to develop, establish, and implement site-specific LOTO requirements and rules. We encourage the PSHEM to copy, expand, and modify the sample to customize it to the workplace. The plan must be in accordance with all state and local regulations, as well as the Lockout/Tagout Procedure.

Sample Project Lockout/Tagout Plan

Page 2 of 3

Parsons Project: ______________________

Project Location: ______________________

Project Start Date: ______________________

A. Company Policy

______is committed to the prevention of exposures that result in injury and/or illness, and to comply with all applicable state health and safety rules.

All work units of will participate in the Lockout/Tagout (LOTO) Plan. This written plan will be available in for review by any interested employee.

______is responsible for maintaining the program.

______is responsible for conducting weekly inspections.

B. LOTO Requests

Submit a LOTO request form to the Superintendent when work must be performed on electrical, hydraulic, steam, high pressure water, chemical, or any other system where failure to control the potential energy could cause injury, death or equipment damage.

(Describe where to obtain Request Forms.)

Request forms must identify potential energy hazards and establish the procedures necessary to protect employees from injury caused by the unexpected energization, startup, or release of stored energy during service or maintenance.

The Superintendent must approve LOTO requests before work begins.

C. Lockout/Tagout Log

______is responsible for maintaining the LOTO log, which includes summaries of all approved LOTO requests.

D. Access to Lockout Locks

Generally, locks are located in the jobsite office in a lockbox. The lockbox must remain locked at all times except when issuing locks and logging that issue. Keys must remain in locks until the time of issue. After the lock is issued, the key remains in possession of the person placing the locks.

(Describe location of lockbox, name of person issuing locks, name of person in possession of locks.)

E. Identifying Locks/Tags

(Describe locks and tags used on project.)

F. Subcontractor/Group LOTO

(Include group LOTO procedure to provide for when equipment or machinery maintenance or servicing is provided by a group.)

1. The superintendent has the primary responsibility for all employees working under the protection of a group LOTO. The superintendent ensures that the protection of each employee in a group LOTO is equal to or better than that of individual LOTO.

Sample Project Lockout/Tagout Plan

Page 3 of 3

2. When more than one crew is involved, the responsibility of the overall job-associated lockout or tagout control is assigned to, who is designated to coordinate affected work forces and ensure continuity of protection.
3. Each authorized employee affixes a personal LOTO device to the group lockbox when he begins work and removes the device when he stops working on the machine or equipment being serviced or maintained.
4. The keys to the locks are placed in lockbox, which is locked by (the crew or group using a group lockout device).

G. Employee Information and Training

_____ is responsible for the employer/employee training plan. Employees will be informed and trained as follows:

(Include the methods used for general and job-specific training.)

______ensures that before starting work, each new employee of attends a health and safety orientation.

H. LOTO Procedures for Specific Equipment

(Include a reference to the procedures for LOTO of specific equipment or for specific jobs or tasks. Describe where LOTO Procedures can be found.)

Job	Equipment	Procedure No.

Use the LOTO procedures to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources, and locked out before any employee begins work.

I. Compliance with this Program

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout.

Authorized employees must perform lockout as described in this procedure.

No employee will attempt to start, energize or use any machine or equipment that is locked out.

Failure to comply with this procedure will result in the following action:

(List the actions that will be taken if employees violate the procedure.)

Exhibit 8.2: Lockout/Tagout Request Log

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

Request No.	Request By	Equipment/ Location	Work Start	Est. Finish	Approval Date	Tag Placed Date	Tag Removed Date	Comments

Exhibit 8.3: Lockout Tagout Request Form

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

Work Order Number:	Parsons Project:	Tag Request Number:	
Equip. Out Of Service:	Tag/Lock Required: ☐ Yes ☐ No By: Date:	Estimated Duration:	Tag/Lock Requested: ☐ Yes ☐ No By: Date:
Scope of Work:		Tag/Lock Placement Authorization By: Date: Time:	
		Tag/Lock Removal Authorization By: Date: Time:	

Authorized Person	Device to Be Tagged			Tag/Lock			
				Number		Time	Time
	ID Number	Location	Position	Tag	Lock	Placed	Removed

Exhibit 8.4: Lockout/Tagout Inspection Report

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

Project Number: ______________________ Location: ______________________

Project Manager: ______________________ Date: ______________________

INSPECTION

Machine/Equipment Used: _____
Employees Included in Inspection: _____
Inspection Results: _____
Review of Incidents (involving LOTO): _____
Conclusion and Findings: _____

Annual Training Completed and Documented: ☐ Yes ☐ No

Inspector: ______________________

Signature: ______________________

PSHEM: ______________________

Signature: ______________________

1. Purpose

This procedure describes the process, tools, roles, and responsibilities for planning, permitting, preparing and performing excavations.

2. Scope

2.1. This procedure applies to Parsons Corporation and all Parsons' businesses and subsidiaries worldwide, including joint ventures and similar partnerships managed by Parsons.

2.2. This procedure applies to all Parsons personnel and subcontractors working on Parsons projects at any location worldwide, regardless of country of operation and/or GBU.

3. References

3.1. 29 CFR 1926, Subpart P

3.2. 29 CFR 1910.146, 1910.120(a), 1910.23(e)(7)(i)

3.3. EM 385-1-1 Safety—Safety and Health Requirements, Section 25, Excavations; Section 32.A.06, Airfield Operations: General

3.4. Utility Location and Coordination Committee, One-Call System International Directory, 2002, and Excavator's Damage Prevention Guide

3.5. *Parsons ESHARP Guidebooks, Volumes I & II*

3.6. Motor Vehicles and Equipment Procedure

3.7. Support Systems Specifications Standard

3.8. Project Document/Records Management Procedures

4. Procedures

4.1. Excavation Planning

4.1.1. During the preconstruction phase, the Project Safety, Health, and Environment Manager (PSHEM) conducts a search for drawings of all areas requiring excavation for identification of underground installations, development of Activity hazards analysis (AHA), and.

4.1.2. The project manager designates a competent person to oversee excavations, complete permits or notification forms, and perform necessary inspections of the excavation.

4.1.3. Excavation planning must consist of developing, reviewing, and/or addressing the following:

- All pertinent drawings
- Excavation permits for each excavation
- Identification of Competent Person(s)
- Design requirements for protective systems
- Identification of underground installations
- Warning system for mobile equipment

- Activity hazards analysis (AHA)

4.1.4. The Project Safety, Health, and Environmental Manager (PSHEM) audits the activities of Parsons' employees and subcontractors to ensure compliance with the plan and applicable safety and health procedures and requirements.

4.2. Excavation Permits

4.2.1. The Competent Person identifies and marks the boundaries of the excavation at least two working days, or more (where applicable) so the underground installations can be properly located by the utility operators. See section 4.5 Underground Installations for further details.

4.2.2. Before excavations begin, the PSHEM shall ensure the proper permits (Parsons', see Exhibit 8.1, and applicable state and local permits as applicable) and geophysical investigation (scanning) reports must be obtained and maintained at the excavation site.

4.2.3. Before digging and excavating, the Competent Person classifies the soil using a minimum of one visual analysis and one manual analysis testing to classify soil and rock deposits.

4.2.4. The Competent Person must submit a completed excavation permit and state permit, if required, to the PSHEM and PM.

4.2.5. Designs for protective systems by the Project Engineer must be submitted to the PM as an attachment to the excavation permit.

4.2.6. Before starting the excavation, the PM or designee conducts a pre-job walkthrough.

4.2.7. The PM or designee verifies the information, signs the excavation permit, returns a copy to the Supervisor, and informs the PSHEM. When the Supervisor receives the signed permit, work may begin.

4.2.8. The PSHEM, PM, and Project Engineer (if applicable) must sign the permit.

4.3. Surface Encumbrances

4.3.1. Remove all surface encumbrances that might create a hazard to employees or support them as necessary, to safeguard employees.

4.3.2. Do not store excavated spoils or other material closer than 2 feet from the edge of any excavation; if possible, do not store such material closer than 4 feet from the edge of any excavation.

4.3.3. Ensure that remaining surface items are visible to the equipment operator and are tagged with high-visibility tape or a reflectorized flag mounted above the object(s). Inform equipment operators of the location of these surface items before operating their equipment and provide a flag person when necessary.

4.4. Barricade Tape Identification

4.4.1. Barrier tape is required so that any employee working on the site, regardless of employer, can recognize and avoid the open excavation hazard. The Designated Person ensures that open excavations are identified with barrier tape as long as the hazard is present.

4.4.2. Barriers must be erected far enough back from the hazard to allow for adequate warning and protection.

4.4.3. Barriers must be constructed to withstand adverse weather conditions and construction traffic.

4.4.4. If the hazard is of a magnitude that requires additional protection, the superintendent must provide additional protection, as well as the barrier tape.

4.5. Underground Installations

4.5.1. To control hazards associated with coming in contact with such installations, the Competent Person identifies and marks underground installations.

4.5.2. The Competent Person must be present when excavating around a known marked utility.

4.5.3. **Underground Installations Identification**

4.5.3.1. Before an excavation is opened, the Competent Person must locate utility installations such as sewer, telephone, gas, electric, water lines, or any other underground installations that may be expected to be encountered during the excavation work.

4.5.3.2. The precise location of underground facilities that have been marked will be maintained by regular update and refreshing. Never make assumptions regarding the locations of utilities.

4.5.3.3. As a guideline for the uniform identification of underground installations, Parsons utilizes the Common Ground Alliance's call 811, the local utility companies, and/or owners prior to digging. The following website explains the Call 811 program and how it works:

http://www.call811.com/default.aspx

4.5.3.4. Before the start of actual excavation, management contacts the 811 number or utility companies or owners within the established or customary local response times, advises them of the proposed work, and requests they locate the underground utility installations.

4.5.3.5. Before approving an excavation permit, the PSHEM has the following responsibilities:

- Ensure that underground installations have been identified and/or the subsurface thoroughly inspected for underground obstructions has been completed prior to the start of work.
- Ensure that ground markings identifying underground obstructions are present.
- Evaluate the work area for potential hazards that have not been addressed by the scanning ground markings.

4.5.3.6. Use the preferred method of locating a marked utility and continue until the entire utility is located within the limits of the excavation. Do not take chances.

4.5.3.7. When the excavation approaches the estimated location of an identified underground installation, determine the exact location by a safer means, e.g. hand excavation or potholing.

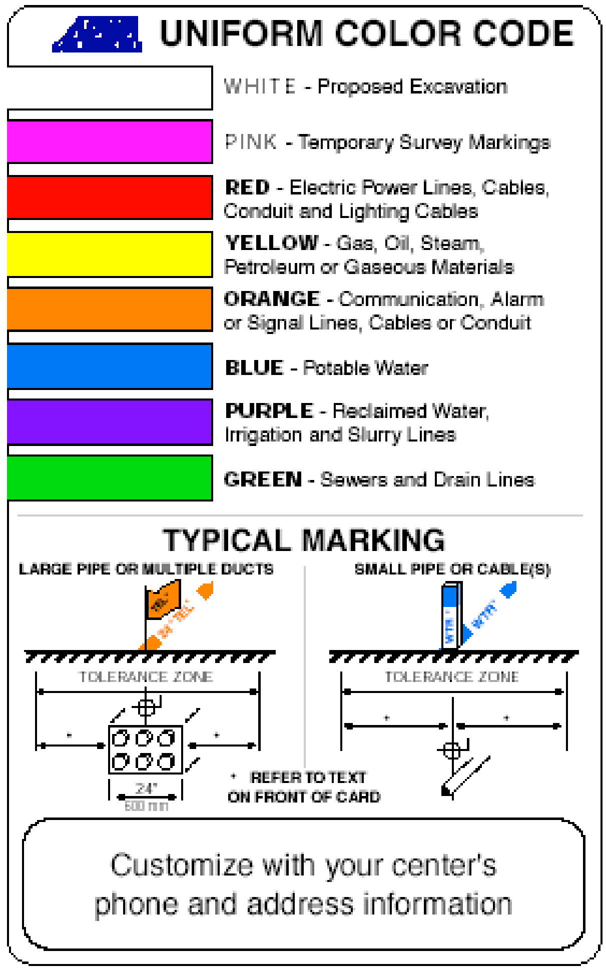
4.5.4. **Marking Utilities**

4.5.4.1. Use color-coded surface marks (paints or similar coatings) to indicate the type, location, owner, and route of buried installations.

4.5.4.2. Parsons has adopted the APWA Utility Location and Coordination Council (ULCC) Uniform Color Code (see exhibit 8.2), which can be found on the CPC or online at:

http://www.apwa.net/Documents/About/TechSvcs/One-Call/Recommended Marking_Guidelines.pdf

4.5.4.3. As illustrated on the Uniform Color Code Card, the colors and corresponding installation type are as follows:



4.5.4.4. To increase visibility, use color-coded vertical markers (temporary stakes or flags) to supplement surface marks.

4.5.4.5. All marks and markers must indicate the name, initials, or logo of the company that owns or operates the installation and the width of the installation if it is greater than 2 inches.

4.5.4.6. If the surface over the buried installation is to be removed, use supplemental offset marking. Offset markings must be on a uniform alignment and must clearly indicate that the actual installation is a specific distance away.

4.5.4.7. Before re-energizing, mark the energized direct-buried cable uncovered by excavation with red tape or red paint. Resume excavation using caution and a spotter.

4.6. Probing and Exploratory Trenching

4.6.1. In virgin soil, a probing and exploratory trenching procedure normally is not necessary. However, many Parsons projects involve chemical and refining construction in existing facilities. Extreme caution must be taken to ensure the safety of employees and the client's property. Underground utilities and other obstructions present a very real danger and every effort must be taken to determine that excavation operations are performed safely.

4.6.2. If subcontractors are used, the subcontractor supervisor and the PSHEM review in detail any pertinent drawings and as-built drawings that are available to determine the location of the piping or other underground obstacles.

4.6.3. If any underground obstructions are encountered, the PSHEM must immediately notify the designated client representative, who in turn, notifies the proper personnel to assist in identification of the obstruction and its possible removal or re-routing.

4.6.4. The Competent Person may elect to use either a dry probing or a water probing system. When using water jetting, the PSHEM must require all employees to wear safety glasses and face shields. The person who actually performs the probe must wear both a face shield and goggles.

4.6.5. Before and during excavations, the following requirements must also be met:

4.6.5.1. The area to be excavated must be swept with a metal detector (if required by client or regulatory requirement).

4.6.5.2. When excavating with mechanical equipment or other means, probing is required every 4-inches on center over the total area to be excavated (if required by client or regulatory requirement).

4.6.5.3. Use exploratory trenching at the perimeter of an area to be excavated by probing and trenching on 4-inch centers (if required by client or regulatory requirement).

4.6.5.4. Determine the depth of the trench according to the depth needed to accommodate the footings, supports, pipe, etc., to be placed inside the perimeter area.

4.6.5.5. While the excavation is open, protect, support, or remove underground installations as necessary to safeguard employees. However, do not support from the shoring without approval from a qualified engineer.

4.6.5.6. De-energize underground electrical cables if the exact locations are not known or the service is direct-buried cable not protected by a rigid-steel raceway, concrete encasement, or polyvinyl chloride (PVC) pipe. Refer to Parsons' Electrical Policies and Standards for procedures for handling red concrete/live circuits.

4.6.5.7. If pipe or other obstacles are encountered, or when excavations occur within 2 feet, (vertically or horizontally) of a direct-buried electrical or communication cable, perform exploratory hand trenching to authenticate the actual location of the cable

4.6.5.8. Use only a nonconductive hand shovel to remove soil or an air lance to loosen soil within 18 inches of energized electrical utilities that are not protected by a rigid steel raceway or concrete encasement.

4.6.5.9. The depth of probing must always exceed the depth of excavating by at least 1 foot. The selected depth of probing must be consistent; that is, if one hole is probed at 3 feet, all holes must be probed at 3 feet.

4.6.5.10. Air-operated clay spades may be used during hand excavations, provided extreme care is taken and required PPE is used. During hand excavations, if a person's head is below the top of the excavation or if the trench is deeper than 4 feet, shoring is required.

4.7. Access and Egress

4.7.1. If employees are working in trenches 4 feet deep or more, each trench must have ladders, stairways, ramps, or other means to provide safe exits. Lateral travel distance to the nearest ladder, stairway, ramp, or other safe means must be no more than 25 feet.

4.7.2. If employees or equipment must cross over an excavation greater than 4 feet deep, provide a walkway or bridge with standard guardrails.

4.7.3. A Competent Person must design and conduct daily inspections on structural ramps that are used solely by employees as a means of access or egress from excavations.

4.7.4. Structural ramps used for access or egress of equipment must be designed by a Competent Person qualified in structural design, and will be constructed in accordance with the design:

4.7.4.1. Ramps and runways constructed of two or more structural members must have the structural members connected together to prevent displacement.

4.7.4.2. Structural members used for ramps and runways must be of uniform thickness.

4.7.4.3. Cleats or other appropriate means used to connect runway structural members must be attached to the bottom of the runway or must be attached in a manner to prevent tripping.

4.7.4.4. Structural ramps used in lieu of steps must be equipped with cleats or other surface treatments on the top surface to prevent slipping.

4.8. Exposure to Vehicular Traffic

4.8.1. Employees exposed to public and/or project vehicular traffic must be provided with, and must wear, warning vests or other suitable garments marked with or made of reflective and/or high-visibility material. Temporary traffic control may be necessary where normal traffic routes are disrupted.

4.9. Exposure to Falling Loads

4.9.1. No employee is permitted underneath loads handled by lifting or digging equipment. Employees are required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

4.9.2. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped with overhead cab protection.

4.10. Warning System for Mobile Equipment

4.10.1. Operations of mobile equipment near excavations are conducted in accordance with Motor Vehicles and Equipment Procedure, and the following guidelines:

4.10.1.1. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, use a warning system such as barricades, hand or mechanical signals, or stop logs.

4.10.1.2. If possible, the grade will slope away from the excavation.

4.10.1.3. During excavations with a backhoe, observer must be present at all times to watch the backhoe bucket. This observer is stationed adjacent to the excavation to avoid the operations of the hoe. The observer is responsible for visually identifying any obstruction while the bucket is excavating and for alerting the operator immediately if any obstructions are observed. If the observer leaves the excavation area, excavation efforts must be stopped immediately until the observer returns.

4.11. Hazardous Atmospheres

4.11.1. If an oxygen-deficient atmosphere (less than 19.5% oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, (e.g., such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby), the excavation is presumed to be a permit-required confined space, unless determined otherwise by the PSHEM, in accordance with the Confined Space Procedure. Take adequate precautions to prevent employee exposure to Hazardous Materials; the use of Personal Protective Equipment (PPE); and the use of Respiratory Protection. The following minimum requirements apply:

4.11.1.1. Before employees enter potentially hazardous excavations greater than 4 feet deep, test the atmosphere for oxygen, sulfur dioxide, carbon monoxide, and flammable gas.

4.11.1.2. Take adequate precautions to prevent employee exposure to atmospheres containing:

- Less than 19.5% oxygen
- Concentrations of a flammable gas is greater than 10% of the LFL of the gas
- Concentrations of hazardous air pollutants exceeding OSHA PELs.

4.11.1.3. Precautions may include providing proper respiratory protection or ventilation for each excavation before employees enter the excavation.

4.11.1.4. When using controls that are intended to reduce the level of atmospheric contaminants to acceptable levels, conduct atmospheric monitoring as often as necessary to ensure that the atmosphere remains safe.

4.12. Rescue Equipment

4.12.1. Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, must readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment must be attended by the Competent Person when in use.

4.12.2. Employees entering bell-bottom pier holes or other similar deep and confined footing excavations must wear a harness with a lifeline securely attached to it. The lifeline must be separate from any line used to handle materials, and must be individually attended at all times while the employee wearing the lifeline is in the excavation.

4.13. Protection from Hazards Associated with Water Accumulation

4.13.1. Employees cannot work in excavations in which water has accumulated, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation.

4.13.2. The precautions necessary to protect employees adequately vary with each situation, but they could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

4.13.3. If water removal equipment is used the equipment and operations will be monitored by a Competent Person to ensure proper operation.

4.13.4. If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means must be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation.

4.13.5. Excavations subject to runoff from heavy rains require inspection by the Competent Person.

4.14. Stability of Adjacent Structures

4.14.1. Support systems such as shoring or underpinning must be provided for sidewalks, pavements, and adjacent structures that may be undermined by excavation operations. Excavations below the level of the base or footing are normally not permitted unless:

- A support system (e.g., underpinning) is used.
- The excavation is in stable rock.
- A registered professional engineer has determined that the structure is sufficiently removed from the excavation to avoid cave-ins.
- A registered professional engineer has determined that no other hazard exists.

4.15. Protection of Employees from Falling Debris

4.15.1. Provide adequate protection to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection consists of:

- Scaling to remove loose material
- Installing protective barricades at intervals as necessary on the face to stop and contain falling material
- Other means that provide equivalent protection.

4.15.2. Employees must be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Such protection is provided by:

- Placing and keeping such materials or equipment at least 2-feet from the edge of excavations.
- Using retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations.

- A combination of the above, if necessary.

4.16. Protective Systems

4.16.1. Employees working in excavations must be protected by shoring, shielding, sloping, or benching. The Competent Person must determine the exceptions to this requirement as follows:

- Excavations made entirely in stable rock.
- Excavations less than 4 feet deep and where examination of the ground by a Competent Person provides no indication of potential cave-in.

4.16.2. Protective systems must have the capacity to resist, without failure, all loads that are intended or could reasonably be expected to be applied or transmitted to the system. The Competent Person determines the degree of slope reduction below the maximum allowable level when equipment, material, or personnel loads are imposed.

4.16.3. The Competent Person selects and constructs the design of protective systems in accordance with the requirements of the Support Systems Specifications Standard, manufacturer's specifications, other tabulated data, or a design approved by the registered professional engineer.

4.16.4. When it is not feasible to attain required slope configurations in accordance with Option 1, Option 2, or Option 3 of the Support Systems Specifications Standard, the registered professional engineer must design all protective systems for excavation sites.

4.16.5. A Competent Person must monitor the construction and maintenance of the recommended protective systems and their use in excavations.

4.16.6. Ensure that support materials used are in good condition and free from damage or defect. When material or equipment used for protective systems is damaged, the Competent Person must ensure that these systems are examined by the registered professional engineer to evaluate its suitability for continued use. If the registered professional engineer cannot assure that the material or equipment can support the intended loads or is otherwise suitable for safe use, then such material or equipment must be removed from service. The registered professional engineer must evaluate and approve the materials before returning them to service.

4.16.7. **Sloping and Benching**

4.16.7.1. The registered professional engineer must approve sloping or benching for excavations greater than 20 feet in depth. The OSHA Technical Manual (http://www.osha.gov/dts/osta/otm/otm_toc.html) contains the requirements for soil classifications and sloping and benching to be used by registered engineers in determining sloping and benching for a particular excavation site.

4.16.7.2. The Competent Person selects and constructs slope and configuration of sloping and benching systems in accordance with applicable federal and state regulations.

4.16.7.3. Employees are not permitted to work above other employees on the faces of sloped or benched systems except when employees at the lower levels are protected from the hazard of falling, rolling, or sliding material or equipment.

4.16.8. **Shoring and Shielding**

4.16.8.1. Install and remove support systems so that employees are protected from cave-ins, structural collapses, and from being struck by members of the support system.

- Employees are not allowed in shields when shields are being installed, removed, or moved vertically.
- Material may be excavated to a maximum of 2 feet below the bottom of the members of a support system if the system is designed to resist the forces for the full depth of the excavation and there is no indication of soil loss from behind or below the bottom of the support system.
- Construct the support system to support the vertical portion of a trench and extend above the bottom of the sloped portion at least 18 inches, to prevent material from sliding into the trench. Clear the surface of the slope of boulders, stumps, and hard masses of earth, tools, equipment, and other surface encumbrances.
- Place timber cross braces or trench jacks in a true horizontal position, spaced vertically, and secured to prevent sliding, falling, or kick outs. Place wales with the greater dimension horizontal.
- When engineering-approved portable trench boxes or sliding trench shields are selected as the protective system, use them in accordance with the manufacturer's recommendations.

4.17. Fall Protection

4.17.1. Fall protection is required for employees working at the edge of excavations greater than 6 feet deep if excavations are not readily seen because of plant growth or other visual barrier, or if they require employees to enter and be on the vertical wall of the excavation, on the protective system, or on any other structure in the excavation.

4.17.2. Walkways and bridges over excavations must be equipped with standard guardrails in accordance with Parsons Walking/Working Surfaces Standard. Adequate barriers must be provided at all excavations. All wells, pits, shafts, etc., must be barricaded or covered.

4.17.3. Upon completion of exploration and similar operations, all wells, pits, shafts, etc., must be backfilled.

4.18. Inspections

4.18.1. A Competent Person must conduct daily inspections of excavations, access ramps, adjacent areas, and protective systems in accordance with the Daily Excavation Inspection (Exhibit 8.3) for evidence of:

- Situations that could result in possible cave-ins
- Failure of protective systems
- Hazardous atmospheres or conditions

4.18.2. The Competent Person conducts inspections when employee exposure can be reasonably anticipated:

- Prior to the start of work

- As needed throughout the shift
- After every rainstorm or other hazard-increasing condition

4.18.3. If the Competent Person finds evidence of a situation that could result in a possible cave-in, failure of protective systems, or any hazardous atmosphere or condition, he immediately notifies the exposed employees to evacuate the excavation until precautions can be taken to ensure their safety and notifies the PM of such conditions.

4.18.4. The Competent Person is responsible for taking whatever measures are appropriate to correct or eliminate potentially hazardous conditions associated with the excavation before any additional work in that section of the excavation continues.

4.18.5. The Competent Person submits the completed inspection forms to the PSHEM each month. The PSHEM reviews the inspection forms and monitors excavations on projects.

4.19. Training

4.19.1. Parsons trains affected employees and the Competent Person at the time of their initial assignment. Subcontractors must train their own employees. However, the PSHEM must ensure that all workers involved in the task receive all known information.

4.19.2. The PSHEM arranges employee awareness training for affected employees who conduct work within or near excavations. Employees are trained on the following topics:

- Requirements of the standards
- Requirements of the project excavation plan
- Hazards relating to excavation work
- Methods of protection for excavation hazards
- Use of PPE
- Procedures regarding hazardous atmospheres
- Emergency and non-entry rescue procedures

4.19.3. The PSHEM arranges training for the Competent Person. The PSHEM evaluates the Competent Person annually in accordance with the Competent Person Assessment Checklist (Exhibit 8.4). Training includes the following topics:

- Methods of evaluating the site and conducting inspections in accordance with this CSHM element
- Evaluation and selection of protection methods
- Ensuring compliance with this CSHM element
- Requirements under additional applicable elements such as Confined Space and Fall Protection Policies/Procedures

4.19.4. During daily huddles, Supervisors review the relevant AHAs with excavation workers and brief them on details of the following:

- Type of excavation to be performed
- Location, depth, and overall size of the excavation

- Shoring/shielding/sloping requirements
- Means of entry and egress
- Special conditions and permits anticipated (such as confined space)
- Existing buried utilities and hazards
- Remaining surface items located near the excavation
- Equipment to be used
- Provisions for disposal of spoilage
- Work to be performed in the excavation

4.19.5. Employees are retrained every 3 years or when there are inadequacies in the employee's knowledge or use of excavations. The retraining re-establishes the employee's proficiency.

4.19.6. Using an acceptable training form, the records custodian maintains a record of all training or instruction given to employees.

4.20. Documentation

4.20.1. The records custodian documents all excavation instruction, training, and retraining records. Records and verifies completion of training is kept in the employee's individual training files.

4.20.2. All information regarding the identification of underground installations is transferred to the appropriate drawings and/or prints and must be available on site. Drawings and/or prints are maintained for the life of the project.

4.20.3. The Project Engineer's recommended protective systems must be documented in sufficient detail to establish compliance with applicable regulatory excavation requirements. The recommendations must be signed by the Project Engineer, and the report must be maintained at the jobsite.

4.20.4. When manufactured support systems are used, the manufacturer's written specifications, recommendations, and limitations must be maintained at the jobsite.

4.20.5. The PSHEM maintains the project records (including designs, permits, notices, and completed inspections) at the site for the duration of the project and archives them at project closeout.

5. Definitions

Term	Definition
Activity Hazards Analysis	A procedure, described in Parsons SHARP Manual, used to identify the hazards or potential hazards associated with each step of a job or work plan to uncover hazards and then eliminate, control, or remove them before the work is started.
Adjacent Structure Stability	The stability of the foundation of adjacent structures whose location may create surcharges, changes in soil conditions, or other disruptions that could extend into the failure zone of the excavation.
Aluminum Hydraulic Shoring	A manufactured shoring system consisting of aluminum hydraulic cylinders (cross braces) used with vertical rails (uprights) or horizontal rails (wales). Such a system is designed to support the sidewalls of an excavation and prevent cave-ins.

Term	Definition
Bell-bottom Pier Hole	A type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.
Benching or Benching System	A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or more horizontal steps, usually with vertical or near-vertical surfaces between levels.
CFR	Code of Federal Regulations
Competent Person	A person trained to identify unsafe hazards or working conditions in the workplace or working conditions with authority to have the hazards eliminated or controlled.
Cross Braces	The horizontal members of a shoring system installed from side to side of the excavation. The cross braces bear against either uprights or wales.
Excavation	Any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.
Faces or Sides	The vertical or inclined earth surfaces formed as a result of excavation work.
Hazardous Atmosphere	An atmosphere that is explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, and that may cause death, illness, or injury.
Kickout	The accidental movement or failure of a cross brace.
Protective System	A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.
Ramp	An inclined walking or working surface that is used to gain access to one point from another. A ramp may be constructed from earth or from structural materials such as steel or wood.
Sheeting	The members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.
Shield or Shield System	A structure used in an excavation to withstand cave-ins and that protects employees working within the shield system. Shields can be permanent structures or portable units moved along as work progresses.
Shoring or Shoring System	A structure that is built or put in place to support the sides of an excavation to prevent cave-ins.
Sloping or Sloping System	Sloping the sides of the excavation away from the excavation to protect employees from cave-ins. The required slope varies with soil type, weather, and surface or near surface loads that could affect the soil in the area of the trench (e.g., adjacent buildings, or vehicles near the edge of the trench.
Stable Rock	Natural solid mineral material that can be excavated with vertical sides that will remain intact while exposed.
Structural Ramp	A ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.
Support System	A structure such as underpinning, bracing, or shoring that provides support to an adjacent structure, underground installation, or the sides of an excavation.

Term	Definition
Surface Encumbrances	Underground utilities, foundations, streams, water tables, transformer vaults, and geologic anomalies.
Surcharge	An excessive vertical load or weight caused by spoil, overburden, vehicles, equipment, or activities that could affect stability.
Trench	A narrow excavation (in relation to its length) made below ground surface.
Unconfined Compressive Strength	The load per unit area at which soil will fail in compression.
Underground Installations	Utilities, tunnels, shafts, vaults, foundations, and other underground fixtures or equipment that might be encountered during excavation work.
Uprights	The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights that are placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called sheeting.
Wales	Horizontal members of a shoring system placed in the direction of the excavation face whose sides bear against the vertical members of the shoring system or earth (uprights or sheeting).

6. Responsibilities

6.1. **Safety Director, Corporate SH&E:** Responsible for developing and maintaining this procedure and conducting periodic reviews and updates to ensure alignment and integration with related or referenced policies and procedure; coordinating reviews by individuals and organizations responsible for and supported by implementation, including resolution of comments received; develops training materials, forms, and templates necessary to implement the procedure; and providing safety subject matter expertise and guidance to help ensure the success of this procedure.

6.2. **GBU Safety Director:** Responsible for providing support to ensure the success of this procedure and auditing its effectiveness.

6.3. **Project Manager (PM):** Ultimately responsible for delivering the project and assigning roles and responsibilities to discipline managers and the Project Management Team; developing, approving, implementing, and enforcing the project excavation plan; conducting a pre-excavation walkthrough; reviewing and approving excavation permits; designating Competent Person(s) to conduct activities within the excavation plan; designating observer(s), as appropriate; responding to possible cave-ins; and conducting unscheduled field checks on the implementation of the excavation plan

6.4. **Project Engineer:** Responsible for approving and/or designing necessary protective measures, including sloping or benching greater than 20 feet deep; examining damaged protective structures; evaluating hazards to adjacent structures; and reviewing and approving excavation permits, if necessary.

6.5. **Records Custodian:** Responsible for documenting employee training and serves as records custodian, maintaining and archiving related documentation.

6.6. **Superintendent:** Responsible for facilitating compliance with and enforcement of this procedure; reviewing subcontractor’s excavation plan; scheduling excavations; facilitating compliance with and enforce the project excavation plan; and maintaining excavation equipment and support.

6.7. **Project Safety, Health, and Environmental Manager (PSHEM):** Responsible for developing, monitoring and assisting in the implementation of this procedure on the jobsite; conducting orientations for subcontractors and new employees; and determining training needs and coordinating training for affected employees; providing the regulatory expertise to ensure that activities are conducted in compliance with the applicable codes, standards, and regulations; and ensuring that AHAs are performed, participate in Parsons Site Management Team, and maintain and archive project SH&E records; and collecting subcontractor documentation and provide comments to subcontractor.

6.8. **Foreman/Supervisor:** Responsible for supervising work and enforcing this procedure; and conducting daily safety huddles emphasizing safety during excavations and reviewing excavation-related AHAs, as applicable.

6.9. **Competent Person:** Responsible for determining probing methods; determining the degree of slope reduction; selecting, conducting design of, and monitoring protective systems; conducting daily inspections of the excavation; correcting or eliminate potentially hazardous conditions; monitoring water control and removal equipment; attending use of rescue equipment; and completing and submit excavation permit

6.10. **Designated Person(s):** Responsible for classifying the soil before digging and excavation; and marking open excavations and underground obstructions.

6.11. **Observer:** Responsible for watching for obstructions during excavation

6.12. **Employees:** Responsible for complying with the requirements of this procedure and maintaining awareness of hazards in work area.

6.13. **Subcontractors:** Responsible for complying with all Parsons' requirements; training their own employees in applicable Parsons' procedures; developing, submitting, implementing, and enforcing subcontractor excavation plans; and maintain and inspecting subcontractor excavations.

7. Exceptions

7.1. The PM may request or require a more stringent process if required by the contract or is beneficial to the project.

7.2. This standard does not detail the specific engineering requirements for shoring systems.

8. Exhibits

8.1. Excavation Permit

8.2. Support Systems

8.3. Daily Excavation Inspection Form

8.4. Competent Person Assessment Checklist

9. Revision History

Revision	Changes	Approver	Approval Date
0	Original Issue	Brad Barber	12/24/2014

Exhibit 8.1: Excavation Permit

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

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Supervisor(s):	Date/Time Issued: Date/Time Expires:
Location of Excavation:	
Excavation Dimensions:	
Soil Type:	
Nature of Work*:	

**If the nature of work is subject to change, a new permit must be issued.*

Safety Requirements/Precautions	Yes	No	NA
1. Surface Encumbrances Identified/Secured	☐	☐	☐
2. Underground Utilities Identified/Located	☐	☐	☐
3. Utilities Protected	☐	☐	☐
4. System Lockout/Tagout (Tag ID No.)	☐	☐	☐
5. Access and Egress	☐	☐	☐
6. Protection From Vehicular Traffic	☐	☐	☐
7. Equipment/Tool Grounding	☐	☐	☐
8. Manual Digging	☐	☐	☐
9. Protection From Water Accumulation	☐	☐	☐
10. Warning System For Mobile Equipment	☐	☐	☐
11. Stability of Adjacent Structures	☐	☐	☐
12. Site Inspections	☐	☐	☐
13. Confined Space Permit	☐	☐	☐
14. Atmospheric Testing	☐	☐	☐

15. Additional Safety Requirements/Precautions:

Excavation Permit

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Atmospheric Testing Results

1. **Oxygen Test** — Note: Safe Range of 20.5% to 22% required

Initial Testing Required — Periodic Testing Required

Test Time: ______________________ % Oxygen: ______________________

______________________ ______________________

______________________ ______________________

2. **Combustible Test** — Note: Safe Range < 10% LEL

Initial Testing Required — Periodic Testing Required

Test Time: ______________________ % LEL: ______________________

______________________ ______________________

______________________ ______________________

3. **Toxicity Test** — Substance Tested For: ______________________

Time Tested: PEL/TLV: Exposure Level: ______________________

Person Taking Sample: ______________________

*** * * IN CASE OF EMERGENCY, CALL EXTENSION_____* * ***

Protective System

1. Sloping and benching:_____	OPTION:	1 ☐	2 ☐	3 ☐	4 ☐
2. Support System (Shoring):_____	OPTION:	1 ☐	2 ☐	3 ☐	4 ☐
3. Shield System: _____	OPTION:	1 ☐	2 ☐	3 ☐	4 ☐

Date/Time Work Start:______________ Date/Time Completed:__________/__________

Approval:______________________ Date/Time:__________/__________

Approval: ______________________ Date/Time: __________/__________
Owner Representative

Approval: ______________________ Date/Time: __________/__________
Parsons Supervisor

Approval: ______________________ Date/Time: __________/__________
Parsons Engineer

Approval: ______________________ Date/Time: __________/__________
Parsons Safety Representative

Exhibit 8.2: Support Systems

The most current version of this form is available for download and use on the Parsons Corporate Policy Center and online at:

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PARSONS Support Systems

The competent person selects the design of support systems, shield systems, and other protective systems to be constructed in accordance with one of the following options.

Option 1: Designs Using Regulatory Compliance Criteria

1.1 Use timber shoring and aluminum hydraulic shoring in accordance with federal, state, or local regulatory compliance criteria. If this option is selected, contact PSHEM to coordinate design and implementation of these systems.

Option 2: Designs Using Manufacturer's Tabulated Data

2.1 Construct support systems, shield systems, or other protective systems (e.g., trench boxes) drawn from manufacturer's tabulated data and use them in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

2.2 Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer are allowed only after the manufacturer issues specific written approval.

2.3 Manufacturer's specifications, recommendations, and limitations—and manufacturer's approval to deviate from the specifications, recommendations, and limitations—must be kept in written form at the jobsite during construction of the protective system. After that time, this data may be stored off the jobsite, but a copy must be available to EHSS upon request.

Option 3: Designs Using Other Tabulated Data

3.1 Select the designs of support systems, shield systems, or other protective systems in accordance with tabulated data, (e.g., tables and charts) and construct them accordingly. The tabulated data must be in written form and must include all of the following information:

- Factors that affect the selection of a protective system drawn from such data
- Limits of use of the data
- Information needed by the user to select the correct protective system from the data

3.2 At least one copy of the tabulated data, identifying the registered professional engineer who approved the data, must be maintained at the jobsite during construction of the system. After that time the data may be stored off the jobsite, but a copy of the data must be made available to EHSS upon request.

Option 4: Design by a Registered Professional Engineer

4.1 Support systems, shield systems, and other protective systems not using the options detailed in options 1, 2, or 3 above must be approved by a registered professional engineer.

4.2 Designs must be in written form and must include the following:

- A plan indicating the sizes, types, and configurations of the materials to be used in the protective system
- The identity of the registered professional engineer approving the design

4.3 At least one copy of the design must be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design must be available to EHSS upon request.

Support Systems

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Materials and Equipment

- Materials and equipment used for protective systems must be free from damage or defects that might affect their proper function.
- Manufactured materials and equipment used for protective systems must be used and maintained in accordance with the recommendations of the manufacturer, and in a manner that prevents employee exposure to hazards.
- If material or equipment used for protective systems is damaged, the competent person must ensure that these systems are examined by a qualified person to evaluate its suitability for continued use. If the competent person cannot assure the material or equipment can support the intended loads or is otherwise suitable for safe use, then such material or equipment must be removed from service. These materials or equipment must be evaluated and approved by a registered professional engineer before they are returned to service.

Installation and Removal of Support

- Members of support systems must be securely connected together to prevent sliding, falling, kickouts, or other potential hazards.
- Support systems must be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.
- Individual members of support systems cannot be subjected to loads that are greater then those they were designed to withstand.
- Before temporary removal of individual support members begins, additional precautions must be taken as directed by the competent person to ensure the safety of employees. These precautions could include the installation other structural members to carry the loads imposed on the support system.
- Removal of support systems must begin at, and progress from, the bottom of the excavation. Members must be released slowly. If there is any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation, the work must be halted until it can be examined by the project manager.
- Backfilling must progress together with the removal of support systems from excavations.
- Additional requirements for support systems for trench excavations are as follows:
- Excavation of material to a level no greater than 2 feet below the bottom of the members of a support system is allowed, but only if the system is designed to resist the forces calculated for the full depth of the trench. While the trench is open, there must be no indication of a possible loss of soil from behind or below the bottom of the support system.
- Installation of a support system must be closely coordinated with the excavation of trenches.

Shield Systems

- Shield systems cannot be subjected to loads that are greater than those they were designed to withstand.
- Shields must be installed in a manner that restricts lateral or other hazardous movement of the shield that could occur during cave-in or unexpected soil movement.

Support Systems

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- Employees must be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.
- Employees are not allowed in shields when shields are being installed, removed, or moved vertically.
- In trench excavations, excavation of material to a level no greater than 2 feet below the bottom of the shield system is allowed, but only if the system is designed to resist the forces calculated for the full depth of the trench. While the trench is open, there must be no indication of a possible loss of soil from behind or below the bottom of the shield system.

Exhibit 8.3: Excavation - Daily Inspection Form

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

Date: Job No: Location:

Competent Person: Gas Monitor Ser. No.:

Inspect excavations throughout the work period. If conditions change, complete a new inspection form.

Time: ______ ☐ a.m. ☐ p.m. Weather:

Time: ______ ☐ a.m. ☐ p.m. Weather:

Time: ______ ☐ a.m. ☐ p.m. Weather:

Time: ______ ☐ a.m. ☐ p.m. Weather:

Time: ______ ☐ a.m. ☐ p.m. Weather:

Locates Date: Confirmation No.: Locates Visible: ☐ Yes ☐ No

Jobsite Hazards		Work Practices			
Vehicular Traffic	Mobile Equipment	Traffic Control:	Signs	Cones	Barricades
Overhead Obstruction	Underground Installations	Ladders:	Within 25 ft.	Extends 3 ft.	Accumulation
Falling Loads	Hazardous Atmosphere	Dewatering:	CP Monitors	Proper Operations	Supplied Air
Adjacent Structures	Surface Encumbrances	Atmosphere:	Ventilation	Monitoring	Other
		Equipment:	>2 ft. from edge	Warning Devices	

Soil Stability

Previously disturbed by underground structures or utilities? ☐ Yes ☐ No	Soil subject to thawing conditions? ☐ Yes ☐ No
Soil subject to vibration from adjacent area or from equipment used in the excavation? ☐ Yes ☐ No	Soil subject to surcharge from spoils, materials, or equipment? ☐ Yes ☐ No

Visual Test

☐ Yes ☐ No Soil spill from excavator bucket in cohesive clumps or granular stream?	☐ Yes ☐ No Particle sizes of predominate soils are fine grained, course grained, or gravel?
☐ Yes ☐ No Soil exist in layered system Layers slope: % Slope:	☐ Yes ☐ No Soil is fissured?
☐ Yes ☐ No Presence of rock?	☐ Yes ☐ No Rock is stable?
☐ Yes ☐ No Accumulating runoff?	☐ Yes ☐ No High groundwater table?
☐ Yes ☐ No Seeping from sides?	☐ Yes ☐ No Submerged in surface water (creeks, etc.)?

Manual Test

Penetrometer Readings (Minimum of five test must be completed)

1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

Average tsf: <0.5 tsf = Type C 0.5 – 1.5 tsf = Type B >1.5 tsf = Type A

Plasticity Test:

Length of 1/8" thread that can be held horizontally inches <2" = Granular >2" = Cohesive

Thumb Penetration Test:	TYPE A	TYPE B	TYPE C
All tests should be run on: • Large clump of spoil material • As soon as excavated • Later after wetting • Reclassified	☐ Great effort/not at all Can only indent	☐ Moderate Effort	☐ Easy: Molded by light finger pressure

Soil Test Classification	Personnel Protective System Chosen
Results of Testing: Soil Type ☐ A ☐ B ☐ C ☐ D	**Protection Chosen:** ☐ **Sloping** ☐ **Shielding** ☐ **Shoring**

Trench Box Information

☐ Yes ☐ No Trench box drawings available?	☐ Yes ☐ No PE Stamped drawings available for special shoring?
☐ Yes ☐ No Stack locking Pins available and used?	☐ Yes ☐ No Spreader bar pin installed and safety pined?

Comments:

NOTE: All unsafe conditions must be corrected before trench entry. If any hazardous conditions are observed, the trench must be immediately evacuated and no one allowed to re-enter until corrective action has been taken.	(To be completed by the designated competent person) **Excavation Entry Authorized By:** **Print Name:** **Competent Person** **Signature:**

Exhibit 8.5: Competent Person Assessment Checklist

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

Employee Name: ____________________

Interviewed by: ____________________

	QUESTIONS	RESPONSES	P	NP
1.	Prior to excavating, how are underground utilities located?	Call AWPA One Call	☐	☐
2.	Who can design structural ramps use for access or egress from excavations?	The competent person.	☐	☐
3.	How far apart must ladders, stairways, or ramps be spaced when used as a means of egress from trench excavations?	No more than 25 feet of lateral travel for employees.	☐	☐
4.	When is atmosphere testing required prior to entry into an excavation? Give two examples.	Where oxygen deficiency or a hazardous atmosphere exist or could reasonable be expected to exist in excavations greater than 4 feet. Operating gas-powered equipment in an excavation. Striking a utility such as a gas line. Natural decay products.	☐	☐
5.	What precautions can be taken to prevent employee exposure to oxygen-deficient atmosphere?	Continuous ventilation.	☐	☐
6.	Can an employee work in an excavation where there is an accumulation of water?	Only when adequate precaution has been taken to protect employees against the hazards posed by water accumulation. (i.e., trench box, water removal, or use of safety harness and life- line.	☐	☐
7.	Who monitors the water removal operations?	The competent person.	☐	☐
8.	What are some methods used to prevent materials (loose rock or soil) from falling into an excavation?	Scaling Protective barricades	☐	☐
9.	How far from the edge of an excavation should materials and equipment be placed?	Material and equipment must be stored at least 2 feet from the edge of an excavation if no protective barricade is in place.	☐	☐
10.	How frequently does an excavation must be inspected?	Every day at the beginning of the work shift, throughout the day, and after every rainstorm or other hazard causing event.	☐	☐
11.	How does the competent person document these inspections?	On the daily excavation inspection form.	☐	☐
12.	What is the competent person evaluating when he/she conducts the daily inspections?	Adjacent areas, protective systems, evidence of a situation that could result in possible cave-ins, indications of failure in protective systems, hazardous atmospheres, or other hazardous conditions.	☐	☐
13.	When is fall protection required when working in or around excavations?	Where walkways extend over an excavation >4 feet deep.	☐	☐
14.	What are some means of adequate barrier physical protection for excavations?	Warning lines, physical barriers, manhole covers, guard rails, plywood with the word HOLE painted on it.	☐	☐
15.	How does the competent person verify capacity of protective systems?	Tabulated data stamped by registered engineer readily available onsite. Competent person should demonstrate ability to read and understand specifications.	☐	☐
16.	How far can material be excavated below the bottom members of a support system?	2 feet maximum.	☐	☐

1. Purpose

1.1. This procedure describes the process, tools, roles, and responsibilities for fall protection. This policy applies to all Parsons personnel and subcontractors working on Parsons projects at any location worldwide, regardless of country of operation and/or BU.

1.2. This procedure is not inclusive of all regulations and legislation; rather, it provides an overview. Each work site and each work area within a project may require different and specialized fall protection planning and equipment.

1.3. This procedure does not cover specific fall protection for ladders, scaffolds, or aerial lifts, which are covered in the Ladders Procedure; the Scaffolds Procedure; and the Aerial Lifts Procedure. Also, this procedure does not cover requirements for floors, platforms, and walkways including guardrail and toeboard systems, which are included in the Walking/Working Surfaces Procedure.

2. Scope

This procedure applies to Parsons Corporation and all Parsons' businesses and subsidiaries worldwide, including joint ventures and similar partnerships managed by Parsons.

3. References

3.1. 29 CFR 1910.66, Appendix C

3.2. 29 CFR 1926.104–1926.105, 1926.500–1926.503, 1926.759–1926.760, 1926.959

3.3. EM 385-1-1, Safety – Safety and Health Requirements, Section 21.A.15, Safe Access and Fall Protection; Section 21.C, Personal Fall Protection Systems and Safety Nets, and Section 05.F, Personal Protective Equipment: Body Belts, Harnesses, Lanyards, and Lifelines – Selection of Components

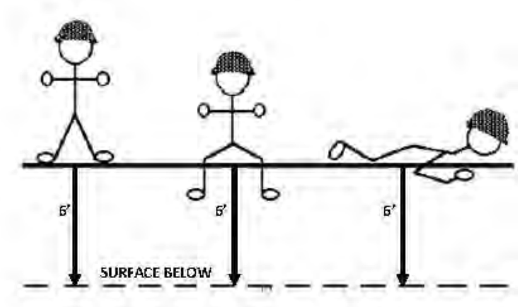
3.4. *Parsons ESHARP Guidebook*, Volumes I & II

3.5. Project Document/Records Management Procedures

4. Procedures

4.1. Parsons Fall Protection Procedure

4.1.1. Thorough planning and supervision by competent/qualified person(s) is required to meet Parsons 100% fall protection goal for all personnel. The following procedure is used to assess the job and determine the appropriate fall protection:



4.1.2. Every effort must be made to conduct the work without doing elevated work. All employees exposed to a fall hazard greater than 6 feet (1.8 m) must be protected in the preferred order by a guardrail system, covers, then by a conventional fall protection system, which is defined as a personal fall arrest system, safety nets, or controlled access zones to protect employees from the consequences of a fall. Fall protection is also required for employees working in the following areas:

4.1.2.1. At the edge of excavations greater than 6 feet (1.8 m) in depth where excavations are not readily seen because of plant growth or other visual barrier, or that require employees to enter and be on the vertical wall of the excavation, on the protective system, or on any other structure in the excavation.

4.1.2.2. On accessways or work platforms over water, machinery, or dangerous operations.

4.1.2.3. On runways from which they may fall 4 feet (1.2 m) or more.

4.1.3. The project manager ensures that fall hazard issues are considered and resolved in the design review of any new equipment and facilities. Potential fall hazards are identified in Activity Hazard Analyses (AHAs).

4.1.4. The competent person selects appropriate personal fall protection systems and equipment based on the type of work; the work environment; the weight, size and shape of the user; the type and position of anchorage; and the length of the lanyard.

4.1.5. If the competent person cannot determine an acceptable method to complete the job, the competent person consults with a qualified person. The qualified person must determine an acceptable method to complete the job.

4.1.6. Before allowing employees into areas where fall hazards exist, Parsons provides training and completes inspections as required in this procedure.

4.2. Project Fall Protection Plan

4.2.1. The competent person in charge of the work develops and implements a project fall protection plan in accordance with federal, state, and local regulations, manufacturers recommendations, and this procedure. The project fall protection plan is included in the project safety plan in accordance with Parsons ESHARP Guidebook, Volumes I & II and must be approved by the Project Manager.

4.2.2. The qualified person must approve the project fall protection plan; the competent person must supervise the work.

4.2.3. The project manager and Project Safety Health and Environmental Manager (PSHEM) facilitate implementation and compliance with the plan.

4.2.4. The competent person is responsible for overseeing the project fall protection plan and will monitor the employees and subcontractors to ensure compliance.

4.2.5. Subcontractors must develop and implement a written fall protection plan, which must be submitted to the project subcontracts manager and approved before beginning work at elevated heights on Parsons' project sites.

4.2.6. At a minimum, the project fall protection plan includes the following information:

4.2.6.1. The names or other methods of identification of each employee who is designated to work in controlled access zones. No other employees may enter a controlled access zones.

4.2.6.2. Name of the person responsible for maintaining the program and communicating program requirements to employees

4.2.6.3. Name of qualified person(s)

4.2.6.4. Name of competent person(s)

4.2.6.5. AHAs - Potential fall hazards may include:

- Holes in walking/working surfaces
- Elevated walking/working surfaces 6 feet or more above a lower level
- Skylights and smoke domes
- Wall openings such as those for windows or doors
- Trenches and other excavations
- Walking/working surfaces from which workers could fall onto dangerous equipment
- Hoist areas where guardrails have been removed to receive materials
- Sides and edges of walking/working surfaces such as established floors, mezzanines, balconies and walkways greater than 6 feet (1.8 m) above a lower level and not protected by guardrails
- Ramps and runways that are not protected by guardrails
- Leading edges that change location as additional sections are added
- Wells, pits, or shafts not protected by guardrails, fences, barricades, or covers

4.2.6.6. Method(s) workers will use to access the elevated work area

4.2.6.7. Fall prevention to be used

4.2.6.8. Approved anchor point(s) to be used

4.2.6.9. Method(s) to address potential hazards of placing workers and/or equipment on surfaces not designed for walking or working

4.2.6.10. Method(s) for lifting and storing equipment

4.2.6.11. Rescue method(s) to be used including (See Section 4.9):

- Method(s) for workers doing elevated work to communicate with workers on the ground
- Workers available on the ground who are able to operate the controls of elevated work equipment

4.2.6.12. Conduct an onsite inspection of Life Critical Guards after they have been erected, modified or removed and after completion of work and confirm:

- Life Critical Guards are in place and labelled, or
- Life Critical Guards are replaced with permanent guardrails, flooring, grating or otherwise returned to original state, and
- Grating has been inspected by a Qualified Person, if applicable

4.2.6.13. Method of control, fall arrest, or fall restraint to be provided where fall hazards may exist

4.2.6.14. Provisions for fall protection for employees erecting or removing fall protection system components

4.2.6.15. Provisions for fall prevention systems, such as controlled access zones and warning line systems with safety monitoring systems

4.2.6.16. Provisions specified in Section 4.10 Training (below) if alternate methods are to be used

4.2.6.17. Provisions for inspections of job sites, materials, and equipment by a competent person

4.2.6.18. Provisions for transferring ownership and responsibility of fall protection systems left in place

4.2.6.19. Provisions for the handling, storage and securing of tools and materials

4.2.6.20. Provisions for training

4.2.6.21. Method of providing overhead protection for workers and general public who may be in, or pass through, the area below the work site (i.e. sidewalk sheds)

4.2.6.22. Emergency procedures for prompt, safe removal of injured workers

4.2.6.23. In the event a worker falls, or some other related, serious incident occurs (e.g., near miss), the employer shall investigate the circumstances of the fall or other incident to determine if the fall protection plan needs to be changed (e.g., new practices, procedures, or training) and shall implement those changes to prevent similar types of falls or incidents.

4.3. Personal Fall Arrest Systems

4.3.1. Employees must use a personal fall arrest system when they work greater than 6 feet (1.8 m) from the floor AND one of the following conditions exists:

4.3.1.1. Work requires them to be outside the confines of the structure, i.e., if the employee's belt buckle is not between the rails.

4.3.1.2. Work requires application of sufficient force that could lead to loss of balance, e.g., leaning into a pipe wrench in a way that may cause a fall if the worker slips or the fitting suddenly breaks loose.

4.3.2. Fall arrest systems must meet the following requirements:

4.3.2.1. Limit the maximum arresting force on an employee to 1,800 pounds (816 kg) when used with a body harness.

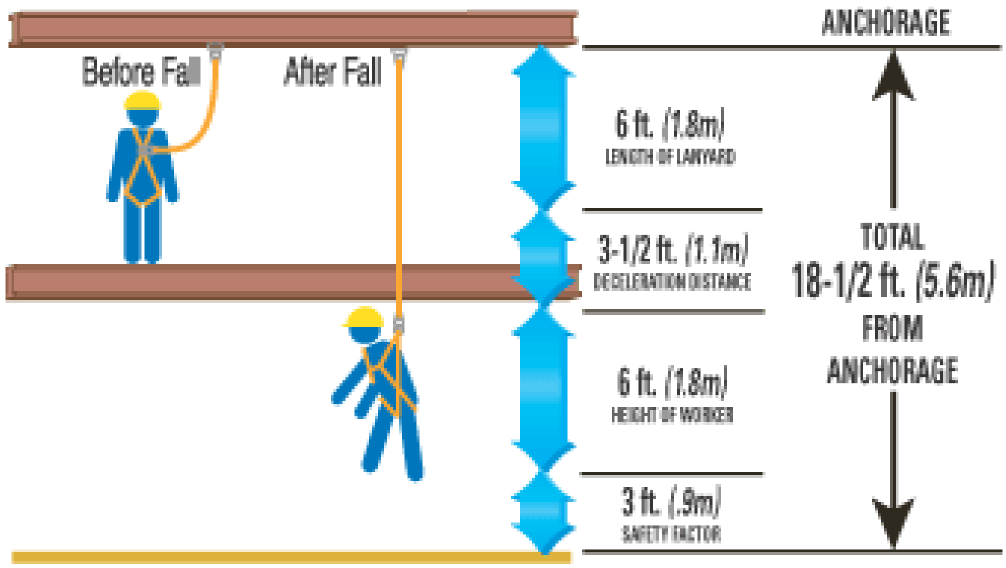
4.3.2.2. Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3½ feet (1.0 m).

4.3.2.3. Have sufficient strength to withstand twice the potential impact energy of an employee free fall a distance of 6 feet (1.8 m), or the free fall distance permitted by the system, whichever is less.

4.3.2.4. The fall arrest system must be rigged so that the wearer cannot free fall more than 6 feet (1.8 m) or contact any lower level. For example, a worker of average height using a 6-foot shock-absorbing lanyard must tie off at a point 18½ feet (5.6 m) from a lower level; for example:

- 6 feet (1.8 m): Height of worker
- 6 feet (1.8 m): Lanyard length
- 3½ feet (1.1 m): Maximum shock absorber extension
- 3 feet (0.9 m): Safety Factor
- 18 ½ feet (5.6 m): Maximum fall from anchor point

CALCULATING FALL CLEARANCE DISTANCE



4.3.2.5. To limit the free fall distance, the tie off point must be at or above the D-ring on the harness.

4.3.2.6. Shock-absorbing lanyards are required. The use of a body belt in a positioning device system is not acceptable.

4.3.2.7. Tie off lanyards to an appropriate anchor point capable of supporting at least 5,000 pounds (2,268 kg) per employee attached. Ladders are not an appropriate anchor point.

4.3.2.8. Do not tie knots in rope lanyards and lifelines; knots can reduce strength by 50 percent. Remember that a shock-absorbing lanyard will elongate before arresting a fall. The fall distance includes lanyard length (before the shock absorber extends), deceleration distance (shock-absorber extension), worker height, and a safety margin (allow 3 feet (0.9 m)).

4.3.2.9. Attach only compatible components together. A competent person must evaluate and approve any substitution or change in system components, e.g., a lanyard and harness made by different manufacturers. Testing may be required in such cases.

4.3.2.10. All components of personal fall arrest must be applied in accordance with manufacturer guidelines: **A**nchorage, **B**ody Harness and **C**onnection i.e. Lanyards cannot be connected to retractable life lines to gain additional access.

4.3.2.11. The competent person must approve use of personal fall arrest systems for employees who have a combined body and tool weight greater than 310 pounds (141 kg).

4.3.2.12. Workers using a fall arrest system or fall restraint system must:

- Not alter or modify it
- Use it only for its intended purpose
- Protect it from unnecessary wear and tear

- Visually check it prior to use
- Attach it to an approved anchor point
- Use snaphooks and carabiners that are automatic locking type and require at least two separate, consecutive movements to open
- Not engage a snap hook to a D-ring to which another connector is already attached unless specifically designed for this condition
- Ensure their weight, plus the weight of any equipment they carry, does not exceed the weight limits of the fall arrest or fall restraint system
- Report a fall and discard the harness and lanyard (Section 4.8.5)

4.4. Positioning Device Systems

4.4.1. Positioning device systems are fall restraint systems that are essentially designed like fall arrest systems. However, the following differences are important:

4.4.1.1. Connecting assemblies must be designed for work positioning, e.g. no shock absorbing lanyards.

4.4.1.2. Harnesses or belts must have side D-rings. Wearers cannot attach connecting assemblies to the back center D-ring for work positioning. The use of a body belt in a positioning device system is acceptable.

4.4.1.3. Positioning device systems must be rigged to limit the free fall to 2 feet (0.6 m) or less.

4.4.1.4. Positioning devices must be secured to an anchor point capable of supporting at least twice the potential impact load of an employee's fall or 3,000 lbs (1,361 kg), whichever is greater.

4.5. Fall Protection Equipment

4.5.1. All fall protection equipment must be designed specifically for fall protection and must meet all regulatory strength specifications. Ropes and straps (webbing), and strength components of harnesses must be made from synthetic fibers, e.g., nylon.

4.5.2. Equipment must be used according to the manufacturer's specifications. Equipment must be purchased from a qualified manufacturer and not manufactured or modified. Parsons site personnel are not allowed to use fall arrest equipment without proper training. Fall arrest equipment cannot be used to hoist materials or equipment.

4.5.3. Use the following guidelines to clean the fall protection equipment:

4.5.3.1. Wash synthetic rope and body harnesses in soapy water to remove dirt and rinse them with clean water.

4.5.3.2. Air-dry at room temperature.

4.5.3.3. Do not use cleaning solvents that can damage synthetic material.

4.5.3.4. Lubricants attract dirt: do not lubricate moving parts unless the manufacturer requires it.

4.5.3.5. Do not remove information labels or warnings and make sure they are still legible after cleaning.

4.5.3.6. Follow the manufacturer's instruction for storing equipment.

4.5.3.7. Store equipment in an area that is clean, dry, and moisture-free; avoid excessive heat, light, oil, and corrosive chemicals.

4.5.4. Harnesses

4.5.4.1. No employee will use a body belt for fall arrest. Only full-body harnesses are allowed.

4.5.4.2. The attachment point (i.e. D-ring) on a fall protection harness must be in the center of the wearer's back, between the shoulder blades.

4.5.5. Connectors

4.5.5.1. Connectors must have a smooth finish to prevent damage to interfacing parts.

4.5.5.2. Connectors must be corrosion resistant and made of formed steel or equivalent materials.

4.5.5.3. Snap hooks must be lockable. Nonlocking snap hooks are prohibited.

4.5.5.4. Unless so designed, snap hooks cannot be attached:

- Directly to webbing, rope or wire rope
- To each other
- To a D-ring to which another snap hook or other connector is attached
- To a horizontal lifeline

4.5.6. Lifelines

4.5.6.1. The PSHEM interfaces with the superintendent to determine proper performance requirements and considerations in the selection, location, and erection of semi-permanent horizontal lifelines. The superintendent coordinates acquisition and inspection and possible removal of lifelines.

- Horizontal and vertical lifelines are designed and installed under the supervision of a qualified person as part of a complete fall protection system that maintains a safety factor of at least two. Installed and used per manufacturer's instructions.
- Vertical lifelines must have a minimum breaking strength of 5,000 pounds (2,268 kg).
- Only one employee at a time may be tied off to a vertical lifeline.
- Vertical lifelines must be protected against cuts and abrasions.
- If retractable lifelines limit the free-fall distance to 2 feet (0.6 m) or less, they may be engineered to sustain 3,000 pounds (1,361 kg). If they do not limit the free fall distance to 2 feet (0.6 m), they must be able to sustain 5,000 pounds (2,268 kg).
- Horizontal lifelines that may become vertical lifelines must have connectors capable of locking in both directions on the lifeline.

- When erecting semi-permanent horizontal lifelines, consider the following:
  - Work area and location of energized electrical circuits.
  - Length of lifeline and span distances.
  - Can lifelines be erected on structural beams, on the ground, before installation?
  - How many employees will use the lifeline simultaneously?
  - Strength of anchorage points required.
  - How much sag in line is tolerable?
  - To keep lifeline located above the work surface a minimum of 42 inches (1.1 m), must an anchorage post be erected if no supporting steel is available?
  - Can lanyards be moved past support post or anchorage points without detaching snap hooks?

4.5.7. Safety Nets

4.5.7.1. Safety net systems must comply with the following provisions:

- Safety nets must be attached to an approved anchor point, installed as close as practicable under the walking/working surface on which employees are working, but in no case more than 30 feet (9.1 m) below that level.
- Safety nets must be installed and tested per manufacturer's instructions.
- Safety nets extend outward from the outermost projection of the work surface as follows:

Vertical distance (ft/m) from working level to horizontal plane of net	**Minimum horizontal distance (ft/m) to outer edge of net from edge of working surface**
≤ 5/1.5	8/2.4
> 5 to 10/> 1.5 to 3.0	10/3.0
> 10/3.0	13/4.0

- Safety nets require sufficient clearance under them to prevent contact with objects and the ground surface below when carrying an impact force.
- When nets are used on bridges, the potential fall area from the walking/working surface to the net must be unobstructed.
- Safety-net openings cannot be more than 6 inches on a side, center to center.
- The competent person conducts a drop test and inspects and approves the safety net systems initially and every 6 months thereafter.
- Workers using a safety net must:

- Inspect safety nets prior to use and remove debris from them no later than the start of the next work shift
- Report a fall.

4.5.8. Lanyards

4.5.8.1. All lanyards used for fall arrest systems must be equipped with a shock absorber.

4.5.8.2. Lanyards must have a minimum breaking strength of 5,000 pounds (2,268 kg).

4.5.8.3. Shock absorbing lanyards may not elongate more than 3½ feet (1.1 m).

4.5.8.4. The PSHEM interfaces with the superintendent to determine proper performance requirements and considerations in the selection of lanyards i.e. double-legged lanyards and tie-back lanyards

4.5.9. Anchor Points

4.5.9.1. Anchor points must be capable of supporting at least 5,000 pounds (2,268 kg) per employee attached, or they must be part of a fall protection system that maintains a safety factor of at least two and is designed and installed under the supervision of a qualified person. The anchor point must be inspected before reuse if involved in a fall.

4.5.9.2. Anchors for personal fall arrest equipment must be independent of any anchors used to support or suspend work platforms.

4.5.9.3. There must be an approved connection between the anchor and lanyard. Cinching a lanyard around an anchor point (connecting the lanyard to itself) is prohibited, unless the lanyard is designed to be used in this application per the manufacturer. Choker straps are used to tie off to structural members (I-beams or pipes).

4.5.9.4. Anchors are placed to restrict the free fall to 6 feet (1.8 m) or less and must not allow the person to strike a lower level.

4.5.9.5. Anchors must be located so that a person does not swing after a fall and strike an object.

4.5.9.6. Anchors must be reachable to permit connection without a hazard.

4.5.9.7. Some structures that have not been designed specifically for fall arrest systems may be suitable anchor points. A qualified person must assess the use of these makeshift anchor points. Scaffold components used as an anchor point must be approved by.

- The scaffold manufacturer, and
- A competent scaffold builder

Mobile anchor points (specifically designed by manufacturer for Fall Protection) must be:

- Approved by a Qualified Person
- Installed and used per manufacturer's instructions
- Checked by a Competent Person prior to use
- Must not have any other load suspended from the hook or load line

4.5.9.8. The following are NOT allowed as anchor points:

- Guardrails, unless they have been specifically designed as anchor points
- Cranes or hoists (requires Parsons BU President approval [Cranes, Hoists, and Lifts]. If approved for use, must not have any other load suspended from the hook or load line).
- Plastic pipe
- Electrical conduit
- Insulated pipe, unless approved by a competent person
- Wood trusses, unless approved by a qualified person
- Aluminum Pipe
- Plastic/Fiberglass Reinforced Pipe
- Fixed hoists unless allowed by manufacturer

4.6. Fall Prevention Systems

4.6.1. Warning Lines

4.6.1.1. The purpose of the warning line is to prevent falls by warning employees that they are near an unprotected edge.

- Employees performing roofing work between a roof edge and a warning line must be protected by a personal fall arrest system, personal fall restraint system, guardrail system, safety net system, or safety monitoring system.
- Employees performing roofing work on steep roof between a roof edge and a warning line must be protected by a personal fall arrest system, guardrail system, or safety net system.
- A work rule, if work is infrequent and temporary and does not involve construction work, access within 15 feet of the edge must be restricted.
- Do not store materials within 6 feet (1.8 m) of the roof edge unless guardrails are erected at the roof edge.
- Use warning line systems in conjunction with safety monitor systems under the following conditions:
  - During the performance of work on low-pitched roofs with a potential fall hazard greater than 10 feet (3.0 m)
  - The competent person must review and approve all warning line systems
  - Employees must be trained in the use of warning line systems used on the Parsons project site
- Erect warning lines around all sides of the work area under the following conditions:

- When mechanical equipment is not being used, erect the warning line at least 6 feet (1.8 m) from the edge of the roof.
- When mechanical equipment is being used, erect the warning line at least 6 feet (1.8 m) from the roof edge that is parallel to the direction of mechanical equipment operation, and at least 10 feet (3.0 m) from the roof edge that is perpendicular to the direction of mechanical equipment operation.
- The warning line consists of a barrier of rope, wire, chain, and/or highly visible caution or danger tape (visible from 25-feet) and a minimum breaking strength of 200 pounds. Plastic caution tape cannot be used for a warning line.
- Erect supporting stanchions with 16 pounds (7.2 kg) of horizontal resistance to prevent tipping.
- Flag the barrier with high-visibility material at no more than 6-foot intervals.
- Rig and support the barrier in such a way that its lowest point (including sag) is no less than 34 inches (0.9 m) from the walking/working surface and its highest point is no more than 39 inches (1.1 m) from the walking/working surface.

- Erect access paths as follows:
  - Connect points of access, materials handling areas, and storage areas to the work area by a clear access path formed by two warning lines.
  - When the path to a point of access is not in use, place a barrier equal in strength and height to the warning line across the path at the point where the path intersects the warning line erected around the work area.

4.6.2. Safety Monitoring System

4.6.2.1. Safety monitoring systems may be used in conjunction with additional systems as defined in this procedure and under the following conditions:

- A safety monitor system may be used in conjunction with a warning line system as a method of guarding against falls during work on low-pitched roofs and leading edge work.
- The safety monitor system is summarized in the fall protection plan, which is reviewed and approved by the competent person. The system includes the following provisions:
  - The safety monitor system is not used when adverse weather conditions create additional hazards.
  - A person acting in the capacity of safety monitor(s) must be trained in the function of both the safety monitor and warning lines systems and will:
    - Be a competent person
    - Have control authority over the work as it relates to fall protection
    - Be instantly distinguishable among members of the work crew
    - Engage in no other duties while acting as safety monitor

- Be positioned to have a clear, unobstructed view of, and be able to maintain normal voice communication with the workers under protection
- Not supervise more than eight exposed workers at one time
- Warn an employee when it appears that the employee is unaware of a fall hazard or is acting in an unsafe manner

4.6.3. Controlled Access Zones

4.6.3.1. Controlled access zones are allowed in conjunction with a warning line system and safety monitor system as a method of guarding against falls during work on low-pitched roofs and leading edge work.

4.6.3.2. Control zones are allowed for roofing work between the warning line and the unprotected edge.

4.6.3.3. Workers in the control zone are distinguished from other members of the crew by wearing highly visible, distinctive, and uniform apparel while in the control zone.

4.6.3.4. Supervisors ensure that employees working in a control zone comply with fall hazard warnings from safety monitors.

4.6.4. Slide Guards

4.6.4.1. A slide-guard system prevents workers from sliding down a sloped roof. The system consists of a slide guard (typically 2- x 6-inch lumber) and at least two roof brackets.

- Always use slide guard systems with another acceptable form of fall protection.
- Install slide guard systems under the supervision of a competent person.
- Slide guards cannot be the only form of fall protection on roofs with a ground-to-eave height greater than 25 feet (7.6 m).
- Slide guard specifications:
  - Do not use slide guards as a fall protection system on roofs with a slope less than 3:12 nor greater than 8:12.
  - On roofs with slopes greater than or equal to 3:12 up to and including 6:12, place at least one slide guard below the work area, no closer than 6 inches from the eave.
  - On roofs with slopes greater than 6:12 and no more than 8:12, use multiple slide guards and space them no closer than 6 inches from the eave.
  - Installation of the lowest slide guard must be perpendicular (90 degrees) to the roof surface. When using multiple slide guards, the angle of installation for the upper slide guards cannot be less than 60 degrees to the roof surface.
  - Slide guards must be continuous below all walking or working areas.
  - Personnel are not allowed to ascend or descend the roof slope within 6 feet of the rake edge except where that limitation would prevent the performance of work.

- Do not store supplies and materials within 6 feet of the rake edge, or 3 feet from where tile roof systems are being installed.

4.7. Alternative Methods

4.7.1. Alternative methods are the least acceptable option for protecting employees from falls. They are acceptable only if all of the following conditions are met:

4.7.1.1. Employees are engaged in leading edge work, precise concrete erection work, or residential construction work.

4.7.1.2. A qualified person must determine that providing a physical means of fall protection is not feasible or would create a greater hazard.

4.7.2. In addition to the above conditions, the following must be documented by a qualified person in the current fall protection plan:

4.7.2.1. Discuss other measures to be taken to reduce or eliminate the fall hazard.

4.7.2.2. Identify each location on the project site where conventional fall protection cannot be used (areas will be classified as control zones) and each employee who is designated to work in that zone. No other employees may enter control zones.

4.7.2.3. If no other measures have been taken, implement a safety monitoring system (as a minimum).

4.7.2.4. Document the changes in a current plan and approved by a qualified person.

4.7.3. Before considering alternative methods, consider whether construction methods can be modified to:

4.7.3.1. Use conventional fall-protection systems, aerial lifts, or scaffolding.

4.7.3.2. Eliminate or minimize exposure to fall hazards by the following methods:

- Perform construction work on the ground before lifting or tilting it to an elevated position.
- Install permanent stairs early in the project so that workers don't need to use ladders between floors.
- Use tool extensions to perform work from the ground.

4.7.4. Truss Installation

4.7.4.1. Develop methods of truss installation that minimize the risk of falling and train workers in those methods.

- Require employees to maintain three points of contact when moving point-to-point in the trusses, i.e., one hand and both feet, or one foot and both hands, in contact with truss members.
- Adequately brace trusses and rafters before employees stand on them or use them for support.

- Require employees working at the peaks or in the webs of trusses, or on top of the ridge beam or interior top plates, to work from a stable position such as locking one leg around a truss member.
- Place a plank on the bottom cord of the trusses for employees to stand on while working.
- Position an employee at each end of the truss, eliminating the need for one to travel the length of the truss to attach bracing.

4.7.5. Life Critical Guards and Safety Attendants

4.7.5.1 If any work creates a fall hazard, the work must be performed by one or more of the following protection methods in preferred order:

- Life Critical Guards
  - Must be constructed to be strong enough to support the weight placed against it or upon it, or
  - That prevent other workers from accessing the area by placing the Life Critical Guard at least six (6) feet (1.8m) away from the fall hazard on all sides
  - Approved by the Project Manager
  - Approved by the Corporate EH&S Director after thirty (30) days
  - Labelled on all sides
  - Inspected at least every seven (7) days to confirm:
    - ➢ Physical condition and integrity
    - ➢ It is still needed
    - ➢ Labels are in place and legible
- Safety Attendant that must:
  - Be in continuous attendance once the hazard is created for a maximum of two (2) hours
  - Prevent entry into the fall hazard area from all possible accessible sides
  - Be replaced with Life Critical Guards or permanent physical guards or barricades

4.7.6. Catch Platforms

4.7.6.1. Properly constructed, catch platforms are acceptable roofing fall protection when other methods are not feasible.

- The platform cannot be more than 18 inches (0.5 m) below the eave line of the roof.
- The platform must extend horizontally at least 2 feet (0.6 m) beyond eave line of the roof.

- A catch platform must be installed within 10 vertical feet (3.0 m) of the work area.
- The catch platforms width must equal the distance of the fall but must be a minimum of 45 inches (1.1 m) wide.
- The platform must have a standard guardrail and toeboard on all open sides. The top guardrail must rise substantially (at least 12 inches (0.3 m)) above the eave line of the roof.

4.8. Inspection and Testing

4.8.1. Employees inspect fall protection equipment before each use using the Fall Protection Equipment Inspection Form (Exhibit 8.1) as a guide. Inspections of fall protection equipment must be logged weekly. Defective equipment must be removed from service and tagged or destroyed.

4.8.2. The competent person conducts inspections periodically and maintains a log of completed inspection forms. The competent person inspects personal fall protection equipment at least quarterly.

4.8.3. The competent person must ensure that all fall protection equipment has been tested by the manufacturer. Subcontractors must ensure that only tested equipment is brought on site.

4.8.4. If a subcontractor wishes to use another crew's scaffolds, ladders, anchor points, nets, slide guards, or warning lines, the subcontractor's competent person must obtain permission for use and must inspect the equipment before use.

4.8.5. If fall arrest equipment is subjected to an actual employee fall, take it out of service and do not use it again for employee protection.

4.9. Rescue Arrangements

4.9.1. Means of rescue must be determined in the project fall protection plan. Employees who use fall arrest systems must be able to rescue themselves, or arrangements must be made for prompt rescue services. Rescue service options include aerial lifts and scissor lifts.

4.10. Training

4.10.1. Provisions for training each employee who might be exposed to fall hazards is included in the project fall protection plan. The training instructs each employee in the hazards of falling and in procedures to minimize those hazards in accordance with federal and state regulations.

4.10.2. The PSHEM arranges employee training at the time of initial assignment, annually, and when a new hazard is introduced to the jobsite. This training can be organized and presented to groups or on a work area by work area basis, depending on the operation.

4.10.3. The qualified person annually evaluates competent persons on fall protection requirements using the Competent Person Assessment Checklist (Exhibit 8.2).

4.10.4. Supervisors address and communicate appropriate hazards, controls, and work practices at daily huddles before beginning work. Supervisors are responsible for identifying training needs during risk mitigation planning (2-week look-ahead) in accordance with the ESHARP Guidebook, Volumes I & II.

4.10.5. Employees must be retrained when they do not recognize fall hazards, when they do not follow safe practices for using fall-protection systems, and when changes in the workplace or in the fall-protection systems make previous training obsolete.

4.10.6. Using an acceptable training form, the records custodian maintains a record of all training or instruction given to employees.

4.10.7. Subcontractors must train their employees to recognize fall hazards and protect themselves in accordance with the subcontractor's fall protection plan. The trainer must be a competent person who understands the fall hazards and site- or trade- specific fall protection.

4.11. Documentation

4.11.1. The records custodian documents all instruction, training, and retraining records.

4.11.2. The superintendent retains the manufacturer's certification papers for wire rope or saddle clamps for lifelines.

4.11.3. The PSHEM maintains the fall protection plan records at the site for the duration of the project and archives them at project close.

5. Definitions

Term	Definition
100% Fall Protection	The design and use of a fall protection system so that no exposure to an elevated fall occurs at any time. This may require more than one fall protection system, lanyard, or combination of preventive or protective measures.
Anchor Point	A secure point of attachment for lifelines, lanyards, or deceleration devices that is capable of withstanding forces specified for anchor points.
Body Belt (Safety Belt)	A strap with means both to secure it about the waist and to attach it to a lanyard, lifeline, or deceleration device. The use of a body belt as part of a personal fall arrest system or positioning system is prohibited
Body Harness	Straps that may be secured about the employee in a manner that distributes the fall arrest forces over at least the thighs, pelvis, waist, chest, and withers with means to attach it to other components of a personal fall arrest system.
CFR	Code of Federal Regulations
Competent Person	An individual who has successfully completed Grating Inspection and/or Fall Protection Training for the Competent Person and has the authority to take prompt corrective action based on the training.
Connector	A device that is used to connect parts of the personal fall arrest system to the anchorage system (e.g., carabiner, buckle, D-ring, and snap hook).
Corporate Safety	Includes, but is not limited to: Senior Vice President – Safety, Health, Environment and Sustainability; Vice President – Safety, Health and Environment (SH&E); and SH&E Director.

Term	Definition
Deceleration Device	Any mechanism (e.g., a rope grab, rip stitch lanyard, or automatic self-retracting lanyard) that dissipates a substantial amount of energy during a fall arrest or otherwise limits the maximum arresting energy imposed on a person during fall arrest.
EM	Engineering Manual
Fall Arrest System	The use of multiple, approved safety equipment components (e.g., full-body harnesses, lanyards, deceleration devices, and anchor points) rigged in a way to successfully arrest a fall.
Fall Restraint System	An approved device with necessary components to prevent an employee from falling to a lower level (e.g., guardrails).
Free Fall	The act of falling before a fall arrest system begins to apply force to arrest the fall.
Free Fall Distance	The vertical displacement of the fall arrest attachment point on the employee's body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance and lifeline/lanyard elongation, but it includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.
Guardrail System	A barrier erected to prevent employees from falling to lower levels.
Horizontal Lifeline	A rope, wire, or synthetic cable that is installed in a horizontal plane between two anchorage points and is used as an anchor point for personal fall arrest systems.
Infeasible	Not possible; that is, it is impossible to perform the construction work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or it is technologically impossible to use any one of these systems to provide fall protection.
Lanyard	A flexible line of webbing, rope, or cable used to secure a full-body harness to an anchor point. Lanyards are usually 2 ft (0.6 m), 4 ft (1.2 m), or 6 ft (1.8 m) long.
Leading Edge	The edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) that changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.
Lifeline	The component that consists of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and that serves as a means for connecting other components of a personal fall arrest system to the anchorage.
Locking Snap Hook	A snap hook that requires two separate forces to open the gate: one to deactivate the gatekeeper and a second to depress and open the gate, which automatically closes when the hook is released. Locking snap hooks are used to minimize roll-out or accidental disengagement.
Lower Levels	Areas or surfaces to which an employee can fall, including ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, and structures (or portions thereof).
Low Pitched Roofs	Roof slopes (vertical to horizontal) greater than 4:12.

Term	Definition
Opening	A gap or void > 30 inches (> 76 cm) high and > 18 inches (> 48 cm) wide in a wall or partition, through which employees can fall to a lower level.
Personal Fall Arrest System	The system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, and body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations thereof.
Positioning Device System	A body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface such as a wall and work with both hands free while leaning.
Qualified Person	A person with a recognized degree or professional certificate with extensive experience in the field of fall protection and arrest systems (e.g., an engineer or representative from a company specializing in fall protection).
Restraint Line	The line from a fixed anchorage or between two anchorages to which an employee is secured in such a way to prevent him from falling to a lower level.
Retractable Lifeline	A deceleration device that contains a drum-wound line that may be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement and that, after the onset of a fall, automatically locks the drum and arrests the fall.
Rope Grab	A deceleration device that travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest the fall of an employee.
Roof	The exterior surface on the top of a building. The roof does not include floors or formwork which, because a building has not been completed, temporarily becomes the top surface of a building.
Roofing Work	The hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.
Safety-Monitoring System	A safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.
Self-Retracting Lifeline/Lanyard	The deceleration device containing a drum-wound line that can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and that, after onset of a fall, automatically locks the drum and arrests the fall.
Steep Roof	A roof having a slope greater than 4:12 (vertical to horizontal).
Toeboard	A low protective barrier that prevents the fall of materials and equipment to lower levels and protects personnel from falls.
Unprotected Sides and Edges	Any side or edge (except at entrances to points of access) of a walking/working surface (e.g., floor, roof, ramp, or runway) where there is no wall or guardrail system at least 39 inches (1.0 m) high.
Walking/Working Surface	Any surface, horizontal or vertical, on which an employee walks or works, including floors, roofs, ramps, bridges, runways, formwork, beams, columns, trusses, and concrete reinforcing steel. Walking/working surfaces do not include ladders, vehicles, or trailers on which employees must be located in order to perform job duties.

Term	Definition
Warning Line System	A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and that designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.

6. Responsibilities

6.1. Corporate Safety: Responsible for developing and maintaining this procedure and conducting periodic reviews and updates to ensure alignment and integration with related or referenced policies and procedure; coordinating reviews by individuals and organizations responsible for and supported by implementation, including resolution of comments received; develops training materials, forms, and templates necessary to implement the procedure; and providing safety subject matter expertise and guidance to help ensure the success and effectiveness of this procedure.

6.2. Project Manager (PM): Ultimately responsible for delivering the project and assigning roles and responsibilities to discipline managers and the Project Management Team; hold overall responsibility for this procedure; review, approve, and assist in implementing the project fall protection plan; incorporate fall protection into project planning; provide the necessary personnel, facilities, and other resources; and designate competent persons to conduct project fall protection plan activities.

6.3. Records Custodian: Responsible for documenting employee training and serving as records custodian, maintaining and archiving related documentation.

6.4. Superintendent: Responsible for facilitating compliance with and enforcement of this procedure.

6.5. Project Safety Health and Environmental Manager (PSHEM): Responsible for developing, monitoring and assisting in the implementation of this procedure on the jobsite; conducting orientations for subcontractors and new employees; and determining training needs and coordinating training for affected employees; providing the regulatory expertise to ensure that activities are conducted in compliance with the applicable codes, standards, and regulations; and ensuring that AHAs are performed.

6.6. Qualified Person: Supervise design, installation, and use of horizontal lifeline systems, personal fall-restraint anchorages, and alternative methods; document justification for alternative methods; and oversee and evaluate competent persons.

6.7. Competent Person(s): Lead development and implementation of the project fall protection plan; update, oversee, and monitor compliance with the project fall protection plan; conduct employee training; select fall protection systems; inspect fall protection systems and equipment; review, approve, and implement fall prevention systems; serve as the monitor in safety-monitoring systems; and evaluate non-compatible components; and supervise implementation of alternative methods, where used.

6.8. Foreman/Supervisor: Continuously monitor the work to ensure compliance with this procedure; confirm that jobs are properly evaluated for fall hazards and that hazards are properly eliminated or controlled; review fall hazards and controls with employees during daily huddles; and ensure that employees adhere to the project fall protection plan.

6.9. Employees: Responsible for complying with the requirements of this procedure.

6.10. **Subcontractors:** Responsible for complying with all Parsons' requirements; and training their own employees in applicable Parsons' procedures.

7. Exceptions

7.1. The PM may request or require a more stringent process if required by the contract or is beneficial to the project.

8. Exhibits

8.1. Fall Protection Equipment Inspection Form

8.2. Competent Person Assessment Checklist

9. Revision History

Revision	Changes	Approver	Approval Date
2	Modified 4.1.2, 4.2.1, 4.5.6.1, 4.5.7.1, 4.5.9.1, 4.5.9.7, 4.5.9.8, 4.6.1.1, Competent Person Definition. Added 4.2.6.6 - 4.2.6.12, 4.3.2.12, 4.7.5, Corporate Safety Definition.	Beck, Gregory	4/2/2019
1	Added 4.2.6.1 and 4.2.6.16. Inserted measurements in meters and kilograms	Beck, Gregory	6/25/2018
0	Original Issue	Barber, Brad	2/22/2016

Exhibit 8.1: Fall Protection Equipment Inspection Form

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

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Description of Item	
Serial Number	
Model	
Manufacture Date	

Inspection Date	Deficiencies	Corrective Action	Maintenance Performed
Approved By:			
Inspection Date	Deficiencies	Corrective Action	Maintenance Performed
Approved By:			
Inspection Date	Deficiencies	Corrective Action	Maintenance Performed
Approved By:			
Inspection Date	Deficiencies	Corrective Action	Maintenance Performed
Approved By:			

Fall Protection Equipment Inspection Form

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FALL PROTECTION INSPECTION INSTRUCTIONS

Each time you use a personal fall-arrest, restraint, or positioning-device system, inspect the components for damage, missing parts, or excessive wear. Labels, warnings, and other instructions should be readable. Check the manufacturer's labels for additional inspection points.

If equipment looks like it needs repair, remove it from service and have a competent person examine it. Do not use a personal fall-arrest system that has arrested a fall unless a competent person has determined that the system is safe to use.

Harness, Lifeline, and Anchorage Components

- See Harness Inspection Steps (page 3)
- Harness webbing: Frayed edges, broken fibers, pulled stitches, cuts, burns and chemical damage
- Harness D-rings: Cracks, breaks, and rough or sharp edges; the D-ring should pivot easily
- Harness buckles: Excessive wear, frayed or cut fibers, broken stitching
- Harness grommets: Loose, bent, or broken grommets, and punched holes not made by the manufacturer
- See Lifeline Inspection Steps (page 3)
- Lifelines: Wear or deterioration
- Anchorages and anchorage connectors: Look for abrasion and damaged threads or swages. Inspect stitching and loops on synthetic slings for cuts, cracks, or frayed and broken stitching. Look for excessive kinks or damaged steel fibers

Lanyards

- Wire rope lanyard: Cuts, frayed strands, or excessive wear
- Web lanyard: Cuts, discoloration, cracks, frayed or broken stitching
- Rope lanyard: Frayed or cut fibers. The entire length of the rope should have the same diameter.
- Shock-absorbing lanyard: Cuts, discoloration, cracks, frayed or broken stitching. Remove a lanyard from service if any part of the warning label is exposed.

Snaphooks

Look for cracks, excessive wear, and corrosion. The snaphooks should open easily and close firmly. Keeper locks must prevent the keeper from opening when it is closed.

Self-Retracting Lifelines

Look for cuts, frayed strands, or excessive wear in the line and damage to the housing. If the unit needs service, check the manufacturer's recommendations. Do not try to repair it yourself.

Guardrail Systems

Frequently inspect manila, plastic, or synthetic rope used for top rails or midrails to ensure that the rope meets the minimum strength and rail height requirements.

Safety Net Systems

Inspect safety nets for damage or deterioration weekly and after any event that could damage them. Remove defective components from service.

Fall Protection Equipment Inspection Form

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HARNESS INSPECTION STEPS

Step 1 Inspect harness hardware (buckles, D-rings, back pad, loop keepers). These items must not be damaged, broken, or distorted, and must be free of sharp edges, burrs, cracks, worn parts, or corrosion. To ensure non-conductivity, PVC-coated hardware must be free of cuts, rips, tears, holes, etc., in the coating. Ensure that buckles work freely. Inspect parachute buckle spring.

Step 2 Inspect webbing. Material must be free of frayed, cut, or broken fibers. Check for tears, abrasions, mold, burns, or discoloration. Inspect stitching. Check for pulled or cut stitches. Broken stitches may be an indication that the harness has been impact loaded and must be removed from service.

Step 3 Inspect labels. All labels should be present and fully legible.

Step 4 Inspect each system component or subsystem according to manufacturer's instructions.

Step 5 Record the inspection date and results in the inspection and maintenance log.

NOTE: Only manufacturers and dealers authorized in writing may make repairs to equipment.

LIFELINE INSPECTION STEPS

Step 1 Inspect the turnbuckle for damage. Ensure that sufficient threads are engaged into the turnbuckle body. Look for any cracks or deformities in the metal. Inspect metal components for rust or corrosion that may affect their strength or operation.

Step 2 Inspect the wire rope for rust, corrosion, broken wires, or other obvious faults. Inspect for proper tension. Inspect all hardware (fasteners, shackles, wire rope cable clips, etc.) securing the assembly to ensure they are present and properly installed.

Step 3 Inspect the energy absorber for extension or deformities. Inspect securing hardware for strength and function.

Step 4 Inspect system labels. The labels must be present and fully legible. Replace labels if missing or illegible.

NOTE: If this equipment is subjected to the forces of a fall arrest, it must be removed from service until the competent person authorizes the reemployment of the system.

Exhibit 8.2: Competent Person Assessment Checklist

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

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Project:	
Competent Person Name:	
Evaluator Name:	
Date:	

Question	Response	(+)	(-)
When is fall protection required?	• When work or travel at an elevation of 6 ft or higher above the surrounding work level.	☐	☐
	• At the edge of excavations greater than 6 ft in depth where excavations are not readily seen because of plant growth or other visual barrier, or that require employees to enter and be on the vertical wall of the excavation, on the protective system or on any other structure in the excavation	☐	☐
	• On accessways or work platforms over water, machinery, or dangerous operations	☐	☐
	• On runways from which they may fall 4 ft (1.2 m) or more	☐	☐
When is a fall protection plan required?	• A fall protection plan is required when ever employees are exposed to a fall hazard.	☐	☐
How often does the fall protection plan need to be updated?	• The plan must be updated when systems or controls or conditions change.	☐	☐
Who is responsible for initiating and maintaining the fall protection Plan?	• The competent person is responsible for the plan.	☐	☐
Where is the plan kept?	• The plan must be on site and available to employees using fall protection equipment or where the hazard exists.	☐	☐
What is a primary fall protection system?	• A permanently installed feature of a building or equipment that provides a waling/working surfaces free from floor openings and equipped with standard guardrail systems.	☐	☐
What are the general requirements for a guardrail system?	• A top rail (2 x 4 in.) lumber or equivalent 42 in. above the ground	☐	☐
	• A midrail at approximately 21 in. above ground.	☐	☐
	• No more than 8 ft spacing between upright supports	☐	☐
	• Must be able to support 200 lb of lateral force without major deflection	☐	☐
What is a secondary fall protection system?	• Systems that are temporary and are used as a backup to primary systems or in the absence of primary systems	☐	☐
What are the minimum requirements for attachment points?	• Capable of supporting 5,000 lb impact loading – OR –	☐	☐
	• When used with systems that allow a fall of 2 ft or less, 3,000 lb impact loading.	☐	☐

Competent Person Assessment Checklist

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Question	Response	(+)	(-)
What are the minimum requirements for attachment points for lifeline systems?	• 5,000 lb per employee.	☐	☐
When do personnel working from ladders require the use of fall protection?	• When they are ≥ 6 ft AND: • Outside of the confines of the ladder • Work requires force that could cause loss of balance	☐ ☐ ☐	☐ ☐ ☐
What is the minimum number of cable clamps for lifeline systems?	• Three	☐	☐
What is the torque requirement for a ⅜-in. clamp? A ½-in. clamp?	• 45 ft-lb; 65 ft-lb respectively	☐	☐
What is the maximum span between anchorage points?	• 50 ft	☐	☐
When do lifelines require inspection?	• Before use • Weekly (logged)	☐ ☐	☐ ☐
Give 5 examples of what the competent person is inspecting a lifeline for during the daily/weekly inspection.	• Bird caging • Broken wires • Cord protrusion • Ends are taped, excess is rolled up and out of the way • Gaps or excessive clearance between stands • Heat damage, torch burns, and electric are strikes • Kinks • Platting • Sag and tension of lifeline • Softeners are in place • Worn or abraded wires	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Who and how often are harnesses to be inspected?	• Employee/daily and at least each quarter by the competent person.	☐	☐
What is the maximum free-fall distance allowed?	• 6 ft	☐	☐
What are the key components required to be inspected on a harness?	• Buckles • D-ring snaps • Rivets and grommets are tightly embedded • Thimbles or wear pads • Webbing materials	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
List three of the six fall protection systems.	• Catch platform • Fall arrest • Fall restraint • Guardrails • Safety Monitor • Warning line	☐ ☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐

Competent Person Assessment Checklist

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Question	Response	(+)	(-)
What are the requirements for inspection of self-retracting life lines?	• Before use by inspecting the hook and swivel to see if the device has "seen "a fall load. • Checking the braking mechanism. • And annually if required by the manufacture as noted on the equipment tag	☐ ☐ ☐	☐ ☐ ☐
When using self-retracting life lines, what are the primary and secondary hazards that must be considered?	• Position of the retractable overhead to the work performed minimizing the hazard of swinging into a hazardous situation separate from the direct fall	☐	☐
What are the acceptable device(s) to attach self-retracting lifelines to anchor points? What is the minimum safety factor for this hardware?	• All hardware must have a rating and a safety factor of at least five times the load. Examples: Shackles with clevis pins, positive lock "Beaner"	☐	☐
What is the minimum fall distance in feet for an employee who falls wearing a harness with a 6-ft soft shock lanyard?	• Total fall is at least 11 ft: 6 ft for the lanyard and 5 ft to the D-ring.	☐	☐
What is the single limiting physical factor for employees using fall systems?	• Weight. Most harnesses are only rated for 325 lb or less. The same with retractable.	☐	☐
When using horizontal life lines, what two critical factors must be considered?	• The number of employees using the line and the stretch or total fall distance.	☐	☐
When designing a fall protection plan, other than the controls, what is the most important component of the plan?	• Means and methods to rescue an employee who falls.	☐	☐
What is the maximum time an employee can hang in a harness without suffering life-threatening injuries?	• No more than 15 minutes.	☐	☐
Whom must you call when a fall occurs and self-rescue is not employed?	• Call 911: the employee may need medical treatment as a result of hanging in his harness or from injuries from the fall.	☐	☐

1. Purpose

This procedure describes the process, tools, roles, and responsibilities for providing guidelines to inform employees of potentially hazardous chemicals used on Parsons' projects.

2. Scope

2.1. This procedure applies to Parsons Corporation and all Parsons' businesses and subsidiaries worldwide, including joint ventures and similar partnerships managed by Parsons.

2.2. The goal of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) is to identify the intrinsic hazards found in chemical substances and mixtures, and to convey information about these hazards. Information on the Workplace Hazardous Materials Information System (WHMIS 2015) is also included.

2.3. This element does not address storage and handling of hazardous materials, which are covered in the Hazardous Waste Operations Procedure. This element does not address the hazards of exposure to exhaust byproducts from diesel engines, or materials designated as waste or emissions from waste. Further, this element does not apply to the following substances:

- Agricultural products or vegetable seed treated with pesticides
- Alcoholic beverages
- Articles not modified (whole components, such as screws to be plated)
- Biological hazards (first aid waste)
- Chemicals or mixtures regulated by the Toxic Substances Control Act (TSCA) (polychlorinated biphenyls [PCBs])
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) hazardous substances being remediated
- Consumer products as defined in the *Canada Consumer Product Safety Act*
- Consumer products (e.g., white out, spray paint) used at work where exposure is no more than consumer use.
- Cosmetic, device, drug or food as defined in the *Food and Drugs Act*
- Drugs in retail packaging and in packaging designed for personal consumption
- Dust, if not hazardous
- Explosives as defined in the *Explosives Act* (WHMIS)
- Food and food ingredients
- Hazardous waste being a hazardous product that is sold for recycling or recovery and is intended for disposal
- Manufactured articles
- Nuclear substances within the meaning of the *Nuclear Safety and Control Act*, that are radioactive
- Personal food consumed at work
- Pest control products as defined in the *Pest Control Products Act*
- Pesticides – NOTE: Some states may only allow the application of pesticides (i.e. wasp spray, Raid™, etc) for commercial use by a licensed/certified individual. Check your local/city and state/provincial regulations for non-private or non-residential use.
- Radiation

- Retail food or alcohol
- Tobacco and tobacco products as defined in the *Tobacco Act*
- Wood or products made of wood

3. References

3.1. 29 CFR 1910.1200 – Hazard Communication (General Industry)

3.2. 29 CFR 1926.59 – Hazard Communication (Construction)

3.3. *Parsons ESHARP Guidebook,* Volumes 1 & 2

3.4. Hazardous Waste Operations Procedure

3.5. Globally Harmonization System of Classification and Labelling of Chemicals (GHS) – "Purple Book"

3.6. Workplace Hazardous Materials Information System (WHMIS)

4. Procedures

4.1. Hazard Communication Plan

4.1.1. The Project Safety, Health, and Environmental (SH&E) Representative leads the development and implementation of a project-specific hazard communication plan in accordance with state and local regulations and this procedure. The Project Manager (PM) reviews and approves the plan. The PM facilitates implementation and compliance with the program, designating personnel to conduct the inventory and maintain Safety Data Sheets (SDS) and labels.

4.1.2. The Project Hazard Communication Plan is included in the Project Safety, Health, and Environmental Plan (PSHEP) in accordance with Parsons ESHARP Guidebook, Volume 1. A sample Project Hazard Communication Plan is provided as Exhibit 8.1. It is a template only and must be modified to address specific project sites.

4.1.3. Each Office Safety, Health and Environmental Plan (OSHEP) must also contain information on a hazard communication plan. The Canadian OSHEP template contains information on WHMIS, which is also posted on Sharepoint (Exhibit 8.2).

4.1.4. The Project SH&E Representative audits the activities of Parsons' employees and subcontractors to ensure compliance with the plan. At a minimum, the project hazard communication plan must include the following information:

- Name of the person responsible for maintaining the program, and communicating program requirements to employees
- Name(s) of the personnel assigned responsibility for conducting activities within the program (e.g., training employees, conducting an inventory, labeling containers, and maintaining SDSs)
- Inventory of hazardous substances located on the project site
- Locations of, and access to, SDSs
- Outline of methods to be used for:
  - Labeling and other forms of warning
  - SDSs

- Training employees and visitors
- Subcontractor hazard communication
- Non-routine tasks

4.2. Multi-Employer Worksites

4.2.1. Where employees must travel between work places during a work shift (multi job sites), the written program may be kept at a primary job site. If there is no primary, then the program will be sent with employees.

4.2.2. For worksites occupied by employees of more than one employer, the requirement for the exchange of information is limited to those situations in which other contractors' employees may be exposed. It does not relieve contractors from maintaining their own hazard communication programs. This effort helps to ensure that all employees have sufficient information to protect themselves in the workplace, regardless of which contractor uses the hazardous chemical.

4.2.3. During the pre-job safety orientation, the Project SH&E Representative and superintendent review the project hazard communication plan with each subcontractor's safety representative concerning hazardous chemicals at job sites, methods of providing SDS sheets, methods of precautionary measures to be taken and methods of providing information on labeling systems. A copy of the chemical inventory must be furnished to the subcontractors' safety representative upon request.

4.2.4. The Contractor submits to the Project SH&E Representative copies of its hazard communication program and any SDSs for chemicals to be brought onto the project site. The project subcontract manager provides comments to the subcontractor.

4.3. Hazardous Substance Inventory

4.3.1. Where Parsons operates on client sites, the Project SH&E Representative requests a copy of the hazardous substance inventory from the client.

4.3.2. If a current hazardous substance inventory is not available, the designated person coordinates with Parsons' superintendent to conduct a complete physical inventory at the beginning of the project, and quarterly thereafter, of all products (liquids, solids, powders, pastes, gases). The Project SH&E Representative assists, as necessary.

4.3.3. The Project SH&E Representative (or designee) records each product on the Hazardous Substance Inventory Sheet (see Exhibit 8.3), forwards all completed inventory sheets for current and future products to the Project SH&E Representative, and maintains the sheets on file until completion of the project. Each chemical on the list should have the same name as shown on its corresponding Safety Data Sheet (SDS).

4.3.4. Parsons superintendent and the designated person conduct the inventory using a wall-to-wall system for collecting all products for inclusion on the list. Foremen assist the designated person by submitting a list of hazardous substances used by their employees. Review process flow diagrams, if necessary. Unless all materials are included in this list, some hazardous substances might be overlooked.

- Include products in small quantities or in small containers. Small quantities of materials are frequently more hazardous than larger quantities because of the risk of their being overlooked and their potential hazards thus being disregarded.

- Include welding rods, grinding wheels, compressed gases, paints, epoxies, glues, and mixtures.
- Do not include materials exempt from the hazard communication procedure identified in Section 2.3 above.

4.3.5. Include the approximate quantities (e.g., liters, kilograms, gallons, pounds) for each product that will be on site at any given time.

4.3.6. Attach a site map to the inventory showing where inventoried hazardous substances are stored.

4.3.7. Include a list of all products from the inventory at the front of the SDS binder as an index for locating an SDS. The list must include the SDS number assigned for location in the binder, the product name, manufacturer, and status of the SDS on file. The list must also include any common name that employees use for the product.

4.4. Hazard Classification

4.4.1. It is recommended that the person responsible for GHS implementation consult the Canadian OSHEP template or GHS Document (e.g., "Purple Book") for more complete information.

4.4.2. Physical Hazard - based on the physical or chemical properties of the product - such as flammability, reactivity, or corrosivity to metals. The GHS physical hazard criteria apply to mixtures. It is assumed that mixtures will be tested for physical hazards. In developing GHS criteria for physical hazards, it was necessary to define physical states.

- Gas - a substance or mixture which at 50°C has a vapor pressure greater than 300 kPa; or is completely gaseous at 20°C and a standard pressure of 101.3 kPa.
- Liquid - a substance or mixture that is not a gas and which has a melting point or initial melting point of 20°C or less at standard pressure of 101.3 kPa.
- Solid - a substance or mixture that does not meet the definitions of a liquid or a gas.

4.4.3. Health Hazard - based on the ability of the product to cause a health effect – such as eye irritation, respiratory sensitization (may cause allergy or asthma symptoms or breathing difficulties if inhaled), or carcinogenicity (may cause cancer).

4.4.4. Environmental Hazard – hazardous to the Aquatic Environment. Environmental hazards group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs).

4.5. Safety Data Sheets

4.5.1. Chemical manufacturers are responsible for developing SDSs. An SDS shall be available for each chemical used, stored or handled at a workplace.

- The Project SH&E Representative ensures that an SDS is available for each hazardous substance on the inventory. The designated personnel compile and update the SDSs.
  - Project SH&E Representative: Request SDSs for products on the hazardous substance inventory for which no SDS is on hand. Fax and mail a Manufacturer SDS Request Letter (see Exhibit 8.4) to the manufacturer/supplier. Keep a dated copy of this request in the project file. If a project employee has a telephone conversation with a manufacturer or supplier, he must record the conversation as a dated memo and include at the memo in the project file.

- Employees or subcontractors purchasing or receiving products: Submit SDSs to the Project SH&E Representative.
- Project SH&E Representative: Review each SDS to ensure that all information is provided. The names of substances listed on the SDS must be the same as those printed on container labels and on the hazardous substance inventory. The SDS must be specific to the substances provided by suppliers rather than representative or generic.

4.5.2. Evaluate SDSs

- The Project SH&E Representative evaluates each new SDS to ascertain whether products present an acceptable hazard, unacceptable hazard, or need further assessment. This assessment includes the following tasks:
  - Identify the chemical components, potential hazards, and recommended controls.
  - Evaluate hazard(s) identification and classification for any carcinogens or chemicals warranting further assessment.
  - Identify recommended controls and consider their inclusion in an Activity Hazard Analysis (AHA).
  - Investigate equivalent substitute materials with fewer or less serious hazards.
- If the hazard is unacceptable, the Project SH&E Representative works with the requestor to find an alternative, less hazardous chemical product.
- If the hazard needs further assessment, the Project SH&E Representative contacts Corporate Safety.

4.5.3. SDS Employee Access

- SDSs shall be maintained and readily accessible in each work area. SDSs can be maintained at the primary work site. However, they should be available in case of an emergency. SDS must be made available, upon request, to employees, their designated representatives, and regulators.
- A reasonable method must allow an employee, subcontractor, collective bargaining representative, or the employee's physician to access the SDS without interruption of normal work operations. Such methods could include:
  - Electronic system: Internet or intranet
  - SDS binder: Locate hard copies of updated, applicable SDSs in employee-accessible areas
  - SDS request system: The Project SH&E Representative provides a copy of the SDS for each product requested on the Employee SDS Request Form (Exhibit 8.4)

4.6. Non-Routine Tasks

4.6.1. Priority is given to conducting AHAs for non-routine tasks. Examples of non-routine tasks are cleaning reactor vessels, performing maintenance, and working on unlabeled piping systems. AHAs identify and address chemical safety issues, including employee exposure, storage, and use. The Project SH&E Representative ensures that an SDS is available for all products identified in AHAs.

4.7. Testing

4.7.1. Test data already generated for the classification of chemicals under existing systems should be accepted when classifying these chemicals under the GHS, thereby avoiding duplicative testing and the unnecessary use of test animals.

4.7.2. The GHS criteria for determining health and environmental hazards are test method neutral, allowing different approaches as long as they are scientifically sound and validated according to international procedures and criteria already referred to in existing systems.

4.8. Labeling

4.8.1. The project hazard communication plan defines the method for labeling each container of hazardous material on the project. The plan designates an employee responsible for labeling all containers as detailed below.

4.8.2. Review all containers of products on the hazardous substance inventory to ensure that the containers are properly labeled in accordance with Section 4.8.4 below. If a label applied to a hazardous product or a container of a hazardous product becomes illegible or is removed, it shall be replaced with either a supplier label or a workplace label (e.g., create one from the information on the SDS). Local safety equipment vendors may supply labels.

4.8.3. If hazardous materials are received at the project without proper labels, set them aside; do not distribute them for use until they are properly labeled. If an unlabeled container is found in the workplace, test and label it accordingly or dispose of it properly.

4.8.4. General Labeling Requirements

- Labeling in Canada will comply with WHMIS 2015 (Exhibit 8.2)
- Labels must be legible and accessible to all employees:
  - Locate labels prominently on the container so that the label can be read when the container is in its usual upright position for use.
  - If labels on containers are exposed to the weather, the label information must be clear and conspicuous at all times. The label must be of a material that cannot be defaced or obliterated by rain, snow, or other adverse elements of the weather.
  - For non-English speaking employees, information must be presented in an indigenous language.
- Containers of mixed products are labeled with the chemical name listed on the SDS for each toxic or hazardous substance in the mixture. It is recommended that containers of mixtures also be labeled with the common name of the mixture.
- Rather than labeling individual workplace containers or vessels, label information such as signs, placards, process sheets, batch tickets, operating procedures, or other such written materials may be displayed in the work area. Each alternative method must identify the container or containers to which it applies, identify the hazardous substance(s) in the container, and show appropriate hazard warnings. These written materials must be readily accessible to employees in the work area during each shift.
- Pipelines containing hazardous substances are not considered containers and need not be labeled. However, AHAs will address how employees working on unlabeled pipelines are protected from chemical hazards.

4.8.5. Primary Container Labeling Requirements

- Labels on primary containers must include the following information:
  - Product identifier or chemical name of the product;
  - Signal word;

- Hazard statement(s;
- Precautionary statements(s); and,
- Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party.

4.8.6. Secondary Container Labeling Requirements

- A secondary label is not required on a container that an employee fills and immediately uses if the container remains under his/her direct control until it is empty.
- Labels on secondary containers that *do not meet the exclusion above* must meet section 4.8.5.
- If a hazardous product that an employer receives in a container from a supplier is transferred to another container, the other container shall have a workplace label.

4.8.7. Hazard Communication Pictograms and Hazards

Health Hazard  • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	**Flame**  • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	**Exclamation Mark**  • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  • Gases Under Pressure	**Corrosion**  • Skin Corrosion/Burns • Eye Damage • Corrosive to Metals	**Exploding Bomb**  • Explosives • Self-Reactives • Organic Peroxides
Flame Over Circle  • Oxidizers	**Environment** **(Non-Mandatory)** 	**Skull and Crossbones**  • Acute Toxicity (fatal or toxic)

	• Aquatic Toxicity	

4.9. Training

4.9.1. Parsons notifies its employees of the hazards of chemicals to be used on the worksite. Subcontractors must train their own employees.

4.9.2. Employees shall be provided with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area. This training can be organized and presented to groups or on a work area by work area basis, depending on the operation.

4.9.3. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and safety data sheets.

4.9.4. In accordance with Parsons ESHARP Guidebook, Volumes 1 & 2, the Project SH&E Representative discusses the hazard communication plan during the initial orientation of occasional and business visitors, as well as contractors, who are subject to exposure to hazardous substances.

4.9.5. Before employees perform non-routine or special tasks that may expose them to hazardous chemicals, they are trained on the hazards associated with those chemicals. Specific training for hazards associated with chemicals contained in unlabeled pipes in the employees' immediate work area is provided to affected employees. Supervisors are responsible for identifying training needs during risk mitigation planning (2 week look-ahead) in accordance with the ESHARP Guidebook.

4.9.6. Employees are advised of their rights to chemical hazard information and to specific training with respect to hazardous substances in the workplace. At a minimum, the information and training includes the following topics:

- Details of the Hazard Communication Plan or WHMIS 2015 (Exhibit 8.2).
- Whom to contact for questions regarding chemicals.
- How to obtain a copy of an SDS.
- How to read SDSs, labels, and NFPA hazard classifications (Exhibit 8.5).
- Details on specific chemicals present at the workplace.
  - Identity and location of hazardous substances in the workplace.
  - Physical and health hazards of hazardous substances and potential exposure routes.
  - Methods and observations available for detecting the presence or release of a hazardous chemical in the workplace. Methods can include monitoring conducted by a designated employee. Observations may include the appearance of or the detection of odors of substances.
  - Symptoms of overexposure.
  - Procedures to follow if employees are overexposed to hazardous chemicals.
  - How to handle substances safely.
  - Steps employees must take to protect themselves from hazards, including control procedures, work practices, and PPE.

- Steps the employer has taken to reduce or prevent exposure to hazardous chemicals.
- Emergency response procedures.

4.9.7. The records custodian maintains a record of all training or instruction given to employees, using an acceptable training form. Each employee must sign the Employee Acknowledgment Form (Exhibit 8.6). This form is also maintained as a record of training.

5. Definitions

Term	Definition
Activity Hazard Analysis (AHA)	A procedure, described in Parsons' ESHARP Guidebook, used to identify the hazards or potential hazards associated with each step of a job or work plan to uncover hazards and then eliminate, control, or remove them before the work is started.
Carcinogen	A chemical known or believed to cause cancer in humans.
CAS Number	The identification number assigned by the Chemical Abstracts Service (CAS) to specific chemical substances.
CFR	Code of Federal Regulations
Chemical Name	The scientific designation of a substance in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry or the system developed by the CAS.
Common Name	Any designation or identification, such as code name, code number, trade name, or brand name, used to identify a substance other than by its chemical name.
Consumer Products	Products that can be purchased in a store and are generally intended to be used in the home. They often include cleaning products, adhesives, or lubricants. These products are labelled according to other legislation.
Corporate Safety	Corporate Safety Includes, but is not limited to, Senior Vice President – Safety, Health, Environment and Sustainability; Vice President – Safety, Health, and Environment; SH&E Director
Expose or Exposure	In the course of employment, an employee is subject to a hazardous chemical through any route of entry, including inhalation, ingestion, skin contact, or absorption, and includes potential, possible, or accidental exposure.
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
Hazard Statements	Standard phrases assigned to a hazard class and category that describe the nature of the hazard.
Hazardous Substance	Any element, chemical, compound or mixture of elements or compounds that is a physical hazard or health hazard, excluding those exempted by other regulations.
Hazardous Materials Identification System (HMIS)	Hazard labeling system developed by the National Paint and Coatings Association (NPCA) to help employers comply with the OSHA Hazard Communication standard.
Label	Any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

Term	Definition
Mixture	Mixtures or solutions composed of two or more substances in which they do not react. Alloys, a metallic material, homogeneous on a macroscopic scale, are considered to be mixtures for the purpose of classification under the GHS.
Safety Data Sheet (SDS)	The written document that sets forth the specific information about a toxic or hazardous substance.
Signal Word	A word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. The signal words used in this procedure are "danger" and "warning." "Danger" is used for the more severe hazards, while "warning" is used for the less severe.
Substance	Chemical elements and their compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the product and any impurities deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.
WHMIS	Workplace Hazardous Materials Information System - a worker education and training program required by all Canadian jurisdictions for hazardous products workers work with, or for products that workers may be exposed to at work.

6. Responsibilities

6.1. **Corporate Safety:** Responsible for developing and maintaining this procedure and conducting periodic reviews and updates to ensure alignment and integration with related or referenced policies and procedure; Coordinating reviews by individuals and organizations responsible for and supported by implementation, including resolution of comments received; Develops training materials, forms, and templates necessary to implement the procedure; and providing safety subject matter expertise and guidance to help ensure the success of this procedure.

6.2. **Project Manager (PM):** Ultimately responsible for delivering the project and assigning roles and responsibilities to discipline managers and the Project Management Team; Responsible for reviewing, approving, implementing, and enforcing project Hazard Communication Plan; Designate personnel to conduct project hazard communication plan activities.

6.3. **Project Safety Health and Environmental Representative:** Responsible for developing, monitoring and assisting in the implementation of this procedure and the project hazard communication plan on the jobsite; Conducting orientations, including details of the project hazard communication plan, for subcontractors and new employees; Determining training needs and coordinating training for affected employees; Providing the regulatory expertise to ensure that activities are conducted in compliance with the applicable codes, standards, and regulations; and ensuring that AHAs are performed; Identify and address chemical safety issues during site inspections and AHAs; Assist and oversee the designated personnel in conducting a hazardous substance inventory, maintaining SDSs, and labeling; Review, approve, or designate the need for further assessment of SDS for hazardous chemicals; Exchange hazard communication documentation with subcontractors; Coordinate hazard communication training; Reviews client/subcontractor hazard communication program and provides comments.

6.4. **Superintendent:** Responsible for facilitating compliance with and enforcement of this procedure and the hazard communication plan; Review subcontractor hazard communication program with subcontractor.

6.5. **Foreman/Supervisor:** Responsible for supervising work and enforcing this procedure; and conducting daily safety huddles emphasizing hazard communication; Facilitate hazardous substance inventory; Submit SDS copies of new products; Schedule non-routine tasks.

6.6. **Employees:** Responsible for complying with the requirements of this procedure; Safely handle hazardous chemicals as instructed on AHA, container label, in SDS, and in training; Ask questions regarding the hazards of chemical products if the hazard, procedure, or work instruction is unclear..

6.7. **Subcontractors:** Responsible for complying with all Parsons' requirements; Develop, implement, and submit subcontractor hazard communication program; Maintain labels and submit copies of SDSs for all hazardous substances brought on site; Training their own employees in applicable Parsons' procedures.

6.8. **Records Custodian:** Responsible for documenting employee training and serving as records custodian, maintaining and archiving related documentation.

6.9. **Designated Person(s):** Responsible for conducting hazardous substance inventory; Compile and update SDS; Maintain labeling.

7. Exceptions

7.1. The PM may request or require a more stringent process if required by the contract or is beneficial to the project.

8. Exhibits

8.1. WHMIS 2015

8.2. Hazardous Substance Inventory Sheet

8.3. Employee SDS Request Form

8.4. NFPA Hazard Classifications

9. Revision History

Revision	Changes	Approver	Approval Date
2	Revised approver from Barber to Barker; Changed PSHEM to Project SH&E Representative; Removed BU Safety Director from Roles; Added COR Safety definition; Removed Exhibits 8.1 Sample Project Hazard Communication Plan; 8.4 Manufacturer's SDS Request Letter; 8.7 Employee Acknowledgement Form	Barker, John	7/31/2019
1	Updates – WHMIS 2015	Beck, Gregory	11/08/2018
0	Original Issue	Barber, Brad	4/10/2014

Exhibit 8.1: Workplace Hazardous Materials Information System (WHMIS 2015)

The most current version of this form is available for download and use on the Parsons Canada SH&E Home site [PWeb > Business Groups > Operations-Safety > Canada SH&E Home > Training > Workplace Hazardous Materials Information System (WHMIS)].

Exhibit 8.2 Hazardous Substance Inventory Sheet

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

PARSONS

Hazardous Substance Inventory Sheet

Department:	Supervisor:	Date:
Product Name:		
Chemical(s) as Listed on Label		
Product ID or Stock No.		
Location (pipe shop, etc.)		
Manufacturer's Name:	Telephone:	
Manufacturer's Address:		
Distributor's Name(If on container):	Telephone:	
Distributor's Address:		
Container Size:	Container Count:	
Estimated Quantity:		
Does product have a warning or caution label (e.g., flammable, combustible, toxic)?	Yes ☐	No ☐
Indicate product type:		
Product used for:		
Trades involved in use are:		
Do you have a recent (within 3 years) safety data sheet (SDS) on file for this project? If yes, attach copy to this form.	Yes ☐	No ☐

A hazardous chemical is any chemical that carries a manufacturer's warning on the container label, such as "Warning: this Product is Hazardous to your Health," or a chemical listed as hazardous on the product's SDS. When determining whether a chemical is hazardous, refer to the Hazard Communication Procedure for definition of chemicals classified as hazardous.

A nonhazardous chemical is one that either has no warning language on the label or one that does not meet the criteria for a hazardous chemical. **If the manufacturer does not provide a warning label on the container or an SDS for the product, the employer can treat it as a nonhazardous chemical.**

Consumer Product: A chemical defined as a consumer product and regulated under provisions of the Consumer Product Safety Commission is not included in coverage of hazardous chemicals. If you purchase a product, kept it in the same packaging, and use that product for its intended use in accordance with consumer warning labels, the product is a consumer product and thus exempt. However, if you use any consumer product in a manner it was not designed for or in circumstances that a consumer would not be exposed to (e.g., confined-space use), the chemical should be treated as hazardous.

8.3: Employee SDS Request Form

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

PARSONS

Employee SDS Request Letter

This form is provided to assist employees in requesting Safety Data Sheets (SDSs) concerning the safety and health hazards of toxic substances found in the workplace.

1. Project:____________________
2. Name:____________________
3. Job Title/Craft:____________________
4. Supervisor:____________________
5. Specific Work Location:____________________
6. Phone Number:____________________

Describe briefly the toxic substances you are exposed to:

1. Trade Name:____________________
2. Chemical Name or Ingredients (if known):____________________
3. Manufacturer (name and address, if known):____________________

   ____
4. Does substance have a label? ☐ Yes ☐ No

   If yes, attach a label or a copy of information on label.
5. Physical form of substance: ☐ Gas ☐ Liquid ☐ Solid ☐ Dust ☐ Other
6. Any other information that identifies the substance (the circumstances of exposure, other characteristics of the substance, etc.):____________________

   ____

   ____

If you have specific questions, write them below: ____________________

____

____

____

Submitted by (Signature)Received by (Signature)

____

DateDate/Time

____

Issued by (Signature)

____

Date

8.4: Hazard Classifications (NFPA vs. HazCom2012)

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

PARSONS

Hazard Classifications

Hazard Classifications - Comparison of NFPA 704 and HazCom 2012 Labels

	NFPA 704	HazCom 2012
Purpose	Provides basic information for emergency personnel responding to a fire or spill and those planning for emergency response.	Informs workers about the hazards of chemicals in workplace under normal conditions of use and foreseeable emergencies.
Number System: NFPA Rating and OSHA's Classification System	0-4 0-least hazardous 4-most hazardous	1-4 1-most severe hazard 4-least severe hazard • The Hazard category numbers are NOT required to be on labels but are required on SDSs in Section 2. • Numbers are used to CLASSIFY hazards to determine what label information is required.
Information Provided on Label	• Health-Blue • Flammability-Red • Instability-Yellow • Special Hazards*-White * OX Oxidizers W Water Reactives SA Simple Asphyxiants	• Product Identifier • Signal Word • Hazard Statement(s) • Pictogram(s) • Precautionary statement(s); and • Name address and phone number of responsible party.
Health Hazards on Label	Acute (short term) health hazards ONLY. Acute hazards are more typical for emergency response applications. Chronic health effects are not covered by NFPA 704.	Acute (short term) and chronic (long term) health hazards. Both acute and chronic health effects are relevant for employees working with chemicals day after day. Health hazards include acute hazards such as eye irritants, simple asphyxiants and skin corrosives as well as chronic hazards such as carcinogens.
Flammability/ Physical Hazards on Label	NFPA divides flammability and instability hazards into two separate numbers on the label. Flammability in red section Instability in yellow section	A broad range of physical hazard classes are listed on the label including explosives, flammables, oxidizers, reactives, pyrophorics,combustible dusts and corrosives.
Where to get information to place on label	Rating system found in NFPA Fire Protection Guide to Hazardous Materials **OR** NFPA 704 Standard System for Identification of the Hazards of Materials for Emergency Response 2012 Edition. Tables 5.2, 6.2, 7.2 and Chapter 8 of NFPA 704	OSHA Hazard Communication Standard 29 CFR 1910.1200 (2012). 1) Classify using Appendix A (Health Hazards) and Appendix B (Physical Hazards) 2) Label using Appendix C
Other	The hazard category numbers found in section 2 of the HC2012 compliant SDSs are NOT to be used to fill in the NFPA 704 diamond.	Supplemental information may also appear on the label such as any hazards not otherwise classified, and directions for use.

1. Purpose

This procedure describes the process, tools, roles, and responsibilities for the selection and use of personal protective equipment (PPE) including eye, face, head, arm, hand, body, and foot protection.

2. Scope

2.1. This procedure applies to Parsons Corporation and all Parsons' businesses and subsidiaries worldwide, including joint ventures and similar partnerships managed by Parsons.

2.2. This procedure applies to all Parsons personnel and subcontractors working on Parsons projects at any location worldwide, regardless of country of operation and/or Business Unit (BU).

3. References

3.1. 29 CFR 1910, Subparts H and I

3.2. 29 CFR 1926, Subpart E

3.3. 29 CFR 1926.28

3.4. ANSI/ISEA Z87.1-2015 Standard

3.5. ANSI/ISEA Z89.1-2014

3.6. ANSI Z49.1:2012

3.7. ASTM F2413-18, Protective (Safety) Toe Cap Footwear

3.8. AWS F2.2-89, Lens Shade Selector

3.9. CSA Standard - Z94.1-05 (Industrial Protective Headwear), Z94.3-07 (Eye and Face Protectors), Z195-14 (Protective Footwear)

3.10. OSHA Publication 3151-12R, 2004, Personal Protective Equipment

3.11. Parsons ESHARP Guidebook - Volume I (Project)

4. Procedure

4.1. **Site Specific PPE Plan**

4.1.1. The PSHEM (Project Safety, Health, and Environmental Manager) leads the development of, and assists the Project Manager (PM) in implementing, a site-specific Personal Protective Equipment (PPE) plan. The PPE plan is included in the Project Safety, Health, and Environmental Plan (PSHEP) in accordance with Parsons' ESHARP Guidebook – Volume 1. The PSHEM may refer to the Sample PPE Plan (Exhibit 8.1), which includes the PPE plan requirements described in the following subsections.

4.2. **General Requirements**

4.2.1. PPE should not be used as a substitute for engineering, work practice, or administrative controls. PPE should be used in conjunction with these controls to provide for employee safety and health in the workplace. PPE is provided for use and shall be maintained in a sanitary and reliable condition. The basic element of any management program for PPE should be an in-depth evaluation of the equipment needed to protect against the hazards encountered. The evaluation is required by reasons of hazards of processes or environment to protect body parts from inhalation, absorption or physical contact. It should also be used to set a standard operating procedure (SOP) for training personnel on the limitations, proper use, and maintenance of the PPE.

4.2.2. The use of employee-owned equipment is not permitted as a general rule. If the use of employee-owned equipment is permitted with the approval of the Safety, Health, and Environmental (SH&E) Department, Parsons shall be responsible for assuring its adequacy, maintenance, and sanitation.

4.2.3. As a minimum, the following PPE is required on all Parsons project sites:

- ANSI/CSA-approved safety glasses with side shields
- ANSI/CSA-approved hard hat
- ASTM/CSA-approved footwear
- ANSI/CSA Z96 high visibility safety vest

Exceptions to the minimum PPE for project sites must be approved by the BU SH&E Director

4.2.4. Defective PPE or PPE that is in disrepair must be discarded or removed from service until repaired.

4.2.5. PPE should only be used as a control if hazards cannot be eliminated or controlled through engineering or administrative controls.

4.3. **Hazard Assessment**

4.3.1. The workplace is assessed to determine if hazards are present, or are likely to be present, which necessitate the use of PPE. If such hazards are present, or likely to be present:

- Select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;
- Communicate selection decisions to each affected employee; and
- Select PPE that properly fits each affected employee.

The hazard assessment shall be certified by the person who completed the hazards assessment and the date the assessment was completed.

4.3.2. Activity Hazard Analyses (AHAs) identify the tasks for which PPE beyond the minimum required is necessary. If the AHA indicates that additional PPE is necessary, the PSHEM selects the specific PPE. AHAs are conducted and/or updated for PPE under the following circumstances:

- When a job changes
- When new equipment or process is introduced
- When an accident has occurred
- When a supervisor or employee requests it

4.4. **PPE Selection**

4.4.1. The PSHEM selects the appropriate PPE based on a hazard assessment of the workplace to identify and control physical and health hazards, Safety Data Sheet (SDS) review (if applicable) and any regulatory requirements. ANSI/CSA Standards and OSHA Publication 3151-12R, 2004 should be used as a guide for selecting PPE. The superintendent and project manager assist in determining the appropriate PPE and ensure that it is provided to the employees.

4.4.2. The PSHEM should be aware of the types of PPE available and the levels of protection offered. Selection tools for determining appropriate PPE for the task include:

- Eye and Face Protection Selection Guide Standard (Exhibit 8.2)
- Head Protection Selection Guide Standard (Exhibit 8.3)
- Foot Protection Selection Guide Standard (Exhibit 8.4)
- Protective Clothing Selection Guide Standard (Exhibit 8.5)
- Hand Protection Selection Guide Standard (Exhibit 8.7)
- Filter Lenses for Welding Selection Guide Standard (Exhibit 8.8)
- Laser Safety Lenses Selection Guide Standard (Exhibit 8.9)
- Drowning Protection Guide Standard (Exhibit 8.10)
- OSHA website: Personal Protective Equipment Overview
- Review of applicable SDS
- Consultation with sales representative, manufacturer, or Corporate Safety

4.4.3. The selection of appropriate protection is based on an evaluation of the performance characteristics of the PPE relative to the task(s) to be performed, conditions present, duration of use, and hazards identified in the AHA.

- Selected PPE must be fitted to each affected employee. Fitting includes the proper donning, doffing, cleaning, maintenance and storage procedures.
- PPE should not interfere with the employee's work or create additional hazards (e.g., fogged lenses, trip hazard, loose materials).
- All PPE must be of safe design and construction for the work to be performed.
- Where feasible, PPE should provide a level of protection greater than the minimum required to protect employees from hazards.
- If several different types of PPE are worn together, they must be compatible.
- Consider the fit and comfort of PPE when selecting appropriate items to encourage employee use of PPE. Multiple styles and sizes of PPE are available to accommodate employees. Select size-adjustable PPE (e.g., hard hats, lanyards) when available.
- Consider the chemical resistance properties of the PPE material based on a review of the SDS.

4.5. **PPE Provisions**

4.5.1. Parsons provides PPE to employees at no cost, if the PPE is required by the AHA or is of the type that would not reasonably or normally be worn away from the workplace (e.g., single-use or disposable PPE). Except for required specialized safety boots, the employee must provide his own work boots.

4.5.2. Subcontractors must provide their own PPE.

4.5.3. PPE being purchased will meet ANSI/CSA standards and comply with regulatory requirements or legislation.

4.6. **PPE Use/Maintenance/Inspection**

4.6.1. PPE for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, must be provided, used, and maintained in a sanitary and reliable condition.

4.6.2. PPE must be inspected before and after use for signs of fatigue, failure or defects. An inspection schedule shall be in place that meets or exceeds manufacturer's or legislated requirements. Inspections of specialized PPE will be documented in IndustrySafe (Audits, Inspections, and Meetings > PPE Inspection Checklist).

4.7. **Training**

4.7.1. Parsons trains each employee who must use PPE as required by this procedure. Subcontractors must train their own employees.

4.7.2. Employees are trained on the selection, fitting, care and use of all PPE and specialized PPE. Training includes when to wear PPE, what PPE should be worn, how to put on and take off and adjust PPE, limitations of the PPE and its use, care, maintenance and storage. Each affected employee must demonstrate an understanding of training received and the ability to use PPE properly. When there is a reason to believe that any employee who has been trained does not have the required understanding and skill or there are changes in the workplace, the employee must be retrained.

4.7.3. The PSHEM arranges employee training at the time of initial assignment. Supervisors are responsible for identifying additional employee training needs during risk mitigation planning (two-week look ahead). Training can be organized and presented to groups or on a work area by work area basis, depending on the operation.

4.7.4. PPE training shall be documented. The certification shall include the employee name, the dates of training, and the training content.

4.8. **Documentation**

4.8.1. The records custodian documents all instruction and training. The PSHEM maintains project training records at the site for the duration of the project and archives them at project close.

5. Definitions

Term	Definition
Activity Hazards Analysis (AHA)	A procedure, described in Parsons ESHARP Guidebook, used to identify the hazards or potential hazards associated with each step of a particular job or work plan in order to uncover hazards and then eliminate, control, or remove them before the work is started.
ANSI/ISEA	American National Standards Institute/International Safety Equipment Association
AWS	American Welding Society
CFR	Code of Federal Regulations

Term	Definition
Corporate Safety	Includes, but is not limited to, Senior Vice President – Safety, Health, Environment & Sustainability; Vice President – Safety, Health and Environment (SH&E); and SH&E Director.
CSA	Formerly the Canadian Standards Association
OSHA	Occupational Safety and Health Administration
Specialized PPE	Includes, but is not limited to, equipment related to hearing protection, fall protection, respiratory protection (half facepiece, full facepiece, powered air purifying respirator (PAPR), self-contained breathing apparatus (SCBA), supplied airline respirator) and body protection against hazardous substances (Level A, B, C, and D).

6. Responsibilities

6.1. **Corporate Safety:** Responsible for developing and maintaining this procedure and conducting periodic reviews and updates to ensure alignment and integration with related or referenced policies and procedure; coordinating reviews by individuals and organizations responsible for and supported by implementation, including resolution of comments received; develops training materials, forms, and templates necessary to implement the procedure; and providing safety subject matter expertise and guidance to help ensure the success of this procedure and auditing its effectiveness.

6.2. **Project Manager (PM):** Ultimately responsible for delivering the project and assigning roles and responsibilities to discipline managers and the Project Management Team. Ensures employees use PPE identified for their protection on the job.

6.3. **Superintendent:** Responsible for facilitating compliance with and enforcement of this procedure; provides secure storage facilities and personnel to maintain PPE accordingly.

6.4. **Project Safety Health and Environmental Manager (PSHEM):** Responsible for developing, monitoring and assisting in the implementation of this procedure on the jobsite; determining provisions for cleaning and storing PPE throughout the project; conducting orientations for subcontractors and new employees; determining training needs and coordinating training for affected employees; providing the regulatory expertise to ensure that activities are conducted in compliance with the applicable codes, standards, and regulations; ensuring that AHAs are performed; conduct inspections to monitor compliance with PPE plan; enforce proper employee use of PPE; and monitor effectiveness of selected PPE.

6.5. **Foreman/Supervisor:** Responsible for supervising work and enforcing this procedure; conducting daily safety huddles emphasizing safety; PPE cleaning and maintenance system; issue the appropriate PPE to employees before the start of work and enforce proper usage of PPE.

6.6. **Employees:** Responsible for complying with the requirements of this procedure. Inspect PPE before and after each use for defects.

6.7. **Subcontractors:** Responsible for complying with all Parsons' requirements and procedures; and training their own employees.

6.8. **Records Custodian:** Responsible for documenting employee training and serving as records custodian, maintaining and archiving related documentation.

7. Exceptions

7.1. The PM may request or require a more stringent process if required by the contract or is beneficial to the project.

8. Exhibits

8.1. Sample PPE Plan

8.2. Eye and Face Protection Selection Guide

8.3. Head Protection Selection Guide

8.4. Foot Protection Selection Guide

8.5. Protective Clothing Selection Guide

8.6. Safety Glasses & Work Boots Request Form

8.7. Hand Protection Selection Guide

8.8. Filter Lenses for Welding Selection Guide

8.9. Laser Safety Lenses Selection Guide

8.10. Drowning Protection Guide

9. Revision History

Revision	Changes	Approver	Approval Date
3	Add Definitions for Corporate Safety and Specialized PPE. Add 4.5.3 and 4.6.2. Modify 4.4.1, 4.4.2, 4.4.3 and 4.7.2.	Beck, Gregory	6/20/2019
2	Revisions and additions	Beck, Gregory	11/07/2018
1	Updates	Barber, Brad	06/03/2016
0	Original Issue	Barber, Brad	05/11/2016

Exhibit 8.1: Sample PPE Plan

The most current version of this form is available for download and use on the Parsons Corporate Policy Center.

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Sample Project Personal Protective Equipment (PPE) Plan Instructions

The following sample program is to be used by the Project Safety, Health, and Environmental Manager (PSHEM) as a format to develop, establish, and implement site-specific PPE requirements and rules. This sample plan may be copied, expanded, and modified to meet specific workplace requirements/conditions. The program must be in accordance with all state and local regulations and the requirements in the Personal Protective Equipment Procedure. Highlighted areas in text are to be amended or added, as necessary, for the particular PPE plan.

Sample PPE Plan

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Project Name: ______________________________

Project Location: ______________________________

Project Start Date: ______________________________

Introduction

The purpose of the Personal Protective Equipment Plan (PPE Plan) is to protect the employees at (Name of your project) from exposure to workplace hazards and the risk of injury through the use of PPE.

PPE cannot be used as a substitute for engineering, work practice, and/or administrative controls; it is used in conjunction with these controls to ensure employee safety and health in all Parsons' operations. PPE does not eliminate a hazard; if PPE fails, exposure may occur.

Parsons provides PPE when it is determined that its use is required to ensure the safety and health of our employees and that such use will lessen the likelihood of occupational injury and/or illness. PPE is not used for any purpose other than employee protection.

This section addresses general PPE requirements, including eye and face, head, foot and leg, hand and arm, body protection, and protection from drowning. Separate programs exist for respiratory, fall, and hearing protection.

The (Name of your project) PPE Plan includes:

- Required PPE
- Activity Hazard Analyses (AHAs)
- PPE selection
- Use and maintenance of PPE

Sample PPE Plan
Page 3 of 6

Required PPE

PPE cannot be used as a substitute for engineering, work practice, and/or administrative controls. PPE is used with these controls to ensure employee safety and health among all Parsons' operations. PPE does not eliminate the hazard; if PPE fails, exposure will occur.

The following minimum PPE is required for all persons on this project site:

1. ANSI-approved safety glasses with side shields
2. ANSI-approved hard hats (company logo recommended)
3. All-leather, above-the-ankle, lace-up work boots
4. High-visibility vest (company logo recommended)

Employees are required to wear the following PPE for the following jobs on this project. AHAs for each job are available from the Project Safety, Health, and Environmental Manager (PSHEM).

PPE	Job (AHA No.)
Eye/Face Protection	
Goggles	
Welding Shields	
Laser Safety Goggles	
Face Shields	
Other (specify)	
Head Protection	
Class C (Conductive) Hard Hat	
Class G (General) Hard Hat	
Class E (Electrical) Hard Hat	
Other (specify)	
Foot/Leg Protection	
Leggings	
Metatarsal guards	
Toe guards (steel toe boots)	
Safety shoes (specify type[s])	
Other (specify)	

Sample PPE Plan
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PPE	Job (AHA No.)
Hand/Arm Protection	
Leather gloves	
Canvas gloves	
Metal-mesh gloves (specify metal)	
Fabric gloves	
Coated-fabric gloves (specify coating)	
Butyl rubber gloves	
Latex (natural) rubber gloves	
Neoprene gloves	
Nitrile gloves	
Other (specify)	
Body Protection	
"Paper" disposable suits (Tyvek)	
Cotton suits	
Duck suits	
Leather suits	
Chemical protective (specify material)	
Other (specify)	
Drowning Protection	
Personal flotation device (PFD)	

Activity Hazard Analyses (AHAs)

AHAs identify tasks for which PPE beyond the minimum required is necessary. The PSHEM ensures that each new task the workplace is assessed to determine if hazards are present or likely to be present. Analyses are conducted in accordance with the Parsons ESHARP Manual.

AHAs are conducted and/or updated for PPE when the following conditions arise:

- A job changes
- New equipment or process is introduced
- An accident has occurred
- A supervisor or employee requests an AHA

Sample PPE Plan

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PPE is used as a control only if hazards cannot be eliminated or controlled through engineering or administrative controls.

Contact (the PSHEM) for a copy of a specific AHA.

PPE Selection

The PSHEM selects the appropriate PPE for each potential hazard presented in the AHAs. The superintendent and project manager assist in determining the appropriate PPE.

Appropriate protection is selected based on an evaluation of the performance characteristics of the PPE relative to the task(s) to be performed, conditions present, duration of use and hazards and potential hazards identified.

- PPE must not interfere with work or create additional hazards (e.g., fogged lenses, trip hazard, loose materials).
- All PPE must be of safe design and construction for the work to be performed.
- Where feasible, PPE provides a level of protection greater than the minimum required to protect employees from hazards.
- If several different types of PPE are worn together, they must be compatible.
- Consider the fit and comfort of PPE when selecting appropriate items to encourage employee use of PPE. Multiple styles and sizes of PPE are available to accommodate employees. Select size-adjustable PPE when available (e.g., hard hats, lanyards).
- Consider the chemical resistance properties of the PPE material.

Use and Maintenance of PPE

Parsons provides PPE at no cost to employees if the PPE is required by the AHA or is of a type that would not reasonably or normally be worn away from the workplace, (e.g., single use or disposable PPE).

- The (foreman or supervisor) provides appropriate PPE to employees before the start of work.
- When employees provide their own PPE, Parsons is responsible for ensuring its adequacy, including determining that it is maintained in clean and reliable condition. The foreman/supervisor reviews any employee-owned PPE at the start of work.

The PSHEM determines provisions for cleaning and storing PPE throughout the project. The superintendent provides secure storage facilities and personnel to maintain PPE accordingly. All PPE must be used and maintained in a clean and reliable condition as described below:

- Keep face and eye protection clean and in good condition. Cleaning is particularly important for eye and face protection: dirty or fogged lenses could impair vision.
- Disinfect goggles, gloves, respirators, and other protectors that have been previously used before they are issued to another employee.
- If contaminated PPE cannot be decontaminated, dispose of it in a manner that protects employees from exposure to hazards.
- If employees provide their own PPE, the foreman/supervisor must ensure that it is maintained in a clean and reliable condition.

Sample PPE Plan
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The project manager must ensure that employees use PPE identified for their protection on the job:

- Before and after each use, employees must inspect PPE for defects and to ensure that defective PPE is not used.
- Defective and damaged PPE cannot be used.

[Attach a copy of the manufacturers cleaning and care instructions for all PPE provided to your employees.]

Storage provisions: [*indicate storage location(s) or if employee is responsible for PPE*]
Cleaning provisions: [*indicate who/how/when PPE will be cleaned*]
Inspection Provisions: [*indicate who/when/what for PPE will be inspected*]

Exhibit 8.2: Eye and Face Protection Selection Chart

The most current version of this Standard is available for download and use on the Parsons Corporate Policy Center.

All Parsons and contractor employees assigned to field projects or who perform field-related work activities will be provided with, and required to wear, basic eye protection (safety glasses with side shields) at all times while performing field tasks, and while on any project, except when inside offices, inside enclosed vehicles, and/or when wearing goggles or a full-face respirator.

Eye and face protection equipment must meet the requirements specified in ANSI Z87.1-1968, Practice for Occupational and Educational Eye and Face Protection if manufactured before July 5, 1994, and ANSI Z87.1-1989 for articles manufactured after July 5, 1994.

Employees who wear corrective eyeglasses must be protected by goggles or safety glasses, including prescription safety glasses that include protective lenses, goggles capable of being worn over prescription glasses, goggles with prescription lenses mounted behind the protective lenses.

The following are recommended Eye and Face Protection Equipment:

Source	**Assessment of Hazard**	**Protection**
Impact		
Chipping, grinding machining, masonry work, woodworking, sawing, drilling, chiseling, powered fastening, riveting, and sanding	Flying fragments, objects, large chips, particles, sand, dirt, etc.	Spectacles with side protection, goggles, face shields. For severe exposure, use face-shield.
Chemicals		
Acid and chemicals handling, degreasing plating	Splash	Goggles, eyecup and cover types. For severe exposure, use face shield.
Dust		
Woodworking, buffing, general dusty conditions	Nuisance dust	Goggles, eyecup and cover types.
Light/UV Radiation*		
Welding: Electric arc	Light/UV radiation	Welding helmets or welding shields.
Welding: Gas	Light/UV radiation	Welding goggles or welding face shield.
Cutting, torch brazing, torch soldering	Light/UV radiation	Spectacles or welding face-shield.
Glare	Poor vision	Spectacles with shaded or special-purpose lenses, as suitable.

* Employees must use portable welding shields if they might have eye contact with arc welding.

Exhibit 8.3: Head Protection Selection Guide

The most current version of this Standard is available for download and use on the Parsons Corporate Policy Center.

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All Parsons and contractor employees assigned to field projects or who perform field-related work activities are provided with, and are required to wear, Class B head protection at all times while performing field tasks. The need for additional PPE is addressed through AHAs. All personnel must wear appropriate hard hats at all times while on any project, except when inside offices or inside enclosed vehicles (e.g., cars and trucks).

Hard hats must comply with ANSI Z89.1-1997.

Hard hats may not be altered from manufacturer's original design. Drilling holes or cutting the shell of the hat is forbidden. Painted hard hats are not allowed and alterations to the hat or suspension system are not permitted.

Hard hats must be replaced every three years, when impacted by a falling object, and when otherwise required by the manufacturer. Hard hats damaged in any way must be replaced.

All components, shells, suspensions, headbands, sweatbands, and any accessories should be visually inspected daily for signs of dents, cracks, penetration, or other damage that might reduce the degree of safety originally provided.

Hard hats are grouped into three classes (C, G, and E) and two types (1 and 2) according to how they meet various criteria for protection from impact, penetration, electrical conductivity, flammability and other safety hazards:

Hard Hat Classes and Types	Safety Description
Class C	Hard hats protect the head from the force of impact of falling objects.
Class G	Hard hats protect the head from the force of impact of falling objects and from electrical shock during contact with exposed low-voltage conductors.
Class E	Hard hats protect the head from the force of impact of falling objects and from electrical shock during contact with exposed high-voltage conductors.
Type 1	Hard hats protect the head from the force of impact resulting from a blow only to the top of the head.
Type 2	Hard hats protect the head from the force of lateral impact resulting from a blow which may be received off-center, from the side, or to the top of the head.

In radiation areas, the use of hard hats must be sufficient to adequately protect personnel. A limited number of hard hats are kept in a radiation work area for general use.

Supplementary hard hat equipment includes winter liners, sweat bands, chinstraps, and cloth caps.

When using a face shield, welding hood, or sandblasting hood, use the type that combines with a hard hat.

Protect hair against being caught in moving machinery, subjected to sparks, or snagged on objects. Protect long hair by compacting it into the hard hat shell or by use of a hair net or ties so that it is not loose.

If worn correctly, the hard hat protects in the following ways:

- The hard hat shell is the basic impact protection against falling and flying objects and bumping into objects.
- The curved shell allows an object to ricochet or slide off, reducing the force of impact.
- The space maintained between the shell and the head (minimum of 1¼ inches) above the suspension, minimizes the shock, and prevents the shell from striking the head solidly upon impact.

Head Protection Selection Guide

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- The space between the suspension and the shell (sufficient for ventilation) on the side of the hat softens the effect of lateral blows.
- The peak and brim protect the face and the outwardly curved bottom edge affords protection to the ears and the nape of the neck.

Exhibit 8.4: Foot Protection Selection Guide

The most current version of this Standard is available for download and use on the Parsons Corporate Policy Center.

Foot Protection

At a minimum, all Parsons and contractor employees assigned to field projects or who perform field-related work activities must wear sturdy leather work boots at all times while:

- Performing field tasks.
- In areas where there is a danger of foot injuries from falling or rolling objects.
- Where there is a danger of objects piercing the sole.
- When working with chemicals.
- When working on or near electrical hazards.

Appropriate footwear must be worn at all times by all personnel while on any project, except when inside offices and inside enclosed vehicles (e.g., cars and trucks). Safety boots are strongly recommended. The need for more stringent footwear and/or additional PPE is addressed through AHAs.

Protective footwear must comply with ANSI Z41-1999. Footwear in need of repair is prohibited. Rips in material, broken heels, split seems, and holes in the footwear are examples of a need to replace. Sneakers, canvas shoes, sandals, tennis shoes, loafers, walking shoes, athletic or other soft leather-type shoes are not acceptable footwear for field activities.

Foot Protection Selection Guidelines

- Protective footwear with impact protection is required for carrying or handling heavy materials and for activities where objects might fall onto the feet, e.g., metatarsal safety boots.
- Protective footwear with compression protection is required for work activities involving anything that could potentially roll over an employee's feet e.g., metatarsal safety boots.
- Protective footwear with puncture protection is required where sharp objects could be stepped on by employees causing a foot injury, e.g., sole puncture-resistant safety boots.
- Protective footwear with chemical protection is required for work involving exposure to chemicals, e.g., rubber safety boots.
- Electrical hazard or dielectric footwear is required as a supplementary form of protection when primary forms of electrical protective equipment, such as rubber insulating gloves and blankets, do not provide complete protection for an employee standing on the ground, e.g., conductive, electrical hazard, or static dissipative safety boots.

Exhibit 8.5: Protective Clothing Selection Guide

The most current version of this Standard is available for download and use on the Parsons Corporate Policy Center.

Many hazards can threaten the torso including, but not limited to, the following: heat, splashes from hot metals and liquids; impacts; cuts; acids; and/or radiation. A variety of protective clothing is available including the following: vests, jackets, aprons, coveralls, and full body suits. Protective clothing selection and use must follow protective garment manufacturer's recommendations.

The need for protective clothing is addressed through AHAs. Appropriate gloves are required where employees may be exposed to the following:

- Chemical skin absorption
- Temperature extremes
- Hot splashes from molten metals and other hot liquids
- Potential impacts from tools, machinery, and materials
- Hazardous chemicals
- Cuts
- Radiation

Protective clothing should be specific to the task and may include cotton coveralls, Tyvek coveralls, leather pants, or appropriate chemical protective suits.

Exhibit 8.6: Safety Glasses & Work Boots Request Form

The most current version of this Form is available for download and use on the Parsons Corporate Policy Center.

Prescription Safety Glasses ANSI Z87.1-2003

Parsons will provide employees one pair of prescription high-impact safety glasses once every two (2) years. Safety glasses must meet the following three (3) requirements.

1. Must be ANSI Z87-2 approved frames and temples.
2. Must be ANSI Z87-2 approved lenses.
3. Must have permanent or matching attachable side shields.

To order glasses the employee must provide to the eyewear provider a current prescription (e.g., less than one [1] year old). Cost for additional lens treatments, examples listed below, is paid by the employee or personal insurance to the eyewear provider.

Examples: **Tinting** **Ultra-violet protection** **No-Glare coatings** **Photo-chromatic**

Supervisor initial for authorization	Prescription Type	Covered Cost	Check One
	Single Vision	$100.00	
	Bifocal Vision	$150.00	

Employees purchasing project-required safety equipment must provide adequate receipts and documentation to fulfill Parsons' finance and accounting requirements.

Safety Toe Boot – ASTM F 2413-05

Parsons will provide for employees one pair of safety toe boots at a frequency normally not to exceed once every 2 years. Safety toed boots must meet the following four (4) requirements.

Supervisor initial for authorization	1. Must be all weather use. 2. Must be boot style with over the ankle protection. 3. Must have steel or composite material safety toe. 4. Must meet minimum requirements of ASTM F 2413-05.

Replacement policy for safety toed boots:

- Replacement will be determined on a case by case basis, considering normal wear and tear on shoes.
- More frequent replacement must be approved by responsible Supervisor and Functional Manager or Project Manager.
- Specialized needs (e.g., orthopedic inserts) due to physical conditions shall be met by employee's use of medical insurance coverage

Maximum allowance for safety toed boot is $120.00. Any cost above this allowance is paid by the employee.

Personalized safety glasses and boots are provided to each employee according to need. Each employee must care for and protect these items as with any Company furnished items. Loss and damage beyond normal wear will be handled in accordance with Parsons' requirements.

Employee:

Print Name **Signature** **Date**

Supervisor:

Print Name **Signature** **Date**

Functional Manager:

Print Name **Signature** **Date**

Project Manager:

Print Name **Signature** **Date**

NOTE: Form shall be used for only 1 item (i.e., safety toed boots or prescription safety glasses).

Exhibit 8.7: Hand Protection Selection Guide

The most current version of this Standard is available for download and use on the Parsons Corporate Policy Center.

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Glove Selection

Gloves must be selected that are correct for the particular job. Appropriate gloves are required when employees may be exposed to:

- Cuts
- Abrasions
- Lacerations
- Punctures
- Chemical or thermal burns
- Chemical skin absorption
- Frostbite

All field personnel should use the appropriate gloves when there is a chance their hands could be injured. Consideration must also be given to the proximity of the hand to rotating equipment. Gloves should not be worn when there is a chance that they could become entangled.

No one glove provides protection against all potential hand hazards, and commonly available glove materials provide only limited protection against many chemicals. The need for arm and hand protection is addressed through AHAs.

Glove Type	Situation
Leather or cotton gloves	General purpose gloves used on jobsite.
Leather gloves	Protection from sparks, moderate heat, blows, chips, and rough objects.
Leather gloves and sleeves	Protection when cutting, welding, or grinding.
Chemical protective gloves	When handling hazardous materials, gloves should be composed of the appropriate chemical-resistant materials in accordance with the Chemical Resistance Selection Chart for Protective Gloves.
Metal mesh or Kevlar gloves	When performing work with sheet metal or materials that may have sharp and jagged edges.
Cut resistant gloves (100% Dyneema yarn)*	Handling glassware (i.e. placing caps on VOA glass vials).

*Cut-resistant gloves shall be worn under other gloves

Electrical

Lineman-type gloves must be used in conjunction with work on live electrical sources, and the gloves must be inspected according to OSHA and manufacturer recommendations. Rubber protective equipment for electrical work must conform to the requirements established in ANSI. In all situations, the lock out/tag out procedure must be followed as a precaution against electrocution. Work on energized electrical equipment is done as a last resort only.

- All protective equipment used must be tested before use when working on live electrical sources. Any work performed on live electrical sources must be done in conjunction with OSHA standard 1926.400 and 1910.137.

Hand Protection Selection Guide

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- Glove selection for this hazard should follow manufacturer's specifications for heat resistance based on the extremes of temperatures encountered in the job process.
- You must wear an electrically nonconductive hard hat.

Chemical

- When dealing with chemicals, a Safety Data Sheet (SDS) must be consulted for the chemical in question. The specific type of glove that should be used is described below.
- Consideration should be made to the likelihood of encountering abrasive material in the course of the exposure. Steps must be taken to protect the glove from punctures in these cases.
- Reusable gloves must be either thoroughly cleaned before being stored, or they must be properly disposed of. Contaminated gloves may not be stored with clean materials.
- Single-use gloves must be disposed of immediately upon removal. These gloves may not be reused.

Chemical Resistance Chart

The U.S. Department of Energy rates various gloves as being protective against specific chemicals. The ratings are abbreviated as follows: VG: Very Good; G: Good; F: Fair; P: Poor (not recommended). Chemicals marked with an asterisk (*) are for limited service.

Chemical	Neoprene	Latex/ Rubber	Butyl	Nitrile
Acetaldehyde*	VG	G	VG	G
Acetic acid	VG	VG	VG	VG
Acetone*	G	VG	VG	P
Ammonium hydroxide	VG	VG	VG	VG
Amy acetate*	F	P	F	P
Aniline	G	F	F	P
Benzaldehyde*	F	F	G	G
Benzene*	P	P	P	F
Butyl acetate	G	F	F	P
Butyl alcohol	VG	VG	VG	VG
Carbon disulfide	F	F	F	F
Carbon tetrachloride*	F	P	P	G
Castor oil	F	P	F	VG
Chlorobenzene*	F	P	F	P
Chloroform*	G	P	P	F
Chloronaphthalene	F	P	F	F
Chromic acid (50%)	F	P	F	F
Citric acid (10%)	VG	VG	VG	VG
Cyclohexanol	G	F	G	VG
Dibutyl phthalate*	G	P	G	G
Diesel fuel	G	P	P	VG
Diisobutyl ketone	P	F	G	P
Dimethylformamide	F	F	G	G
Dioctyl phthalate	G	P	F	VG
Dioxane 27	VG	G	G	G
Epoxy resins, dry	VG	VG	VG	VG
Ethyl acetate*	G	F	G	F

Hand Protection Selection Guide

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The U.S. Department of Energy rates various gloves as being protective against specific chemicals. The ratings are abbreviated as follows: VG: Very Good; G: Good; F: Fair; P: Poor (not recommended). Chemicals marked with an asterisk (*) are for limited service.

Chemical	Neoprene	Latex/ Rubber	Butyl	Nitrile
Ethyl alcohol	VG	VG	VG	VG
Ethyl ether*	VG	G	VG	G
Ethylene dichloride*	F	P	F	P
Ethylene glycol	VG	VG	VG	VG
Formaldehyde	VG	VG	VG	VG
Formic acid	VG	VG	VG	VG
Freon 11	G	P	F	G
Freon 12	G	P	F	G
Freon 21	G	P	F	G
Freon 22	G	P	F	G
Furfural*	G	G	G	G
Gasoline, leaded	G	P	F	VG
Gasoline, unleaded	G	P	F	VG
Glycerin	VG	VG	VG	VG
Hexane	F	P	P	G
Hydrazine (65%)	F	G	G	G
Hydrochloric acid	VG	G	G	G
Hydrofluoric acid (48%)	VG	G	G	G
Hydrogen peroxide (30%)	G	G	G	G
Hydroquinone	G	G	G	F
Isooctane	F	P	P	VG
Kerosene	VG	F	F	VG
Ketones	G	VG	VG	P
Lacquer thinners	G	F	F	P
Lactic acid (85%)	VG	VG	VG	VG
Lauric acid (36%)	VG	F	VG	VG
Lineolic acid	VG	P	F	G
Linseed oil	VG	P	F	VG
Maleic acid	VG	VG	VG	VG
Methyl alcohol	VG	VG	VG	VG
Methylamine	F	F	G	G
Methyl bromide	G	F	G	F
Methyl chloride*	P	P	P	P
Methyl ethyl ketone*	G	G	VG	P
Methyl isobutyl ketone*	F	F	VG	P
Methyl metharcrylate	G	G	VG	F
Monoethanolamine	VG	G	VG	VG
Morpholine	VG	VG	VG	G
Naphthalene	G	F	F	G
Napthas, aliphatic	VG	F	F	VG
Napthas, aromatic	G	P	P	G

Hand Protection Selection Guide

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The U.S. Department of Energy rates various gloves as being protective against specific chemicals. The ratings are abbreviated as follows: VG: Very Good; G: Good; F: Fair; P: Poor (not recommended). Chemicals marked with an asterisk (*) are for limited service.

Chemical	Neoprene	Latex/ Rubber	Butyl	Nitrile
Nitric acid*	G	F	F	F
Nitric acid, red and white fuming	P	P	P	P
Nitromethane (95.5%)*	F	P	F	F
Nitropropane (95.5%)	F	P	F	F
Octyl alcohol	VG	VG	VG	VG
Oleic acid	VG	F	G	VG
Oxalic acid	VG	VG	VG	VG
Palmitic acid	VG	VG	VG	VG
Perchloric acid (60%)	VG	F	G	G
Perchloroethylene	F	P	P	G
Petroleum distillates (naphtha)	G	P	P	VG
Phenol	VG	F	G	F
Phosphoric acid	VG	G	VG	VG
Potassium hydroxide	VG	VG	VG	VG
Propyl acetate	G	F	G	F
Propyl alcohol	VG	VG	VG	VG
Propyl alcohol (iso)	VG	VG	VG	VG
Sodium hydroxide	VG	VG	VG	VG
Styrene	P	P	P	F
Styrene (100%)	P	P	P	F
Sulfuric acid	G	G	G	G
Tannic acid (65)	VG	VG	VG	VG
Tetrahydrofuran	P	F	F	F
Toluene*	F	P	P	F
Toluene diisocyanate (TDI) 28	F	G	G	F
Trichloroethylene*	F	F	P	G
Triethanolamine (85%)	VG	G	G	VG
Tung oil	VG	P	F	VG
Turpentine	G	F	F	VG
Xylene*	P	P	P	F

Exhibit 8.8: Filter Lenses for Welding Selection Guide

The most current version of this Standard is available for download and use on the Parsons Corporate Policy Center.

Welding Process	Arc Current (Amperes)	Minimum Protective Shade	Suggested Protective Shade (Comfort)
Shielded Metal Arc Welding (SMAW)	Less than 60	7	—
	60 to 160	8	10
	160 to 250	10	12
	250 to 550	11	14
Gas Metal Arc Welding (GMAW) (MIG)	Less than 60	7	—
	60 to 160	10	11
	160 to 250	10	12
	250 to 550	10	14
Gas Tungsten Arc Welding (GTAW) (TIG)	Less than 50	8	10
	50 to 150	8	12
	150 to 500	10	14
Air Carbon (light) Air Carbon (heavy)	Less than 500	10	12
	500 to 1,000	11	14
Plasma Arc Welding (PAW)	20 to 100	8	10
	100 to 400	10	12
	400 to 800	11	14
Plasma Arc Cutting (PAC)	Less than 300	8	9
	300 to 400	9	12
	400 to 800	10	14
Carbon Arc Welding (CAW)	—	—	14
MIG = metal inert gas TIG = tungsten inert gas			

Exhibit 8.9: Laser Safety Lenses Selection Guide

The most current version of this Standard is available for download and use on the Parsons Corporate Policy Center.

Laser Safety Goggles

Workers with exposure to laser beams must be furnished with suitable laser protection. Laser safety goggles must provide protection against the specific energy involved. When lasers emit radiation between two measures of power density (or light blocking capability), lenses that offer protection against the higher of the two intensities must be offered.

All laser safety goggles must be labeled with the laser wavelengths for intended use, optical density (OD) of the wavelengths, and visible light transmission.

Laser safety equipment energy protection densities:

Intensity, CW maximum power density (watt/cm^2)	Attenuation	
	Optical Density	Attenuation Factor
0.01 (10^{-2})	5	10^5
0.1 (10^{-1})	6	10^6
1.0	7	10^7
10.0	8	10^8

Exhibit 8.10: Drowning Protection Guide

The most current version of this Standard is available for download and use on the Parsons Corporate Policy Center.

Parsons selects personal flotation devices (PFDs) and requires employees to wear them when work is conducted in areas where the danger of drowning exists (e.g., on, over, or alongside the water). Employees are not required to wear PFDs when:

- Water is known to be less than chest high.
- Employees are working behind standard height and strength guardrails.
- Employees are inside operating cabs or stations that eliminate the possibility of accidentally falling into the water.
- Employees are wearing an approved safety belt with a lifeline attached that prevents the possibility of accidentally falling into the water.
- PFD types must be approved by the United States Coast Guard (USCG) PFDs. Ski belts or inflatable type PFDs are prohibited.

Note: A rescue device, such as a ring buoy, with 90 feet of line must be kept in close proximity to the actual work site in order to be accessed in case of an emergency. Distance between ring buoys may not exceed 200 feet.

1. Purpose

This procedure describes Parsons' process, tools, roles, and responsibilities for signs, labels, barriers, signals, and traffic control.

2. Scope

This procedure applies to Parsons Corporation and all Parsons' businesses and subsidiaries worldwide, including joint ventures and similar partnerships managed by Parsons.

3. References

3.1. 29 CFR 1910.144, 1910.145, 1910.335(b), 1910.1201

3.2. 29 CFR 1926, Subpart G

3.3. EM 385-1-1, Safety – Safety and Health Requirements, Section 8, Accident Prevention Signs, Tags, Labels, signals, Piping System Identification, and Traffic Control

3.4. *Parsons ESHARP Guidebooks, Volumes I & II*

3.5. Project Document/Records Management Procedures

4. Procedures

4.1. Signs and Labels

4.1.1. Signs must point out a hazardous condition, notify persons to proceed with caution, or provide instruction, direction, or information.

4.1.2. Entrances to hazardous areas, e.g. spills, leaks, wet floors, fumes, or x-rays, require signage.

4.1.3. Use correct signs for each situation or condition, and remove them when the hazard is eliminated.

4.1.4. Post legible traffic signs at points of hazard in construction areas. Post acceptable speed limits at all curves.

4.1.5. Use signs in the following instances, in accordance with applicable policies:

- Aerial lift operation
- Asbestos and lead abatement
- Blasting locations
- Closed roads
- Concrete lift-slab
- Confined spaces
- Energized circuits or power lines
- Equipment under repair
- Exits

- Flammable storage
- Heavy equipment work areas
- High noise areas
- Powder actuated tools
- Pressure vessel test areas
- Underground access openings
- Unstable excavations
- Waste disposal vertical drop areas

4.1.6. Signs must adhere to the following requirements:

4.1.6.1. Use danger signs where an immediate hazard exists. Danger signs have red as the predominant color with the word “DANGER” printed on them.

4.1.6.2. Use caution signs to warn against potential hazards or to caution against unsafe practices. Caution signs have yellow as the predominant color with the word “CAUTION” printed on them.

4.1.6.3. Informational signs have blue as the predominant color.

4.1.6.4. Exit signs must have the word “EXIT” in plainly legible letters greater than 6 inches high. Every exit sign must be distinctive in color and provide contrast with decorations, interior finish, or other signs.

4.1.6.5. Safety instruction signs are white with a green upper panel with white letters to convey the principal message. Any additional wording on the sign is in black letters on the white background.

4.1.6.6. The wording of any sign must be concise and easy to read.

4.1.6.7. Signs required to be seen at night must be lighted or reflectorized.

4.1.7. Use accident prevention tags as a temporary means of warning employees of an existing hazard, such as defective tools, equipment, etc. They are not used in place of signs.

4.1.8. Identify piping systems (including pipes, fittings, valves, and pipe coverings), and identify asbestos-containing materials and/or presumed asbestos-containing materials, in accordance with the Asbestos and Lead procedure.

4.1.9. Use specific hazard-warning signs or labels to identify radio frequency (RF) radiation hazards, lasers, and ionizing radiation sources.

4.1.10. Label, tag, or mark hazardous material containers in accordance with the Hazard Communication policy.

4.2. Barricades

4.2.1. Designated persons responsible for erecting the barricades must specify the authorized personnel and/or necessary Personal Protective Equipment (PPE) to enter the barricaded area.

4.2.2. Barricades must completely enclose areas of a more hazardous nature and must cover enough space to properly protect personnel.

4.2.3. Place barricades no less than 6 feet from the hazard.

4.2.4. When a hazardous condition develops that warrants a barricade, post designated persons at area entrances to warn or exclude traffic until the area can be properly posted.

4.2.5. Use warning signs in conjunction with barricaded areas.

4.2.6. Do not use material provided as barricade equipment for any other purposes.

4.2.7. Use tape or rope colors for the following barricade categories:

4.2.7.1. Red tape: imminent danger areas (keep out)

4.2.7.2. Yellow tape or rope: use caution before entering (proceed with caution)

4.2.7.3. Purple and yellow tape: radiation area (keep out)

4.3. Fencing

4.3.1. Provide temporary project fencing for all projects located in areas of active use by the public. Also, consider those areas near family housing areas and/or school facilities.

4.3.2. Post signs warning of the presence of construction hazards and requiring unauthorized persons to keep out of the construction area on all fenced sides and space them at one sign every 300 feet.

4.3.3. For areas of minimal public exposure, fencing is not required; post signs warning of construction hazards.

4.3.4. Barricaded areas, or areas where “keep out” signs are posted, are to be entered only with specific permission from those working in the area, supervision responsible for work, or from persons posted as a “Safety Guard.” When personnel are given permission to enter a barricaded area, they must follow these practices:

4.3.4.1. Observe carefully for hazards.

4.3.4.2. Wear prescribed protective equipment.

4.3.4.3. You are responsible for your own safety.

4.3.4.4. Take extra precaution while in the area.

4.3.4.5. Leave the barricaded area as quickly as possible.

4.3.4.6. Never remove barricades or signs without permission from the designated person.

4.4. Heavy Equipment Barricades

4.4.1. When the level of the rotating superstructure of a crane, excavator, pile driving rig, or other similar equipment is less than 7 feet above the support mats or ground level, barricade the swing radius in a manner to visually alert an employee of the hazard of being struck or crushed by the equipment.

4.4.2. Use the barricade as a warning of the hazardous condition. It is not necessarily a physical barrier intended to prevent entry; it is a warning of a hazard, and all employees are trained to respect it as such.

4.4.2.1. All crane barricades conform to a standard handrail height of 42 inches as often as is practical.

4.4.2.2. If the project manager determines that a crane, excavator, or pile driving rig is to be stationed at one location for a long period, a semipermanent guardrail built of lumber or steel is the most suitable and requires the least maintenance.

4.4.2.3. For cranes, excavators, backhoes, and pile driving rigs that frequently move to different locations, it is recommended that barricades be attached to the body of the equipment. This guarantees that the barricade is always available and eliminates the time-consuming collection and erection of barricades each time the equipment is moved.

4.5. Signaling and Flaggers

4.5.1. Use flaggers or other appropriate traffic controls when signs, signals, and barricades do not provide necessary protection from traffic at operations on, or adjacent to, a highway or street.

4.5.2. Use certified flaggers only when other reasonable traffic control methods do not adequately control traffic in the work zone. Personnel who have not completed a flagger training course may be assigned duties as flaggers only during emergencies and only until a certified flagger can be put into the position.

4.5.3. Flagger signaling must conform to the guidelines of the Federal Highway Administration's MUTCD. Use approved sign paddles or lights for flagger hand signaling. During emergency situations, red flags may be used to draw a driver's attention to particularly hazardous conditions.

4.5.4. A flagger must wear the following required PPE:

4.5.4.1. Class II High-visibility fluorescent vest for day time work, Class III high-visibility fluorescent vest for night work.

4.5.4.2. High-visibility hard hat

4.5.4.3. Class III High-visibility pants (at night or when snow or fog limits visibility)

4.6. Flagger Protection

4.6.1. When it is not possible to position flaggers to eliminate traffic exposure, the designated person develops and implements a method to ensure that flaggers have adequate warning of traffic and equipment approaching from behind. The following are examples of methods that may be used to warn flaggers:

4.6.1.1. Mount a mirror on the flagger’s hard hat

4.6.1.2. Use a motion detector with an audible warning

4.6.1.3. Use a spotter

4.6.1.4. Use “jersey” barriers

4.6.2. For all flagging operations, a three-sign advance warning sequence is required on all roadways with a speed limit below 45 mph. A four-sign advance warning sequence is required on all roadways with a speed limit of 45-mph or higher. The following table shows the required spacing for advance warning sign placement.

	Distances Between Advance Warning Signs (feet)			
Road Type	**A**	**B**	**C**	**D**
Urban low speed	200	200	200	NA
Urban high speed	350	350	350	350
Rural	500	500	500	500
Expressway/freeway	1,000	1,600	2,600	2,600

4.6.3. Flagger workstations must be illuminated by floodlights during hours of darkness:

4.6.3.1. In no case can floodlighting be permitted to create a disabling glare for drivers. The adequacy of floodlight placement and elimination of potential glare can best be determined by driving through and observing the floodlit area from each direction on the main roadway after initial floodlight setup.

4.6.3.2. Emergency situations are exempt from illumination requirements. For this rule, “emergency” means an unforeseen occurrence endangering life, limb, or property.

4.6.4. Flaggers are not assigned other duties while engaged in flagging activities.

4.6.5. Flaggers do not use devices (e.g., cell phones, pagers, radio headphone) that may distract their vision, hearing, or attention. Devices used for communications between flaggers to direct traffic or ensure flagger safety are acceptable.

4.6.6. Flaggers must receive frequent breaks from flagging so they can remain attentive and alert.

4.7. Project Traffic Control Plan

4.7.1. When flaggers are used on a job that lasts more than 1 day, enact a project traffic control plan. The purpose of this plan is to help move traffic through or around the construction zone in a way that protects the safety of the traveling public, pedestrians, and workers.

4.7.1.1. The project traffic control plan is included in the project safety plan in accordance with *Parsons ESHARP Guidebook*, Volume I.

4.7.1.2. A qualified person develops and implements the traffic control plan in accordance with federal, state, and local regulations and this policy.

4.7.1.3. The project manager and Project Safety Health and Environmental Manager (PSHEM) facilitate implementation and compliance with the plan.

4.7.1.4. The designated person is responsible for overseeing the project traffic control plan and monitors the employees and subcontractors to ensure compliance.

4.7.1.5. Before beginning work on a Parsons project site, subcontractors must develop and implement a written traffic control plan and submit it to the project subcontracts manager for approval.

4.7.1.6. During the 2-week look-ahead, superintendents and supervisors notify the project manager of any work requiring traffic control to be conducted. The project manager adds the work to the schedule.

4.7.1.7. Traffic control devices, signs, and barricades must be set up and used according to the guidelines and recommendations in MUTCD.

4.7.1.8. Jobsite workers with specific traffic control responsibilities must be trained in traffic control techniques, device usage, and placement.

4.7.1.9. At a minimum, the project traffic control plan must include the following information:

- Name of the qualified person responsible for maintaining the program, and communicating program requirements to employees and other employers
- Name of designated person(s)
- Activity Hazard Analyses (AHAs) and daily huddles
- Provisions for inspections and surveillance
- Provisions for training
- Sign use and placement
- Application and removal of pavement markings
- Construction
- Scheduling
- Methods and devices for delineation and channelization
- Placement and maintenance of devices
- Placement of flaggers
- Roadway lighting

- Traffic regulations

4.8. Training

4.8.1. Parsons trains employees in the caution and warning methods used during work. Subcontractors must train their own employees.

4.8.2. The PSHEM arranges employee training at the time of initial assignment. Supervisors are responsible for identifying additional employee training needs during risk mitigation planning (2-week look-ahead) in accordance with *Parsons ESHARP Guidebook*, Volume I. Training can be organized and presented to groups or on a work area by work area basis, depending on the operation.

4.8.3. Supervisors instruct all employees in the recognition and avoidance of hazards delineated using signs and barriers during daily safety huddles.

4.8.3.1. Flagger Training Requirements

- Each flagger must be trained every 3 years on the MUTCD (in accordance with state certification requirements) and must carry a certification card.
- The PSHEM and/or supervisor in charge of work conducts an orientation that familiarizes the flagger with the jobsite each time the flagger is assigned to a new project, or when jobsite conditions change significantly.

4.8.3.2. Retraining

- Retraining is provided for employees when there is a change in their job assignments or a change in equipment or processes that present a new hazard.
- Additional retraining is conducted whenever there are deviations from, or inadequacies in, the employee's knowledge or use of proper procedures. The retraining re-establishes employee proficiency and introduces new or revised control methods and procedures, as necessary.
- Using an acceptable training form, the records custodian maintains a record of all training or instruction given to employees.

4.9. Documentation

4.9.1. The records custodian documents all instruction and training. The PSHEM maintains these records at the site for the duration of the project and archives the records at project close.

5. Definitions

Term	Definition
Barricade	An obstruction to deter the passage of persons or vehicles.
Emergency	An unforeseen occurrence endangering life, limb, or property.
Signs	A warning of a hazard, temporarily or permanently affixed or placed, at locations where hazards exist.
Signals	A moving sign provided by workers (e.g., flaggers) or by devices (e.g., flashing lights) to warn of possible or existing hazards.

Term	Definition
Tags	A temporary sign, usually attached to a piece of equipment or part of a structure, to warn of existing or immediate hazards.

6. Responsibilities

6.1. **Corporate Director, SHE&Sustainability:** Responsible for developing and maintaining this procedure and conducting periodic reviews and updates to ensure alignment and integration with related or referenced policies and procedures; coordinating reviews by individuals and organizations responsible for and supported by implementation, including resolution of comments received; developing training materials, forms, and templates necessary to implement the procedure; and providing safety subject matter expertise and guidance to help ensure the success of this procedure.

6.2. **Business SH&E Director:** Responsible for providing support to ensure the success of this procedure and auditing its effectiveness.

6.3. **Project Manager (PM):** Ultimately responsible for delivering the project and assigning roles and responsibilities to discipline managers and the Project Management Team; facilitating implementation and enforcing the project traffic control plan; designating person(s) to conduct activities within the traffic control plan; determining barricade requirements for heavy equipment; and adding work requiring traffic control to the schedule.

6.4. **Records Custodian:** Responsible for documenting employee training and serving as records custodian, maintaining and archiving related documentation.

6.5. **Superintendent:** Responsible for facilitating compliance with and enforcement of this procedure and notifies the project manager of any work requiring traffic control to be conducted during the 2-week look-ahead.

6.6. **Project Safety Health and Environmental Manager (PSHEM):** Responsible for developing, monitoring and assisting in the implementation of this procedure on the jobsite; conducting orientations for subcontractors and new employees; determining training needs and coordinating training for affected employees; providing the regulatory expertise to ensure that activities are conducted in compliance with the applicable codes, standards, and regulations; and ensuring that AHAs are performed.

6.7. **Foreman/Supervisor:** Responsible for supervising work and enforcing this procedure; conducting daily safety huddles emphasizing safety during work; supervising work and enforce this procedure; notifying the project manager of any work requiring traffic control to be conducted during the 2-week look-ahead; and conducting daily safety huddles emphasizing the recognition and avoidance of hazards delineated using signs and barriers.

6.8. **Designated Person(s):** Responsible for specifying requirements to enter barricaded areas; warning or directing traffic during emergencies; developing and implement flagger warning method; and overseeing and ensuring compliance with the project traffic control plan.

6.9. **Employees:** Responsible for complying with the requirements of this procedure.

6.10. **Subcontractors:** Responsible for complying with all Parsons' requirements; and training their own employees in applicable Parsons' procedures.

7. Exceptions

7.1. The PM may request or require a more stringent process if required by the contract or is beneficial to the project.

7.2. This procedure does not address Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD), U.S. Department of Transportation (DOT), or state and local transportation or traffic control requirements.

8. Revision History

Revision	Changes	Approver	Approval Date
1	Update Approver	Beck, Gregory	2/13/2019
0	Original Issue	Barber, Brad	2/20/2015

1. Purpose

This procedure provides guidelines for monitoring, preventing, and training for cold stress and heat stress.

2. Scope

This procedure applies to Parsons Corporation and all Parsons' businesses and subsidiaries worldwide, including joint ventures and similar partnerships managed by Parsons.

3. References

3.1. ACGIH, Threshold Limit Values and Biological Exposure Indices, Latest Edition

3.2. EM 385-1-1, Safety – Safety and Health Requirements, Section 6.J, Hazardous Substances, Agents and Environments: Inclement Weather and Environmental Hazards; Section 6.K, Cumulative Trauma Prevention

3.3. *ESHARP Guidebook – Volume 1*

3.4. Project Document/Records Management Procedures

4. Procedures

4.1. Exposure Assessment

4.1.1. Project Safety Health and Environmental Manager (PSHEM) ensures that the Activity Hazard Analysis (AHAs) identify the jobs or tasks with exposure to extreme temperatures. Before beginning work, supervisors review relevant AHAs with employees during daily huddles.

4.1.2. If an AHA has identified potential thermal stress hazards for a project, job or task, the PSHEM assesses worker Personal Protective Equipment (PPE), acclimatization, and workloads and establishes work/rest regimens in accordance with the current applicable guidelines for thermal stress.

4.1.3. The PSHEM determines if an Industrial Hygienist (IH) must conduct an exposure assessment to thoroughly assess the hazards and recommend controls, and contacts the GBU SH&E Director for further guidance.

4.2. Heat Stress

4.2.1. Heat Stress Factors on individuals vary based on their susceptibility to heat stress. The following factors may predispose a person to heat stress:

- Age
- Alcohol and drug use
- Dehydration
- Diarrhea
- Chronic disease
- Infection

- Lack of physical fitness
- Lack of acclimatization
- Obesity
- Sunburn

4.2.2. Increased risk of excessive heat stress is directly influenced by the amount and type of PPE worn. PPE adds weight and bulk, severely reduces the body's access to normal heat exchange mechanisms (evaporation, convection and radiation), and increases energy expenditure.

4.2.3. The safe duration of work/rest periods is based on the following criteria:

4.2.3.1. Anticipated work rate

4.2.3.2. Ambient temperature and other environmental factors

4.2.3.3. Type of protective ensemble

4.2.3.4. Individual worker characteristics and fitness

4.3. Heat Stress Evaluation

4.3.1. The PSHEM conducts wet bulb globe temperature (WBGT) index monitoring for workers wearing the standard ensemble of permeable clothing e.g., standard cotton or synthetic work clothes, identified in Table 1 below:

4.3.1.1. WBGT index monitoring is based on air temperature, radiant heat, and humidity

4.3.1.2. Work/rest schedules are adjusted for work demands, clothing, and acclimatization

4.3.1.3. Exposure assessment by an IH and/or physiological monitoring is used for very heavy work conducted for more than half the work/rest period

4.3.2. The IH's exposure assessment for heat stress consists of a detailed task analysis and/or rational model of heat stress, in accordance with current applicable guidelines.

4.3.3. The PSHEM arranges physiological and behavioral monitoring for workers wearing clothing that differs from the standard ensemble in insulation value and/or wind and vapor permeability when the temperature in the work area is above 70^{o}F (21^{o}C).

4.3.4. Initially, the frequency of physiological monitoring depends on the air temperature adjusted for solar radiation and the level of physical work, in accordance with Table 1 - Physiological Monitoring Frequency Table. The duration of the work cycle is governed by the frequency of the required physiological monitoring.

Table 1 - Physiological Monitoring Frequency Table

Adjusted Temperature, °F (°C)[a]	Normal Work Ensemble[b]	Impermeable Ensemble
≥90° (≥32.2°)	After each 45 minutes of work	After each 15 minutes of work
87.5° to 90° (30.8° to 32.2°)	After each 60 minutes of work	After each 30 minutes of work
82.5° to 87.5° (28.1° to 30.8°)	After each 90 minutes of work	After each 60 minutes of work
77.5° to 82.5° (25.3° to 28.1°)	After each 120 minutes of work	After each 90 minutes of work
72.5° to 77.5° (22.5° to 25.3°)	After each 150 minutes of work	After each 120 minutes of work

For fit and acclimatized workers at work levels of 250 kilocalories/hour.

[a]Calculate the adjusted air temperature (ta adj) by using this equation:
ta adj F = ta F + (13 X % sunshine).
Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent of the time the sun is not covered by clouds that are thick enough to produce a shadow. (100% sunshine: no cloud cover and a sharp, distinct shadow; 0% sunshine: no shadows.)

[b]A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

4.3.5. Monitor the employee’s heart rate and count the radial pulse during a 30-second period as early as possible in the rest period.

4.3.5.1. If the heart rate exceeds 110 beats per minute (bpm) at the beginning of the rest period, shorten the next work cycle by one-third and keep the same rest period.

4.3.5.2. If the heart rate still exceeds 110 bpm at the next rest period, shorten the following work cycle by one-third.

4.3.6. Monitor the employee’s oral temperature. Use a clinical thermometer (3 minutes under the tongue) to measure the oral temperature at the end of the work period (before drinking).

4.3.6.1. If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period.

4.3.6.2. If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following work cycle by one-third.

4.3.6.3. Workers are not permitted to wear semi-permeable or impermeable garments when oral temperatures exceed 100.6°F (38.1°C).

4.3.7. If possible, monitor body water loss by measuring weight on a scale accurate to ± 0.25 lb at the beginning and end of each work day to ensure that the employee is taking enough fluids to prevent dehydration.

4.3.7.1. Weigh the employee while he is wearing similar clothing or, ideally, nude.

4.3.7.2. Ensure that body water loss does not exceed 1.5% total body weight loss in a workday.

4.4. Heat Stress Prevention

4.4.1. Preventing heat stress is particularly important because each instance causes a person to be more susceptible to additional heat injuries. An individual's exposure to heat stress must be discontinued when the following symptoms of excessive heat strain occur:

4.4.1.1. Sustained (several minutes) heart rate greater than 180 bpm, minus age in years, for individuals with normal cardiac performance.

4.4.1.2. Body core temperature greater than 101.3°F (38.5°C) for acclimatized personnel or greater than 100.4°F (38°C) for unacclimatized workers.

4.4.1.3. Recovery heart rate at 1 minute after a peak work effort is greater than 110 bpm.

4.4.1.4. Symptoms of sudden and severe fatigue, nausea, dizziness, or lightheadedness.

4.4.1.5. Profuse sweating sustained over hours.

4.4.1.6. Weight loss over a shift greater than 1.5% of body weight.

4.4.1.7. 24-hour urinary sodium excretion less than 50 millimoles.

4.4.2. To avoid heat stress, take the following steps to adjust work schedules:

4.4.2.1. Modify work/rest schedules according to monitoring requirements.

4.4.2.2. Mandate work slowdowns as needed.

4.4.2.3. Rotate personnel. Alternate job functions to minimize overstress or overexertion.

4.4.2.4. Add personnel to work teams.

4.4.2.5. Perform work during cooler hours of the day or at night if adequate lighting can be provided.

4.4.2.6. Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.

4.4.3. Body fluids of workers must be maintained at normal levels to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat: 8 fluid ounces (0.23 liter) of water must be ingested for approximately every eight ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water must be ingested to replace lost sweat. When heavy sweating occurs, the worker must increase fluid intake. The following strategies may be useful:

4.4.3.1. Maintain water temperature at 50°F to 60°F (10°C to 15.6°C).

4.4.3.2. Provide small disposable cups that hold about 4 ounces (0.1 liter).

4.4.3.3. Urge workers to drink 16 ounces (0.5 liter) of fluid (preferably water or dilute drinks) before beginning work.

4.4.3.4. Urge workers to drink at least one cup of fluid approximately every 15 minutes. A total of 1.5 to 2 gallons (5.5 to 8 liters) of fluid a day are recommended, but more may be necessary depending on body weight.

4.4.4. Encourage workers to maintain an optimal level of physical fitness as follows:

4.4.4.1. Acclimatize workers to site work conditions, i.e., temperature, protective clothing, and workload, as necessary.

4.4.4.2. Urge workers to maintain normal weight levels.

4.4.5. Provide cooling devices to aid natural body heat exchange during prolonged work or severe heat exposure. Cooling devices include cooling jackets, vests, or suits.

4.4.6. Where there is the potential for sunburn, provide employees with sunscreen with a sun protection factor (SPF) appropriate for their skin type and exposure.

4.5. Cold Weather Conditions

4.5.1. Cold weather conditions can be hazardous to the safety and health of employees, endanger the stability of the body system, and cause conditions such as hypothermia and frostbite. It is vitally important that adequate precautions be taken to alleviate the effect of cold environments and to ensure that personnel can work safely and efficiently.

4.5.2. Prevent the deep body temperature from dropping below 96.8°F (36°C) and the core temperature from dropping below 95°F (35°C). Prevent cold injury to body extremities.

4.6. Cold Stress Factors

4.6.1. The following factors may contribute to a cold injury:

- Age
- Contact with wetness or metal
- Exposure to high winds
- Exposure to humidity
- General health
- Inadequate clothing

4.6.2. The following physical conditions worsen the effect of cold exposure:

- Allergies
- Excessive drinking
- Excessive smoking
- Specific drugs and medicines
- Vascular disease (e.g., Raynaud's phenomenon, acrocyanosis)

4.7. Cold Stress Monitoring

4.7.1. The project manager designates persons responsible to conduct environmental monitoring at air temperatures below 45°F (7°C).

4.7.2. At air temperatures below 30°F (–1°C) measure and record the wind chill index at least every 4 hours. The equivalent wind chill temperature and frostbite precautions will be determined using Table 2 - Wind Chill Index.

4.7.3. In indoor workplaces, measure and record the wind speed at least every 4 hours when the rate of air movement exceeds 5 mph (2.2 meters per second [m/s]); in outdoor work situations, measure and record the wind speed with the air temperature.

4.7.4. The wind-chill index takes into account the wind velocity. If no anemometer is available, use the following to estimate wind speed:

4.7.4.1. 5 mph: light flag moves

4.7.4.2. 10 mph: light flag fully extended

4.7.4.3. 15 mph: raises newspaper sheet

4.7.4.4. 20 mph: causes blowing and drifting snow

Table 2 – Wind Chill Index

Cooling Power of Wind on Exposed Flesh Expressed as an Equivalent Temperature (under calm conditions)												
Estimated Wind Speed (in mph)	**Actual Temperature Reading (°F)**											
	50	**40**	**30**	**20**	**10**	**0**	**−10**	**−20**	**−30**	**−40**	**−50**	**−60**
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	−10	−20	−30	−40	−50	−60
5	48	37	27	16	6	−5	−15	−26	−36	−47	−57	−68
10	40	28	16	4	−9	−24	−33	−46	−58	−70	−83	−95
15	36	22	9	−5	−18	−32	−45	−58	−72	−85	−99	−112
20	32	18	4	−10	−25	−39	−53	−67	−82	−96	−110	−121
25	30	16	0	−15	−29	−44	−59	−74	−88	−104	−118	−133
30	28	13	−2	−18	−33	−48	−63	−79	−94	−109	−125	−140
35	27	11	−4	−20	−35	−51	−67	−82	−98	−113	−129	−145
40	26	10	−6	−21	−37	−53	−69	−85	−100	−116	−132	−148
Wind speeds greater than 40 mph have little additional effect	**LITTLE DANGER** in < hr. with dry skin. Maximum danger of false sense of security.				**INCREASING DANGER** Danger of freezing exposed flesh flesh within 1 minute.			**GREAT DANGER** Flesh may freeze within 30 seconds.				
	Trench foot and immersion foot may occur at any point.											

4.8. Cold Stress Engineering Controls

4.8.1. Use general or spot heating to increase temperature at the site.

4.8.2. If work is being performed with bare hands for 10 or more minutes, keep the worker’s hands warm by supplying warm air jets, radiant heaters, or contract warm heaters.

4.8.3. If the air velocity at the site is increased by the wind, draft, or ventilation equipment, shield the work area.

4.8.4. When fine work must be performed with bare hands for more than 10 to 20 minutes in an environment below 60.8°F (16°C), establish a means for keeping workers’ hands warm.

4.8.5. At temperatures below 40°F, cover metal handles of tools and control bars with thermal insulation.

4.8.6. When necessary, substitute, isolate, relocate, or redesign equipment and processes to reduce the cold stress.

4.8.7. Use power tools, hoists, cranes, and lifting aids to reduce the metabolic workload.

4.8.8. If work is performed continuously in an equivalent chill temperature of 30°F or below, supply heated warming shelters such as tents, cabins, automobiles, or trucks and encourage workers to use them.

4.9. Cold Stress Administrative Controls

4.9.1. Move work to warmer or less drafty areas whenever possible.

4.9.2. Employees working in air temperatures of 19.4°F (–7°C) or less must use Table 3 - Work/Warm-Up Schedule. Schedule work/rest periods and enforce scheduled work breaks as follows:

4.9.2.1. Allow frequent rest periods in warm environments to prevent cold stress disorders.

4.9.2.2. Allow workers to pace themselves and take extra work breaks when needed.

4.9.2.3. Schedule the coldest work for the warmest part of the day.

4.9.2.4. Provide relief workers for break times.

4.9.2.5. Avoid double shifts and overtime in cold environments.

4.9.2.6. Assign extra workers to highly demanding jobs.

Table 3 – Work/Warm-up Schedule

Air Temperature - Sunny Sky		No Noticeable Wind		Wind Speed (mph)							
				5		10		15		20	
°C (approx.)	°F	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
–26° to –28°	–15° to –19°	(Norm. Breaks)	1	(Norm. Breaks)	1	75	2	55	3	40	4
–29° to –31°	–20° to –24°	(Norm. Breaks)	1	75	2	55	3	40	4	30	5
–32° to –34°	–25° to –29°	75	2	55	3	40	4	30	5	Nonemergency work ceases	
–35° to –37°	–30° to –34°	55	3	40	4	30	5	Nonemergency work ceases		Nonemergency work ceases	
–38° to –39°	–35° to –39°	40	4	30	5	Nonemergency work ceases		Nonemergency work ceases		Nonemergency work ceases	
–40° to –42°	–40° to –44°	30	5	Nonemergency work ceases		Nonemergency work ceases		Nonemergency work ceases		Nonemergency work ceases	
–43° & below	–45° & below	Nonemergency work ceases		Nonemergency work ceases		Nonemergency work ceases		Nonemergency work ceases		Nonemergency work ceases	

1. Schedule applies to moderate to heavy work activity with warm-up breaks of 10 minutes in a warm location. For light to moderate work (limited physical movement), apply the schedule one step lower. For example, at –30°F with no noticeable wind (Step 4), a worker at a job with little physical movement will have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (Step 5).

2. The following is suggested as a guide for estimating wind velocity. If accurate information is not available:

   5 mph: light flag moves

   10 mph: light flag fully extended

   15 mph: raises newspaper sheet

   20 mph: blowing and drifting snow

   * Maximum work periods are expressed in minutes.

4.9.3. In accordance with the Substance Abuse procedure, neither sedative drugs nor alcoholic products, including cough medications containing alcohol, may be taken prior to work in cold environments. Alcohol dilates blood vessels near the skin surface, which increases heat loss and lowers body temperature. Sedatives interfere with the transmission of impulses to the brain.

4.9.4. Urge frequent intake of warm, sweet, caffeine-free, nonalcoholic drinks or soup provided at regular intervals.

4.9.5. Exclude workers from work in cold (30°F (–1°C) or below), if they are suffering from disease or taking medication that interferes with normal body temperature regulation or reduces tolerance to work in cold environments.

4.9.6. Terminate exposure to cold when severe shivering or exhaustion becomes evident.

4.9.7. At air temperatures of 36°F (2°C) or less, workers who become immersed in water (or sweat) or whose clothing becomes wet must immediately be provided a change of clothing and treated for hypothermia.

4.9.8. Workers with blood vessel abnormalities (e.g., Raynaud's phenomenon, acrocyanosis) must take extra precautions to avoid chilling.

4.9.9. Maintain protective supervision or a buddy system for those who work in temperatures below 20°F.

4.9.10. Allow new employees time to adjust to conditions before they work full-time in cold environments.

4.9.11. Arrange work to minimize sitting still or standing for long periods. Avoid unprotected metal chairs.

4.9.12. Reorganize work procedures to ensure that as much of a job as possible is performed in a warm environment.

4.10. Cold Weather Personal Protective Equipment

4.10.1. Include the weight and bulkiness of clothing when estimating work performance criteria.

4.10.2. Remove the outer layer of clothing when entering the heated shelter. Loosen the other layers to allow sweat to evaporate.

4.10.3. Parsons provides the following cold weather PPE:

4.10.3.1. Liners for hard hats.

4.10.3.2. Face protection. A face mask or scarf is vital when working in cold wind. A ski mask gives better visibility than a snorkel hood. Remove face protectors periodically to check for frostbite.

4.10.3.3. Special safety goggles to protect against ultraviolet light and glare are required in snow cover, which could cause eye exposure hazard.

4.10.4. When manual dexterity is not required, workers are provided thermally protective gloves when exposed to the following temperatures:

4.10.4.1. For sedentary work, 60.8°F (16°C) and below

4.10.4.2. For light work, 39.2°F (4°C) and below

4.10.4.3. For moderate work, 19.4°F (–7°C) and below

4.10.5. Because evaporative cooling increases the risk of cold injury, workers handling evaporative liquid (e.g., gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F (4°C) must take precautions to avoid soaking clothing or contact with skin.

4.10.6. In cold weather, the employee is responsible for dressing in clothing appropriate to the expected work conditions, as recommended below:

4.10.6.1. Clothing should fit loosely. Tight clothing of synthetic fabrics interferes with evaporation. It is important to preserve the air space between the body and the outer layer of clothing in order to retain body heat.

4.10.6.2. It is most important to protect the feet, hands, head, and face. The hands and feet are farthest from the heart and are cooled most easily. Keeping the head covered is important because as much as 40% of body heat is lost when the head is exposed to the elements.

4.10.6.3. Ensure that all clothing and equipment fits properly and does not interfere with circulation.

4.10.6.4. Clothing should be made of thin cotton, which helps evaporate sweat by absorbing it and bringing it to the surface.

4.10.6.5. The recommended first layer of clothing includes a cotton T-shirt and shorts or underpants under cotton and wool thermal underwear. Two-piece long underwear is preferred because the top can be donned and doffed as needed.

4.10.6.6. Socks with high wool content are best. When two pairs are worn, the inside sock must be smaller and made of cotton. If necessary, wool socks can also double for mittens.

4.10.6.7. Wool or thermal trousers are preferred; the best is either quilted or specially lined.

4.10.6.8. Belts are not recommended because they cut off the circulation at the waist. Suspenders are encouraged.

4.10.6.9. Trousers must fit over the top of the boot to prevent snow and ice from entering.

4.10.6.10. Boots must be felt-lined, rubber-bottomed, and leather-topped with a removable felt insole. Boots must be waterproofed and socks must be changed when they are soaked with sweat.

4.10.6.11. Wear a wool sweater over a cotton shirt. Wear tops worn in layers to ensure proper insulation.

4.10.6.12. An anorak or snorkel coat or arctic parka should fit loosely and should have a drawstring at the waist. The sleeves should fit snugly. A hood prevents the escape of warm air from the neck and also funnels the warm air past the face to provide slightly warmer breathing air. Wear a warm cap under the hood.

4.10.6.13. Employees whose clothing may become wet must wear an outer layer of clothing that is impermeable to water. If clothing is wet, the employee must change into dry clothes before entering a cold environment.

4.11. Training

4.11.1. Parsons trains supervisors and employees in prevention, recognition, and response of thermal stress. Subcontractors must train their own employees.

4.11.2. The PSHEM arranges employee training at the time of initial assignment and when a new hazard is introduced to the jobsite. This training can be organized and presented to groups or on a work area by work area basis, depending on the operation.

4.11.3. Supervisors brief employees on relevant AHAs and special work practices during daily huddles before beginning work.

4.11.4. Training includes the following topics:

- Appropriate first aid treatment and emergency response
- Recommended clothing practice
- Safe work practices for preventing thermal stress
- Signs and symptoms of impending thermal stress
- Warming and/or cooling procedures
- Work/rest schedules

4.11.5. Using an acceptable training form, the records custodian maintains a record of all training or instruction given to employees.

4.11.6. Further training information on signs and symptoms of thermal stress disorders and first aid treatment are included below.

4.12. Cold Stress Symptoms

4.12.1. Frostnip occurs when the face or extremities are exposed to cold wind, causing the skin to turn white.

4.12.2. Frostbite entails an excessive drop in tissue temperature resulting in damage. Symptoms of frostbite include:

- Skin discoloration to a white or grayish-yellow, progressing to reddish-violet, and finally black as tissue dies
- Pain may be felt at first, but subsides
- Blisters may appear
- Coldness and numbness of affected part

4.12.3. When the outer layer of skin becomes frostbitten, the skin has a waxy or whitish appearance and is firm to the touch (the skin underneath is still resilient). In cases of deep frostbite, the tissues are cold, pale, and solid. Frostbitten skin is highly susceptible to infection, and therefore gangrene. First symptoms are usually an uncomfortable sensation of coldness, followed by numbness. There may be a tingling, stinging, aching feeling or cramping sensation. The victim is usually unaware of the frostbite. The three degrees of frostbite are:

- First: Freezing without blisters or peeling
- Second: Freezing with blisters or peeling
- Third: Freezing with death to tissues and possibly of the deeper tissues

4.12.4. Hypothermia involves the lowering of the body’s core temperature. The symptoms include uncontrolled shivering fits, sense of cold, slow heartbeat, vague or slow speech, glassy stare, apathy, memory lapses, incoherence, drowsiness, cool skin, slow irregular breathing, sometimes irregular exhaustion, and fatigue after rest. Pain in extremities can be the first warning of overexposure.

4.12.5. Immersion foot occurs when the feet have been wet, but not freezing cold, for days or weeks. The primary injury is to the nerve and muscle tissue. Symptoms are numbness, swelling, or even superficial gangrene.

4.12.6. Trenchfoot results from exposure to moisture at or near the freezing point for one to several days. As with immersion foot, symptoms include swelling and tissue damage.

4.13. Cold Stress Response

4.13.1. Call for medical help in accordance with the First Aid procedure.

4.13.2. Frostbite

- Never rub the affected area. Rubbing may cause further damage to soft tissue.
- Warm the area gradually by soaking it water. Start with cold water and warm it about every 5 minutes by adding water that is 5°F warmer. Do not immerse the affected part in water that is more than 105°F. If a thermometer is not available, test the water temperature with your hand. If the water temperature is uncomfortable, it is too hot.
- Keep the affected area under water until it looks red and feels warm.
- Loosely bandage the area with dry, sterile dressing. If fingers and toes are frostbitten, place cotton or gauze between them before the loose bandage.
- Do not break blisters.
- Get professional help immediately.

4.13.3. Hypothermia

- If an employee becomes fatigued while working, remove him to a warm environment and allow him to rest. As exhaustion approaches, the body experiences rapid loss of heat and the cooling process begins.
- Remove any wet clothing and dry the victim.
- Warm the body gradually by wrapping the victim in blankets or putting on dry clothing and moving the individual to a warmer place. Do not warm the body quickly by immersing the person in hot water. Rapid warming can cause dangerous heart problems. If available, apply heating pads or other heating source to the body. Keep a protective barrier, such as towel, blanket, or clothing between heat source and victim to avoid burning the victim.
- If the victim is alert, give him warm liquid to drink. Never give liquids to an individual who is unconscious or semiconscious.
- Handle the victim gently.

4.14. Heat Stress Symptoms

4.14.1. Dehydration is the loss or deficiency of water in body tissues. The condition may result from inadequate water intake and/or excessive removal of water from the body.

4.14.2. Heat rash results from continuous exposure to heat or humid air.

4.14.3. Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:

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

4.14.4. Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation because of cardiovascular insufficiency or dehydration. Signs and symptoms include:

- Pale, cool, moist skin
- Heavy sweating
- Dizziness
- Nausea
- Fainting

4.14.5. Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Take immediate action to cool the body before serious injury and death occur. Obtain competent medical help. Signs and symptoms include:

- Red, hot, usually dry skin
- Lack of or reduced perspiration
- Nausea
- Dizziness and confusion
- Strong, rapid pulse
- Coma

4.15. Heat Stress Response

4.15.1. Call for medical help in accordance with the First Aid procedure.

4.15.2. While waiting for help to arrive:

- Move the worker to a cool, shaded area
- Loosen or remove heavy clothing
- Provide cool drinking water
- Fan and mist the person with water

4.15.3. Include employees with heat stress in the medical monitoring program.

4.16. Documentation

4.16.1. The records custodian documents all instruction and training and maintains employee medical records and physiological monitoring records in employee files in accordance with the Medical Qualification and Surveillance procedure.

4.16.2. The PSHEM maintains project records at the site for the duration of the project and archives them at project close.

5. Definitions

Term	Definition
Acclimate	To accustom or become accustomed to a new climate, environment, or situation.
Activity Hazards Analysis (AHA)	A procedure, described in Parsons ESHARP Manual, used to identify the hazards or potential hazards associated with each step of a job or work plan to uncover hazards and then eliminate, control, or remove them before the work is started.
Anemometer	An instrument to measure wind speed.
Cold Stress	The disruption of the body's thermal balance as a result of exposure to cold.
Core Temperature	The temperature of the inner parts of the body, most accurately determined by measuring with a rectal thermometer.
Heat Stress	The total heat burden to which the body is subjected by both external and internal factors.
Industrial Hygienist (IH)	Scientist or engineer committed to protecting the safety, health, and environment of people in the workplace and the community. A certified industrial hygienist is accredited by the American Board of Industrial Hygienists (ABIH).
Wet Bulb Globe Temperature (WBGT)	A heat stress indicator that considers the effects of temperature, humidity, and radiant energy. The required inputs for the index are measured by a wet-bulb globe temperature meter.
Wind Chill Index	Cooling effect of any combination of temperature and wind velocity or air movement. The wind chill index does not take into account the body part exposed to cold, the level of activity effect on the body's heat production, and the amount of clothing worn.

6. Responsibilities

6.1. Safety Director, Corporate Safety, Health & Environment (SH&E): Responsible for developing and maintaining this procedure and conducting periodic reviews and updates to ensure alignment and integration with related or referenced policies and procedure; coordinating reviews by individuals and organizations responsible for and supported by implementation, including resolution of comments received; develops training materials, forms, and templates necessary to implement the procedure; and providing safety subject matter expertise and guidance to help ensure the success of this procedure; reinforce the need to comply with requirements; provide structure and training for safety programs.

6.2. GBU SH&E Director: Responsible for providing support to ensure the success of this procedure and auditing its effectiveness.

6.3. Project Manager (PM): Ultimately responsible for delivering the project and assigning roles and responsibilities to discipline managers and the Project Management Team; responsible for providing resources for, and ensuring compliance with, this element; designate persons to conduct environmental monitoring.

6.4. **Records Custodian:** Responsible for documenting employee training and serving as records custodian, maintaining and archiving related documentation.

6.5. **Superintendent:** Responsible for facilitating compliance with and enforcement of this procedure; identify jobs with temperature extremes.

6.6. **Project Safety Health and Environmental Manager (PSHEM):** Responsible for developing, monitoring and assisting in the implementation of this procedure on the jobsite; conducting orientations for subcontractors and new employees; determining training needs and coordinating training for affected employees; providing the regulatory expertise to ensure that activities are conducted in compliance with the applicable codes, standards, and regulations; ensuring that AHAs are performed; assess thermal stress hazards and determine appropriate (e.g., work/rest regimens) controls; conduct wet bulb globe temperature (WBGT) Index monitoring; arrange physiological and behavioral monitoring; coordinate training; and monitor program effectiveness.

6.7. **Foreman/Supervisor:** Responsible for supervising work and enforcing this procedure; conducting daily safety huddles emphasizing safety during work; identify potential hazards; confirm that jobs are properly evaluated for exposure hazards and that hazards are properly eliminated or controlled; review exposure hazards and controls with employees during daily huddles; ensure that employees adhere to preventive measures.

6.8. **Designated Person(s):** Responsible for conducting environmental monitoring.

6.9. **Employees:** Responsible for complying with the requirements of this procedure.

6.10. **Subcontractors:** Responsible for complying with all Parsons' requirements and training their own employees in applicable Parsons' procedures.

7. Exceptions

7.1. The PM may request or require a more stringent process if required by the contract or is beneficial to the project.

8. Revision History

Revision	Changes	Approver	Approval Date
0	Original Issue	Barber, Brad	8/27/2015

Policy

Parsons purchases, leases or rents vehicles as appropriate and necessary to support its projects, field operations and general business. Company vehicles are inventoried, requisitioned and procured through the Construction Fleet Manager in accordance with this policy and safety standards established and maintained by the Corporate Director of Safety. Currently owned asset inventory will be utilized to the greatest extent possible before new acquisition is considered.

Scope

This policy applies to Parsons Corporation and all Parsons' businesses and subsidiaries worldwide, including joint ventures and similar partnerships managed by Parsons.

Vehicles purchased and titled in a customer's name under a contract with that customer and short term rental cars rented through Parsons Travel accounts (e.g., Hertz, National, Budget, etc.) are exempt from this policy.

References

Fixed Assets Procedure

Fleet Safety Operating Policy

Definitions

- **Company Vehicle** is any licensed automobile, truck, or trailer which is purchased, leased or hired in Parsons' name for a period ≥ 30 calendar days.
  - Licensed vehicles ≤ 16,000 GVW (class 4) will be procured or leased by the Construction Fleet Manager and will be considered Parsons fleet vehicles. Final procurement or lease information for these assets will be captured by the Construction Fleet Manager for FIMS input.
  - Licensed vehicles > 16,000 GVW will be procured or leased by individual jobs on the advice of, and coordination with, the Construction Equipment Manager and will be considered job equipment. Final purchase information for these assets will be provided to the Construction Fleet Manager for FIMS data capture.
  - Procurement, lease or long term rental and divestiture of all vehicles in the Middle East should be in accordance with established procurement policy. The final purchase, lease or divestiture information for these vehicles will be forwarded to the Construction Fleet Manager for FIMS data capture.
  - Procurement of long term, "off airport" class 4 and below vehicles through fleet rental accounts will be managed by the Construction Fleet Manager and the cost will be passed through to the job.
- **Fleet Information Management System (FIMS)** is a centralized database used to capture specific vehicle information for all Parsons licensed, owned and leased vehicles and trailers and long term field rental vehicles regardless of GVW.

- **Vehicle Life Cycle** is the time frame that a vehicle is most cost effective and safe to own and which allows optimal return on investment to Parsons.
- **One Time Repair Limit** applies when one time needed repair(s) is ≥ 30% of the vehicles' fair market value and typically applies to vehicles that have exceeded life cycle parameters.

Responsibilities

- **Corporate Executive Vice President, Operations** provides executive sponsorship, leadership and direction in procurement and cost management.
- **Corporate Director of Safety** establishes operating guidelines for vehicle safety and fleet driver qualifications.
- **Construction Fleet Manager** is 1) responsible for all purchases or leases of company vehicles; 2) providing cradle to grave administrative inventory management oversight; 3) for monitoring and advising PM's regarding life cycle and repair determinations; 4) providing a comprehensive maintenance program (currently US only) and guidance to facilitate safe, economical fleet operations and which promotes Parsons public image standards; and, 5) for the efficient deployment, use and retirement of company vehicles.
- **Corporate and Business Unit Procurement Directors** are responsible for ensuring that all vehicles purchased or leased for the company or in the company's name are procured in accordance with this policy and approved by the Construction Fleet Manager. Purchase or lease information for vehicles outside the United States will be forwarded to the Construction Fleet Manager for capture in the Fleet Information Management System (FIMS).
- **Corporate and Business Unit Finance Directors** are responsible for ensuring that vehicles are appropriately added to fixed asset inventory and/or depreciated, amortized or expensed in accordance with the Fixed Asset Procedure.
- **Project Managers** may approve requisitions for field and construction vehicles that are reimbursable within the approved scope of a program or project contract and budget, and forward requisitions to the Construction Fleet Manager.
- **Sector Managers** may approve requisitions for non-reimbursable or overhead vehicles, and forward requisition to the Construction Fleet Manager.
- **Employees** are responsible for operating and maintaining vehicles in accordance with the Fleet Safety Policy.

Exceptions

The Corporate Executive Vice President, Operations may amend, modify or grant exceptions to this policy. All amendments, modifications or exceptions must be conveyed in writing.

Revision History

Revision	Changes	Approver	Approval Date
0	Original Issue	Harwood, Dean	11/20/2017

1. Purpose

This procedure describes the process, tools, roles, and responsibilities for maintaining a safe environment during construction work using walking-working surfaces such as floors, platforms, stairs, and walkways, including guardrail and toe-board systems.

2. Scope

This procedure applies to Parsons Corporation and all Parsons' businesses and subsidiaries worldwide, including joint ventures and similar partnerships managed by Parsons.

3. References

3.1. 29 CFR 1910.22, 1910.23, 1910.24, 1910.30

3.2. 29 CFR 1926.1052

3.3. EM 385-1-1, Safety – Safety and Health Requirements, Section 21, Safe Access and Fall Protection; and Section 24, Floor and Wall Holes and Openings

3.4. Fall Protection Procedure

3.5. Cranes, Hoist, and Lifts Procedure

3.6. *ESHARP Guidebook*, Volumes I & II

3.7. Project Document/Records Management Procedures

4. Procedures

4.1. Fall Protection

4.1.1. Before permitting employees to enter areas where fall hazards exist, the project manager ensures that 100% fall protection is provided in accordance with the Fall Protection Procedure.

4.1.2. Conventional fall protection systems, defined as a personal fall arrest system, guardrail system, or safety nets, are required for employees working in the following areas:

- Greater than 6 feet (1.8 m) from a lower level
- At the edge of excavations greater than 6 feet deep where excavations are not readily seen because of plant growth or other visual barrier, or that require employees to enter and be on the vertical wall of the excavation, on the protective system, or on any other structure in the excavation
- On access-ways or work platforms over water, machinery, or dangerous operations
- On runways from which they may fall 4 feet (1.2 m) or more

4.1.3. AHAs, conducted for jobs or tasks where means of access are used, must resolve the following issues:

- Design, construction, and maintenance of the means of access
- Erection and dismantling procedures

4.2. Floors and Platforms

4.2.1. Weight Capacity

- The qualified engineer assigns a maximum approved load to all elevated floors or platforms that could cause injury due to collapse. Floors that could be overloaded must be posted with the maximum approved load.

4.2.2. Floor Openings and Holes

- All floor openings and holes are barricaded or covered using one of the following methods:
  - Standard guardrail
  - Removable guardrail of standard construction
  - Floor cover of standard strength and construction
- If a floor hole cover is removed, or if other uncovered temporary floor holes exist, ensure that the openings are constantly attended or protected by a standard guardrail.
  - If falling tools or material could create a hazard, equip the guardrails with standard toe-boards.
- Protect hatchways and chutes by a hinged floor opening cover or railings that are fixed on at least two sides and removable on two or fewer sides.
- Guard skylight openings by a standard skylight screen or a fixed standard railing on all exposed sides.
- Equip walkways and bridges over excavations with standard guardrails. Provide adequate barriers at all excavations. Barricade or cover all wells, pits, shafts, etc.

4.2.3. Wall Openings and Holes

- Every wall opening from which there is a drop of more than 4 feet must be protected to prevent accidental falls and injuries from falling objects. Use one of the following methods to protect a wall opening:
  - Standard guardrail
  - Removable guardrail of standard construction
  - Rail, roller, picket fence, half door, or equivalent barrier
- If materials can fall through a wall hole, and the lower edge of the hole is less than 4 inches from the ground, use either of the following methods to protect the hole:
  - Toe-board
  - Enclosing screen of solid construction

4.2.4. Open-Sided Platforms or Floors

- All open-sided platforms or floors more than 4 feet (1.2 m) above the adjacent level must be guarded with standard railing.
- Provide toe-boards if there is a hazard from falling tools or material.

- If an open-sided platform or floor is adjacent to dangerous equipment (e.g. open chemical tanks), protect it with a standard guardrail, regardless of the elevation above the adjacent level.

4.2.5. Floor Covers

- Floor covers must cover all pit and trapdoor floor openings, and manhole floor openings.
- Covers must be capable of supporting, without failure, at least twice the maximum load expected to be over the cover at one time.
- Covers cannot project more than 1 inch above the floor level. The edges of all covers must be angled at 30 degrees or less. All hinges, handles, bolts or other parts must be flush with the floor or cover surface.
- To prevent accidental displacement by the wind, equipment, or employees, secure all covers when they are installed.
- Ensure that all covers are color coded or are marked with the word “HOLE” or “COVER” to warn of the hazard. This requirement does not apply to standard manhole covers or steel grates used in roadways.

4.2.6. Temporary Work Platforms/Walkways

- Make every effort to ensure that all temporary platforms/walkways, scaffolds, etc., regardless of height, are equipped with solid decks free of openings and with standard guardrail systems.
- Personnel working from temporary work platforms or walkways not equipped with guardrail systems must wear approved safety harnesses and have their lanyards properly secured at all times. Personnel who must lean through or over protective railings must also secure their lanyards.

4.3. Suspended Work Platforms

4.3.1. Must be part of the Project Manager approved Project Fall Prevention Plan (see Fall Protection Procedure).

4.3.2. Must only be used if other fall prevention is not practical or presents a greater risk.

4.3.3. Must be attached to an approved anchor point.

4.3.4. Must pass a pre-use check by a Competent Person which includes:

- Integrity of the platform
- Correct use and setup of the platform
- Be tested prior to first use of the day

4.3.5. Must in addition, if suspended from a crane, requires special approval (Cranes, Hoists, and Lifts) and:

- Must be operated by a Certified Crane Operator who must:
  - Confirm correct use and setup of the crane;
  - Perform a full cycle operational lift test before lifting workers

4.3.6. Workers on a suspended work platform must:

- Maintain two-way communication if using a crane suspended platform
- Maintain a balanced load inside the platform
- Look in the direction of travel when the work platform is moving
- Keep all body parts inside the work platform while it is moving
- Use three-way communication when there is more than one person inside the work platform
- Use a fall arrest system attached to an anchor point independent of the platform or fall restraint system anchored to the platform
- Attach the fall arrest system to an independent anchor point before leaving the platform

4.4. Workers on a loading or unloading platforms

4.4.1. On Transportation Equipment where a vertical opening greater than 19 inches (0.48 m) exists must use:

- Fall arrest system or fall restraint system, or
- Safeguards identified and approved by the Project Manager in the Fall Prevention Plan (Fall Prevention Procedure).

4.4.2. On a Marine Dock working within 6 feet (1.8 m) of a water hazard must use one or more of the following:

- Guardrail systems
- Fall restraint system
- Operating Discipline with Personal Flotation Device

4.4.3. Dockboards used for elevated work must:

- Be fitted with guardrails or handrails when there is an opening between the dock and the transportation equipment, unless:
  - Used only by motorized equipment, and
  - Fall distance is less than 10 feet (3.0 m)
- Support the weight placed upon it
- Be prevented from moving when in use
- Be fitted with edge protection if equipment could fall from the side

4.5. Floating Work Platforms

4.5.1. May not be used when:

- The tank contains a material or service that is a fire hazard, toxic, water reactive, unstable, corrosive, or temperature greater than 60 degrees C (140 F).
- The liquid in the tank would react with the components of the Floating Work Platform.
- Decontamination of the Floating Work Platform components would result in significant risk of exposure, loss of containment or environmental impact.
- The tank is a closed top tank.

4.5.2. Must have a procedure that includes:

- Methods for assembling and disassembling the platform
- Hazards and methods to mitigate the hazards
- Manufacturer's instructions for installation and use
- Fall prevention needed
- Methods used to change the elevation of the work platform including the isolation to prevent flow into or out of the tank when assembling or disassembling the platform
- Methods for controlling accumulation of liquid on the platform
- Methods for Isolation of the tank and all associated equipment
- Methods to prevent contamination of tank contents
- Methods to decontamination the platform components and to prevent environmental impact during disassembly
- Rescue methods to be used
- Approval by the Project Manager and Corporate Safety
- Required personal protective equipment
- Fall prevention and a personal flotation device (PFD) when assembling and disassembling the platform
- Specifications that workers must not be on the Floating Work Platform when the tank level is changing

4.6. Mobile Ladder Stands and Mobile Elevated Work Platforms

4.6.1. Be visually checked prior to use

4.6.2. Not be moved when the worker is on it

4.6.3. Be secured to prevent access when not in use if the platform has an opening through which a person may fall

4.7. Guardrails and Toe-boards

4.7.1. Standard Railing Specifications

- A standard guardrail has a top rail, intermediate rail, and vertical posts. The standard height of a guardrail is 42 inches from the upper surface of the top rail to the floor. Guardrails must meet the following requirements:
  - The ends of the top rail cannot create a hazard by extending beyond the terminal posts. The top rail must have a smooth surface.
  - For wooden railings, all components must be at least 2- by 4-inch stock. Vertical posts may not be spaced more than 6 feet (1.8 m) apart. If the top rail is made of two right-angle pieces of 1-by 4-inch stock, posts can be spaced 8 feet (2.4 m) apart.
  - All standard guardrails must be able to withstand 200 pounds applied in any direction along the top rail.

4.7.2. Guardrails

- Place guardrails on the open sides of all open-sided platforms, floors, or passageways that are 4 feet (1.2 m) or more above the adjacent level.
- Place guardrails on the open sides of all open-sided platforms, floors, or passageways that are above dangerous equipment, regardless of height.
- Guardrails can be removable, but equivalent protection must be in place while the railing is not in place.
- When used as falling object protection, ensure that all openings in the guardrail system are small enough to prevent passage of potential falling objects.

4.7.3. Stairway Railings

- Every flight of stairs having four or more risers must have a railing or handrail. Install railings or handrails in accordance with the following guidelines:
  - Stairways less than 44 inches wide, having both sides enclosed, must have at least one handrail or railing, preferably on the right side, descending.
  - Stairways less than 44 inches wide, having one side open, must have at least one railing on the open side.
  - Stairways less than 44 inches wide, having both sides open, must have one railing on each open side.
  - Stairways 44 to 88 inches wide must have one handrail on each enclosed side and one railing on each open side.
  - Stairways wider than 88 inches must have one handrail on each enclosed side, one railing on each open side, and one intermediate railing.
  - A stairway railing is similar to a standard guardrail, except the vertical height is 30 to 34 inches measured from the front of the tread.

  - A standard handrail (wall mounted) must be 30 to 34 inches high and smooth surfaced with no projection hazards. The brackets must be spaced no more than 8 feet apart. Handrails must be able to withstand 200 pounds (90.7 kg).

4.7.4. Toe-boards

- If materials could fall to lower levels, erect a removable toe-board along the edge of the overhead walking/working surface for a distance sufficient to protect employees below. Toe-boards must conform to the following requirements:
  - Toe-boards must be a minimum of 3½ inches high from the top edge to the level of the walking/working surface.
  - Toe-boards must have no more than ¼-inch clearance above the walking/working surface.
  - Toe-boards must be solid or must have openings of no more than 1 inch in the greatest dimension.
  - When materials are piled high enough to render a toe-board inadequate, paneling must be provided from the floor to the intermediate rail.
  - Toe-boards must be capable of withstanding a force of at least 50 pounds (22.7 kg).

4.8. Access-ways

4.8.1. Safe access must be provided to all work areas.

4.8.2. When a structure has only one means of access between levels, keep that means clear to permit free passage of employees. If work is performed in an area that restricts free passage, provide a second means of access.

4.8.3. Inspect access-ways daily and maintain them in a safe manner:

- Keep access-ways free of ice, snow, grease, mud, debris, or any other material or equipment that could obstruct passage or cause a tripping hazard.
- Where access-ways are slippery, use abrasive material to ensure safe footing.
- Ensure that all obstructions or projections into an access-way are removed or conspicuously marked. If an obstruction or projection may cause lacerations, contusions, or abrasions, it must be covered with protective material.
- Do not use access-ways that are damaged or weakened until they are repaired or replaced.

4.8.4. Aisles

- Areas with mechanical handling equipment must have sufficient safe clearance for aisles.
- Aisles must be at least 22 inches wide.
- Inclined walkways cannot be sloped more than 24 degrees and must have an adequate anti-slip surface.
- Permanent aisles and passageways must be appropriately marked.

4.8.5. Stairways

- Fixed stairways must be provided in the following circumstances:
    - Where there is exposure below to falling materials (also provide a removable toe-board or the equivalent).
    - Where daily access to elevations may expose employees to acids, caustics, gases, or other harmful substances.
    - Where equipment or tools are normally carried by hand.
- Stairways must be at least 22 inches wide.
- Riser height and tread depth should be uniform within each flight of stairs.
- Stairway platforms must be at least the width of the stairs and at least 30 inches long in the direction of travel. Platforms are recommended every 10th or 12th step.
- Stairways must be designed to carry five times the intended load or 1,000 pounds (454 kg), whichever is greater.
- There must be at least 7 feet (2.1 m) of vertical clearance above the stairway, measured from the leading edge of each tread.
- The slope of a stairway must be between 30 and 50 degrees. Stairway treads must be slip resistant.

4.9. Inspections

4.9.1. Mobile ladder stands, Guardrails, Grating platform and stair treads (steel and fiberglass) must be inspected by a Competent Person every three (3) years and after installation, repair or modification, and the inspection must:

- Check physical condition and orientation
- Confirm that grating is secure
- Mark each clip, bolt or weld that passed inspection
- Document the results, repairs and resolution

4.9.2. Loading and unloading platforms including railcar and tank truck platforms, gangways and load racks must be inspected by a Competent Person according to manufacturer's instructions or at least annually and documented.

4.10. Training

4.10.1. In accordance with the Fall Protection Procedure, provisions for training for each employee who might be exposed to fall hazards is included in the project fall protection plan.

5. Definitions

Term	Definition

Term	Definition
100% Fall Protection	The design and use of a fall protection system so that no exposure to an elevated fall occurs at any time. This may require more than one fall protection system, lanyard, or combination of preventive or protective measures.
Activity Hazards Analysis (AHA)	A procedure, described in Parsons' ESHARP Guidebook, used to identify the hazards or potential hazards associated with each step of a job or work plan to uncover hazards and then eliminate, control, or remove them before the work is started.
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
Competent Person	An individual who has successfully completed Grating Inspection and/or Fall Protection Training for the Competent Person and has the authority to take prompt corrective action.
Corporate Safety	Includes, but is not limited to: Senior Vice President – Safety, Health, Environment and Sustainability; Vice President – Safety, Health and Environment (SH&E); and SH&E Director
EM	Engineering Manuals
Floor Hole	An opening measuring greater than 1 inch but less than 12 inches in its least dimension in any floor, roof, or platform through which materials but not persons may fall (e.g., a belt hole, pipe opening, or slot opening).
Floor Opening	An opening measuring 12 inches or more in its least dimension in any floor, roof, or platform, through which persons may fall.
Guardrail System	A barrier erected to prevent employees from falling to lower levels.
Handrail	A rail used to provide employees with a handhold for support.
Infeasible	Not possible; that is, it is impossible to perform the construction work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or it is technologically impossible to use any one of these systems to provide fall protection.
Leading Edge	The edge of a floor, roof, or formwork for a floor or other walking/working surface (such as the deck) that changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered to be an "unprotected side and edge" during periods when it is not actively and continuously under construction.
Lower Levels	Areas or surfaces to which an employee can fall. Such areas or surfaces include ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.
Low-Pitched Roofs	Roof slopes (vertical to horizontal) greater than 4:12.
Mechanical Equipment	All motor- or human-propelled wheeled equipment except for wheelbarrows, mop carts, robotic thermoplastic welders, and robotic crimpers.

Term	Definition
Nose or Nosing	That portion of a stair tread projecting beyond the face of the riser immediately below.
Opening	A gap or void 30 inches (76 cm) high and 18 inches (48 cm) wide, in a wall or partition, through which employees can fall to a lower level.
OSHA	Occupational Safety & Health Administration
Platform	A walking/working surface for persons, elevated above the surrounding floor or ground (e.g., a balcony or platform for the operation of machinery and equipment).
Roof	The exterior surface on the top of a building. The roof does not include floors or formwork which, because a building has not been completed, temporarily becomes the top surface of a building.
Roofing Work	The hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck (nor leading edge work in Oregon).
Runway	A passageway for persons, elevated above the surrounding floor or ground level (e.g., a foot walk along shafting or a walkway between buildings).
Safety Monitoring System	A safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.
Stair Platform	An extended step or landing breaking a continuous run of stairs.
Stair rail System	A vertical barrier erected along the unprotected sides and edges of a stairway to prevent employees from falling to lower levels. The top surface of a stair rail system may also be a “handrail.”
Stairs or Stairways	A series of steps leading from one level or floor to another, or leading to platforms, pits, boiler rooms, crossovers, or around machinery, tanks, and other equipment that is used more or less continuously or routinely by employees or only occasionally by specific individuals. A series of steps and landings having three or more risers constitutes stairs or a stairway.
Standard Railing	A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.
Standard Strength and Construction	Any construction of railings, covers, or other guards that meets the requirements of this procedure.
Toe-board	A low protective barrier that prevents the fall of materials and equipment to lower levels and provides protection from falls for personnel.
Tread Depth	The horizontal distance from front to back of tread (excluding nosing, if any).
Unprotected Sides and Edges	Any side or edge (except at entrances to points of access) of a walking/working surface (e.g., floor, roof, ramp, or runway) where there is no wall or guardrail system at least 39 inches (1.0 m) high.
Wall Hole	An opening greater than 1 inch in the least dimension but not large enough to permit a person to fall.
Wall Opening	Opening large enough to permit a person to fall.

Term	Definition
Walking/Working Surface	Any surface, whether horizontal or vertical, on which an employee walks or works, including floors, roofs, ramps, bridges, runways, formwork, beams, columns, trusses, and concrete reinforcing steel. Walking/working surfaces do not include ladders, vehicles, or trailers on which employees must be located in order to perform job duties.
Warning Line System	A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and that designates an area in which roofing work may take place without the use of a guardrail, body belt, or safety net system to protect employees in the area.
Work Area	That portion of a roof where roofing work is being performed.

6. Responsibilities

6.1. **Corporate Safety:** Responsible for developing and maintaining this procedure and conducting periodic reviews and updates to ensure alignment and integration with related or referenced policies and procedure; coordinating reviews by individuals and organizations responsible for and supported by implementation, including resolution of comments received; develops training materials, forms, and templates necessary to implement the procedure; and providing safety subject matter expertise and guidance to help ensure the success and effectiveness of this procedure.

6.2. **Project Manager (PM):** Ultimately responsible for delivering the project and assigning roles and responsibilities to discipline managers and the Project Management Team; hold overall responsibility for this element; and provide the necessary personnel, facilities, and other resources.

6.3. **Records Custodian:** Responsible for documenting employee training and serving as records custodian, maintaining and archiving related documentation.

6.4. **Superintendent:** Responsible for facilitating compliance with and enforcement of this procedure and ensuring that access-ways are maintained and inspected daily.

6.5. **Project Safety Health and Environmental Manager (PSHEM):** Responsible for developing, monitoring and assisting in the implementation of this procedure on the jobsite; conducting orientations for subcontractors and new employees; determining training needs and coordinating training for affected employees; providing the regulatory expertise to ensure that activities are conducted in compliance with the applicable codes, standards, and regulations; and ensuring that AHAs are performed.

6.6. **Foreman/Supervisor:** Responsible for supervising work and enforcing this procedure; continuously monitoring the work to ensure compliance with this element; confirming that jobs are properly evaluated for fall hazards and that hazards are properly eliminated or controlled; and reviewing fall hazards and controls with employees during daily huddles.

6.7. **Employees:** Responsible for complying with the requirements of this procedure and being knowledgeable of fall hazards and applicable restricted areas and work practices.

7. Exceptions

7.1. The PM may request or require a more stringent process if required by the contract or is beneficial to the project.

8. Exhibits

None.

9. Revision History

Revision	Changes	Approver	Approval Date
1	Added 3.5, 4.3, 4.4, 4.5, 4.6, 4.9 and Corporate Safety Definition. Modified 4.2.2 and Competent Person Definition.	Beck, Gregory	4/2/2019
0	Original Issue	Barber, Brad	10/15/2015

1. Purpose

This procedure describes the process, tools, roles, responsibilities, requirements and recognized industry standards to ensure safe conduct of welding, cutting, and brazing operations including hot work.

2. Scope

This procedure applies to Parsons Corporation and all Parsons' businesses and subsidiaries worldwide, including joint ventures and similar partnerships managed by Parsons.

3. References

3.1 29 CFR 1910 Subpart Q

3.2 29 CFR 1926 Subpart Z

3.3 29 CFR 1926 Subpart J

3.4 EM 385-1-1, Safety – Safety and Health Requirements, Section 10, Welding and Cutting

3.5 National Fire Protection Association (NFPA)

3.6 National Electric Code (NEC)

3.7 *Parsons ESHARP Guidebook*, Volume I

3.8 Hazardous Material Handling, Transportation, Storage, and Disposal Procedure

3.9 Personal Protective Equipment Procedure

3.10 Tools Procedure

3.11 Confined Spaces Procedure

3.12 Respiratory Protection Procedure

3.13 Industrial Hygiene Monitoring Procedure

3.14 Electrical Safety Procedure

3.15 Fire Prevention and Protection Procedure

3.16 Emergency Management Procedure

3.17 Ventilation Procedure

3.18 Fall Protection Procedure

3.19 Process Safety Management Procedure

3.20 Control of Hazardous Energy Procedure

3.21 Project Document/Records Management Procedures

4. Procedures

4.1 Low and High Energy Hot Work

4.1.1 Low Energy Hot Work conducted in a Flammable Area must:

4.1.1.1 Have a permit or procedure

4.1.1.2 Conduct atmospheric monitoring for % LEL

- Initially
- As determined by the permit issuer if the atmosphere may contain flammable liquids or gas
- When working conditions have changed

4.1.2 High Energy Hot Work conducted in a Flammable Area must:

4.1.2.1 Have a permit

4.1.2.2 Have a Project Manager or delegate approver that: conducts an independent on-site inspection, approves the permit

4.1.2.3 When flammable materials are introduced (e.g., acetylene cylinders), check connections and hoses for leaks as part of the permit

4.1.2.4 Barricade the area when there is the potential for people who are not directly involved in the Hot Work to enter the area

4.1.2.5 Control fire hazard(s) by one or more of the following methods in preferred order:

- Use other practical means to complete the job, if applicable
- Move equipment to an Exempt Area
- Move combustible/flammable materials at least 35 ft (10.7 m) or more away from the Hot Work Area
- Guard or shield combustible/flammable materials. Types of guards include, but are not limited to, the following in preferred order:
- Spark containment structures using fire resistant tarp material free of residue and debris consisting of:
  - Four walls plus a floor if there are combustibles on the floor, and grating or openings on the floor must be covered to avoid sparks or slag reaching lower levels
  - Four walls if the floor is concrete, gravel or otherwise free of combustible materials
  - Water sprays on the potential source of flammable or combustible materials
  - Wetted tarps free of residue and debris on the potential source of flammable or combustible materials

4.1.2.6 Inspect all tools/equipment used as part of the Hot Work job prior to use to ensure conditions do not exist that could introduce sparks to the Hot Work area.

4.1.2.7 Prohibit activities, other than those introduced by the Hot Work, which can generate flammable atmospheres that can reach Hot Work ignition sources until Hot Work is complete.

4.1.2.8 Conduct atmospheric monitoring for % LEL if bordering a Flammable Area:

- Initially
- Continuously throughout the Hot Work activities
- When working conditions have changed

4.1.2.9 A Fire Watcher is required – see Section 4.9

4.1.2.10 Fire Extinguishing Equipment per 4.8.6

4.1.3 High Energy Hot Work conducted in a General Area must follow Hot Work in Flammable Area except as noted below:

4.1.3.1 Hot Work in a General Area, must have permit or procedure, and a secondary approver is not required.

4.1.3.2 Atmospheric monitoring for % LEL if bordering a Flammable Area:

- Initially
- As determined by the permit issuer
- When working conditions have changed

4.1.4 High Energy Hot Work conducted in a Exempt Areas that borders a Flammable Area:

4.1.4.1 Safe Work Permit is not required for Exempt Areas and the following actions are required for safe Hot Work in an Exempt Area bordering a Flammable Area:

- Guard the hot work area to minimize contact of flammable or combustible materials with the source of ignition. Types of guards include, but are not limited to, the following in preferred order:
- Spark containment structures using fire resistant tarp material free of residue and debris consisting of:
  - Four walls plus a floor, if there are combustibles on the floor, and grating or openings on the floor must be covered to avoid sparks or slag reaching lower levels
  - Four walls if the floor is concrete, gravel or otherwise free of combustible materials
  - Water sprays on the potential source of flammable or combustible materials
  - Wetted tarps free of residue and debris on the potential source of flammable or combustible materials
- When flammable materials are introduced (e.g., acetylene cylinders), check connections and hoses for leaks
- Inspect all tools/equipment used as part of the Hot Work job prior to use to ensure conditions do not exist that could introduce sparks to the Hot Work area
- Conduct atmospheric monitoring for % LEL:

- Initially
- As determined by the permit issuer
- When working conditions have changed

- Fire Extinguishing Equipment per 4.8.6

4.2 Hot Work Permit

4.2.1 Each shift, supervisors complete and submit a Hot Work Permit (Exhibit 8.1) for all hot work activities that are not conducted in designated welding areas, establishing that precautions have been taken in order to safely perform the task. Hot Work Permits and Hot Work Procedures must include:

4.2.1.1 The Area Classification (e.g., Hot Work Flammable Area, Hot Work Restricted Area, Hot Work General, Hot Work Exempt)

4.2.1.2 Location of the Hot Work

4.2.1.3 Status of the line or equipment to be worked on

4.2.1.4 The flammable and/or combustible material(s) within the area and those last contained in the equipment

4.2.1.5 Other materials that can generate pressure increase or hazardous vapors upon heating

4.2.1.6 Equipment corrosion that can generate flammable materials

4.2.1.7 The method to clear the contents from equipment when there is potential for flammable materials trapped behind liners or in dead legs

4.2.1.8 If atmospheric monitoring is conducted, the following will be included:

- Date and time
- Name of person performing the monitoring
- Location of monitoring
- Frequency of monitoring
- Level of flammables detected (%LEL)

4.2.1.9 Secondary approval

4.2.2 The Project Safety, Health & Environment Manager (PSHEM) or designated representative reviews and approves only after they have checked the work area and has ensured that the necessary precautions have been taken as designated on the permit. The PSHEM conducts a further check as required for flammable gases, dust, and oxygen using the appropriate instruments.

4.2.2.1 Before starting the task, the employee performing the hot work examines the work site, following Step 1 of the permit. The employee then signs Step 1 confirming inspection of the site.

4.2.2.2 The PSHEM or designated representative inspects the site to ensure compliance with all precautions listed on the hot work permit and that no other exposures exist before work is approved. The PSHEM suspends hot work operations when necessary to ensure safe conditions.

4.2.2.3 The hot work permit is posted in a conspicuous location in or adjacent to the work site for the duration of the job or shift.

4.2.2.4 The PSHEM periodically visits the work site during the job to evaluate the conditions that were originally authorized by the permit.

4.2.2.5 When the job and final checkup are complete, the supervisor returns the permit to the PSHEM.

4.2.2.6 The hot work permit becomes void when the following conditions exist:

4.2.2.7 At the end of each shift. If the work is to continue, a new permit is issued.

4.2.2.8 When conditions change significantly, unless the PSHEM or designated representative approves the change in writing.

4.3 General Precautions

4.3.1 Welding and cutting are performed only by experienced and properly trained persons.

4.3.2 During advanced pre-planning and the 2-week look-ahead, superintendents and supervisors notify the project manager of any hot work to be conducted. The project manager adds the work to the schedule and initiates an Activity Hazard Analysis (AHA) and evaluates the following:

4.3.2.1 Determines the Hazardous Area Classification and if temporary reclassification prior to starting Hot Work is required as work in a Flammable area may require a Management of Change approval per Process Safety Management Procedure;

4.3.2.2 Hot Work will not occur in a Restricted Area;

4.3.2.3 If Hot Work is in an area where fire protection systems are impaired, then identify additional precautions for safe work.

4.3.3 AHAs describe the safe work practices required for fire prevention, Personal Protection Equipment (PPE), and equipment to be used, in accordance with the Personal Protective Equipment Procedure.

4.3.4 All tools and equipment must be inspected prior to their use in accordance with the Tools Procedure. Worn or damaged hoses, welding leads, and other equipment with defects that affect safe operation cannot be used and must be reported and repaired by the maintenance mechanic.

4.3.5 The superintendent ensures that a record of all equipment on site is maintained and periodic maintenance is performed to ensure the equipment's continued safe operation.

4.3.6 If unusual service conditions exist, equipment is designed to safely meet requirements of the following exposure conditions:

4.3.6.1 Abnormal vibration or shock

4.3.6.2 Adverse weather

4.3.6.3 Excessive dust

4.3.6.4 Excessive oil vapor

4.3.6.5 Flammable gases

4.3.6.6 Steam or excessive humidity

4.3.6.7 Unusual corrosive fumes

4.3.7 Welders and their helpers are not allowed to carry matches when engaged in welding or cutting operations.

4.3.8 Welders must place welding cable, hoses, and other equipment so that it is clear of passageways, ladders, and stairways.

4.3.9 After welding or cutting operations are completed, the welder marks the hot metal or provides other means of warning other workers.

4.3.10 Before welding, cutting, or heating any material covered by a coating whose flammability is unknown, the qualified person conducts a test to determine its flammability and chemical makeup.

4.3.11 When the electrode holder is not in use, be sure to remove the welding rod.

4.3.12 Do not hold heating tip or “rosebud” too close to metal being heated or burned. The tip of the flame should be close enough to touch work piece without distorting shape of the blue cone portion of the flame.

4.3.13 When metal coatings are highly flammable, the assigned worker (welder or fitter) removes them from the area to be heated in order to prevent ignition. The assigned worker strips all coated surfaces of the coating for a distance of at least 4 inches on each side of the cut or weld and takes the following precautions when metal coatings are determined to be toxic:

4.3.13.1 Hazardous Areas: In dusty or gaseous spaces where flammable or combustible materials, liquids, gases, vapors, or dusts create the possibility of an explosion, welding or cutting equipment cannot be used until the space is adequately ventilated.

4.3.13.2 Enclosed Spaces: Welding and cutting in enclosed spaces must conform to requirements of the Confined Spaces Procedure.

4.3.13.3 Open Air: Employees in open air must be protected by either an air line respirator, an appropriate respirator meeting the respiratory protection requirements, or use of adequate ventilation.

4.4 Gas Welding and Cutting

4.4.1 Use only approved gas welding or cutting equipment.

4.4.2 Handle and store compressed gas cylinders in accordance with the Hazardous Material Handling, Transportation, Storage, and Disposal Procedure.

4.4.3 Use approved backflow check valves on gas welding rigs in both gas and oxygen lines.

4.4.4 Do not repair welding hose with tape.

4.4.5 Do not use matches to light a torch; do not light a torch on hot work; use a friction lighter or other approved device.

4.4.6 Do not take oxygen or fuel gas cylinders into confined spaces.

4.4.7 Use flashback safety valves on all lines at the gauges. Torches must have flashback protection built into the torch body or check valves between hose and torch.

4.4.8 Guard against mixtures of combustible gases and air; they can be very explosive.

4.4.9 Never support welding or cutting work on compressed gas cylinders or other containers. Do not weld, cut, or grind on drums, containers, or hollow structures that have contained toxic or flammable substances until they have been thoroughly cleaned or purged and tested with a gas meter.

4.4.10 Do not perform inert gas metal arc welding within 200 ft (61 m) of an area in which any chlorinated solvent is being used. NOTE: Zep Safe/Solv is a chlorinated solvent and will release toxic fumes and gases when exposed to ultraviolet radiation.

4.5 Electric Welding

4.5.1 Use only approved electric welding equipment. Follow the rules and instructions supplied by the manufacturer or affixed to the machine.

4.5.2 Properly ground the electric welding machine before use.

4.5.3 Do not strike an arc with an electrode if persons nearby might be affected by the arc.

4.5.4 When electrode holders are left unattended, remove the electrodes and place or protect the holders so that they cannot make electrical contact with employees or conductive objects.

4.5.5 If you must leave work or stop work for more than 1 hour, or if the welding machine is to be moved, open the power supply switch to the equipment.

4.5.6 Do not stand in water when using an arc-welder. To avoid the risk of electric shock, stand on a dry platform made of wood or another nonconductive material.

4.5.7 Do not dip electrode holders in water to cool them.

4.5.8 Keep your body insulated from the work and the electrode holder during welding operations.

4.5.9 Do not weld in the rain.

4.6 Stainless Steel Welding [Hexavalent Chromium- Cr(VI)]

4.6.1 Determine the 8-hour TWA exposure for each employee on the basis of a sufficient number of personal breathing zone air samples for each job classification, in each work area. Representative sampling instead of sampling all employees can be used in order to meet this requirement. If initial monitoring indicates that employee exposures are below the action level, monitoring may be discontinued.

4.6.2 A combination of air monitoring data, historical monitoring data, or objective data sufficient to accurately characterize employee exposure to Cr(VI) can be used for exposure determination.

4.6.3 Notify employees if above the Permissible Exposure Limits (PEL) with a corrective action plan to reduce employee exposure to or below the PEL.

4.6.4 Use engineering and work practice controls to reduce and maintain employee exposure to Cr(VI).

4.6.5 Provide each employee an appropriate respirator if exposure cannot be eliminated in accordance with the Respiratory Protection Procedure and the Air Monitoring Procedure.

4.6.6 Properly dispose of contaminated protective clothing or equipment.

4.6.7 Provide readily accessible cleaning facilities if required.

4.6.8 Ensure employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics where skin or eye contact with Cr(VI) may occur.

4.7 Grounding

4.7.1 Ground the frame or case of the welding machine in accordance with the methods prescribed in the National Fire Protection Association (NFPA) 70 National Electric Code (NEC), by the manufacturer, and in accordance with the Electrical Safety Procedure.

4.7.2 Ensure that the work or metal upon which the operator welds is grounded to a satisfactory electrical ground. Locate the work on a grounded metal floor or by connections to a grounded building frame or other satisfactory ground. Do not use pipelines carrying gases or flammable liquids and contents carrying electrical conductors for grounding.

4.7.3 Preferably, welding current is returned to the welding machine by a single cable from the work to the welding machine.

4.7.4 Do not use conduit containing electrical conductors to complete a work lead circuit.

4.7.5 Check chains, wire ropes, cranes, hoists, and elevators to determine that they are mechanically strong and electrically adequate for the required current.

4.8 Fire Prevention

4.8.1 When possible, perform hot work in areas designed for such work, i.e., a maintenance shop or a detached outside location of noncombustible or fire-resistant construction, and free of combustibles and flammable material.

4.8.2 When possible, confine welding to areas free of combustible materials. If this is not possible, remove all combustible material or protect it from fire, sparks, and slag. For further information on flammable and combustible liquids, refer to the Fire Prevention and Protection Procedure.

4.8.3 Do not perform welding in the presence of explosive atmospheres.

4.8.3.1 When atmospheric monitoring is conducted:

4.8.3.2 Use gas detection equipment that has been bump tested or calibrated before each day's use;

4.8.3.3 Stop and take additional precautions to control flammable hazards in the area if atmospheric monitoring results are greater than 0% LEL.

4.8.4 When welding inside/near buildings or combustible materials, take the following precautions:

4.8.4.1 Ensure that no flammable liquids are in the vicinity of the work area.

4.8.4.2 Have all combustible materials within area of proposed work moved to a safe distance. If the material cannot be moved because of excessive weight or bulk, protect it with a fire-resistant shield or fire blanket.

4.8.4.3 Ensure that no chlorinated solvents are within the work area.

4.8.4.4 When work cannot be practically moved, make the area fire safe by wetting down the area, laying wet burlap bags over the floor, or stretching canvas or other flameproof noncombustible material over the area where the work is to be performed.

4.8.4.5 Prepare the equipment that last contained flammable or combustible materials by:

- Clear all materials from equipment, including material trapped behind liners or dead ends;
- Isolate the energy sources using one of the following in the preferred order:
  - Air gap with misalignment; or
  - Install blinds; or
  - Double block and bleed approved by Secondary Approver; or
  - Complete a Hazard Analysis or equivalent that must: Describe the alternative isolation method, and assess risks associated with the alternative isolation method, and implement methods to mitigate the risk associated with the isolation method, and be approved by the Project Manager and PSHEM or delegate.
- If residual materials remain in piping/equipment:
  - Use plugs/stopples;
  - Purge the line/equipment: Air concentration must be at 0% LEL where Hot Work will be done; Air concentration must be less than 10% of LEL at the point of exit of the purge gas; and
  - Document in the permit or the Procedure: The purge gas to be used, how the purge will be done, and precautions for a potentially oxygen deficient atmosphere.

4.8.5 Before welding or cutting is started, inspect the area for potential fire hazards and secure the area as follows:

4.8.5.1 Install noncombustible barriers below welding or burning operations in or over a shaft, raise, or grating.

4.8.5.2 When welding or cutting in elevated positions, take precautions to prevent sparks or hot metal from falling onto people or flammable material below.

4.8.5.3 Where combustible materials such as paper clippings, coal, or wood shavings are present, sweep the floor clean to a radius of 35 ft (10.7 m) before welding.

4.8.5.4 Where floors have been wetted down, protect personnel operating arc welding or cutting equipment from possible shock.

4.8.5.5 All welders must have a container for the disposal of used welding rods.

4.8.5.6 Ensure that machinery, tanks, equipment, shafts, or pipes that could contain explosive or highly flammable materials are thoroughly cleaned and decontaminated before applying heat.

4.8.5.7 Shut down or blank off any ducts and conveyor systems that might carry sparks to distant combustibles.

4.8.5.8 At passageways, keep welding leads, extension cords, and burning hoses overhead at least 7 ft (2.1 m) higher than the working surface. Hang them from adequate support with rope or insulated wire. Do not hang from light fixtures, process lines, sprinkler lines, or nails. Hoses and welding leads will not be hung through doorways unless the doors are braced open, and hoses and leads are protected from damage.

4.8.5.9 Ensure that all welding machines and/or portable generators are properly grounded in accordance with manufacturer's directions.

4.8.6 Suitable fire extinguishing equipment, in accordance with the requirements of the Fire Prevention and Protection Procedure, must be immediately available at all locations where welding and cutting equipment is used:

4.8.6.1 A portable spare fire extinguisher(s), appropriate for the type of possible fire (20-lb ABC) must be located at the work area. Maintain the fire extinguisher in a "ready to use" condition at all times. Where hose lines are available and required, they must be connected and ready for service.

4.8.6.2 Each employee using gas or electrical torches, blow torches, or blow pots and other devices using flame must have a fire extinguisher within 25 ft (7.6 m).

4.9 Fire Watch

4.9.1 Fire watches are assigned to the operation when welding, cutting, or heating where such normal fire prevention precautions are not considered adequate, or when any of the following conditions exist:

4.9.1.1 Appreciable combustible materials or contents are closer than 35 ft (10.7 m) to the point of operation.

4.9.1.2 Appreciable combustibles are more than 35 ft (10.7 m) away, but are easily ignited by sparks.

4.9.1.3 Wall or floor openings within a 35 ft (10.7 m) radius expose combustible material in adjacent areas, including concealed spaces in wall or floors.

4.9.1.4 Combustible materials are adjacent to the opposite side of metal partitions walls, ceilings, or roof and are likely to be ignited by conduction or radiation.

4.9.1.5 Provide additional Fire Watch whenever one Fire Watch is unable to observe the entire area. For example, when: The area to be observed is very large or the area includes multiple floors in a structure.

4.9.2 Fire watches must be on duty during the operations and for a sufficient period following the completion of the work to ensure that no possibility of fire exists. A fire check will be made of the area not more than ½ hour after completion of welding.

4.9.3 Fire watches must be provided with necessary fire protection equipment, any necessary PPE, and communication equipment must be readily available and Fire Watch will be trained in its use.

4.9.4 Fire watches must be familiar with Emergency Management Procedure in the event of fire. In addition, fire watchers have the following responsibilities:

4.9.4.1 Watch for fires in all exposed areas and extinguish them if possible with the equipment available or otherwise sound the alarm immediately.

4.9.4.2 Maintain a fire watch for at least ½ hour after completion of cutting or welding operations to detect and extinguish smoldering fires.

4.9.4.3 After completion of a job, check to ensure that the immediate area is free from evidence of fire.

4.10 Ventilation

4.10.1 Welding may produce flammable and toxic by-products, including cadmium, fluorides, mercury, chlorinated hydrocarbons (volatile organic compounds [VOCs]), stainless steel, zinc or galvanized materials, beryllium, lead, or other materials or compounds determined to be toxic or flammable by the manufacturer.

4.10.2 Employees who weld, cut, heat, or braze, or use fluxes, coatings, and filler materials must be protected from exposure to potentially toxic or flammable welding metals and byproducts. Refer to the project hazard communication plan for specific requirements pertaining to the above-listed hazardous materials.

4.10.3 Ventilation must be provided to dilute or remove fumes and vapors from the employee breathing zone, in accordance with the Ventilation Procedure:

4.10.3.1 General Ventilation: When possible, general hot work is performed in open areas with natural air currents to provide general ventilation.

4.10.3.2 Local Ventilation: Welding in enclosed areas with poor air movement is performed with the aid of local exhaust or dilution ventilation. Local ventilation involves the use of fans to exhaust or carry the smoke and vapors away from the breathing zone.

4.10.4 General, mechanical, or local exhaust ventilation is used when welding, cutting, or heating in any enclosed space involves the metals listed below:

4.10.4.1 Zinc-bearing base or filler materials or metals coated with zinc-bearing materials

4.10.4.2 Cadmium-bearing filler materials

4.10.4.3 Chromium bearing metals or metals coated with chromium-bearing filler materials

4.10.5 Ensure that contaminated air exhausted from a working space is discharged into the open air or otherwise clear of the source of intake air.

4.10.6 Proper ventilation is a prerequisite for work in confined spaces to keep the concentrations of toxic fumes, gases, or dusts below the PEL, in accordance with the Industrial Hygiene Monitoring Procedure and the Confined Space Procedure.

4.11 Protective Clothing

4.11.1 Parsons purchases and maintains required PPE in accordance with the Personal Protection Equipment Procedure.

4.11.2 The welder is required to wear an approved helmet or goggles. The thickness of the electrode used and the type of work performed determine the shade number of the welding hood lens. Welders and helpers must wear eye protection in accordance with the Personal Protective Equipment Procedure and as specified in the Filter Lenses for Welding standard (Exhibit 8.2). Secondary eye protection must be worn to guard against flying particles when the helmet or goggles are raised.

4.11.3 Employees and all work areas must be protected from hot welding materials. Welders must wear long sleeves or leathers, and welding gloves when burning or welding. Sleeves must be buttoned, and cuffs and top pockets must be avoided. Other persons on site must be protected from exposure to welding rays, flashes, sparks, molten metal, and slag.

4.11.3.1 Welder's helpers must wear safety glasses with side shields as a minimum protection under the face shield. Shaded glasses are preferred.

4.11.3.2 Where the work permits, the welder is enclosed in an individual booth or is enclosed with noncombustible welding screens.

4.11.3.3 Workers or other persons adjacent to the welding areas must be protected from ultraviolet (UV) light by shields or are required to wear appropriate eye and face protection.

4.11.3.4 Other employees must not observe welding operations unless they use approved eye protection.

4.11.4 If ventilation does not alleviate the potential for overexposure to toxic materials, adequate respiratory protection must be used in accordance with the Respiratory Protection Procedure. An approved cartridge-type air purifying or air line respirator must be used to protect against metal fumes when welding, cutting or grinding the following materials:

4.11.4.1 Zinc metal

4.11.4.2 Metal coated with lead or lead base paint

4.11.4.3 Metal containing mercury or cadmium

4.11.4.4 Hard facing with manganese

4.11.4.5 Beryllium or exotic metals

4.11.4.6 Cutting of stainless steels

4.11.5 Welders may weld, cut, or heat toxic metals in unconfined spaces (open air) if they use filters with air-purifying respirators, or other approved toxic fume and dust filter type air-purifying respirator.

4.11.6 PSHEM determines additional PPE requirements, which may include the following clothing:

4.11.6.1 Aprons for protection against radiated sparks.

4.11.6.2 A cape, shoulder covers, skullcaps, and/or ear protection for overhead welding.

4.11.6.3 Fire-resistant leggings and high boots for heavy work.

4.11.6.4 Fire-retardant clothing, such as Indura Proban, is highly recommended for welders.

4.11.6.5 Dupont Nomex is recommended for pipe fitters and helpers who are exposed to welding slag and grinding sparks.

4.11.7 In accordance with the Fall Protection Procedure, 100% fall protection is required on all platforms, ladders, scaffolds, or runways over 6 ft (1.8 m) above ground level:

4.11.7.1 A full-body harness with shock-absorbing lanyards is required to be worn by all workers and tied off to an attachment point that is capable of supporting 5,000 pounds (2,268 kg).

4.11.7.2 Lifelines must be used if a welder must enter a confined space through a vertical manhole or other small opening. Lifelines must be used in a manner that does not present an entanglement hazard. Lifeline rescue procedures (as specified in the Fall Protection Procedure) must be listed on the hot work permit (Exhibit 8.1).

4.12 Confined Space

4.12.1 AHAs will outline the use of proper PPE, signs, guards, and barricades in these areas.

4.12.2 Welding, burning, cutting, and grinding in a confined space require strict adherence to Confined Space Procedure. Safe work practices include training, air quality monitoring, ventilation, and the hot work permit.

4.12.2.1 The space attendant and the firewatcher cannot be the same person unless fire watching can be done from outside the confined space.

4.12.2.2 Leave gas cylinders and welding machines outside the space and secure them at all times.

4.12.2.3 Avoid accidental contact of the electrode in the holder by removing the electrode when work is suspended and the machine is disconnected from the power source.

4.12.2.4 Thoroughly clean used drums, barrels, tanks, or other containers to be welded to remove flammable materials and substances such as greases, tars, acids, or other materials, which, when subjected to heat, might produce flammable or toxic vapors. Disconnect or blank any pipelines or connections to the drum or vessel.

4.12.2.5 To eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, close the torch valves and shut off the gas supply to the torch at some point outside the confined area if the torch is not to be used for a substantial period. Whenever practicable, remove the torch and hose from the confined space.

4.12.2.6 Welding, cutting, or heating in any enclosed space must be performed with effective local exhaust ventilation or employees must be protected with airline respirators, in accordance with the Respiratory Protection Procedure, if the operation involves any of the metals listed below:

4.12.2.7 Metals containing lead (other than as an impurity or metals coated with lead-bearing materials)

4.12.2.8 Cadmium-bearing or cadmium-coated base metals

4.12.2.9 Metals coated with mercury-bearing metals

4.12.2.10 Beryllium-containing base or filler metals (NOTE: Because of its high toxicity, both local exhaust and airline respirators are required when working with beryllium).

4.12.2.11 In any enclosed space, all surfaces covered with toxic preservative coatings must be stripped a distance of at least 4 inches from the area of heat application, or airline respirators must be used, or both. In open air, filter-type respirators or Powered Air Purifying Respirators (PAPRs) may be used.

4.13 Periodic Inspection

4.13.1 Employees must visually inspect welding equipment before use on each work shift. Remove from service any defective or damaged equipment until it is repaired and tested.

4.13.2 To ensure that there are no recognized hazards in the work area, the PSHEM ensures that the work area is inspected before a hot work permit is issued. The PSHEM checks the work area periodically to ensure the conditions of the hot work permit are maintained.

4.14 Training

4.14.1 Parsons trains affected employees and welders in the hot work procedures to be used on the worksite. Welding and cutting are performed only by experienced and properly trained persons. Subcontractors must train their own employees.

4.14.2 The PSHEM arranges employee training at the time of initial assignment. Supervisors are responsible for identifying additional employee training needs during risk mitigation planning (2-week look-ahead) in accordance with *Parsons ESHARP Guidebook*, Volume 1. Training can be organized and presented to groups or on a work area by work area basis, depending on the operation.

4.14.3 Retraining is required every three years for employees covered under Process Safety Management Procedure.

4.14.4 Retraining is provided for all welders when there is a change in job assignment, equipment, or processes that present a new hazard.

4.14.5 Additional retraining is conducted when there are deviations from or inadequacies with the employee's knowledge or use of proper procedures. The retraining re-establishes employee proficiency and introduces new or revised control methods and procedures, as necessary.

4.14.6 Using an acceptable training form, the records custodian maintains a record of all training or instruction given to employees.

4.15 Documentation

4.15.1 The records custodian documents all instruction, training, and retraining records. Records verifying completion of training are kept in the individual employee's training files.

4.15.2 The superintendent ensures that records of periodic maintenance on equipment are maintained.

4.15.3 The PSHEM maintains project records at the site for the duration of the project and archives them at project closeout.

5. Definitions

Term	Definition

Term	Definition
Affected Area	The space surrounding the Hot Work activity where sparks, heat, etc. can travel and become a potential source of ignition. For High Energy Hot Work this area is generally larger than for Low Energy Hot Work. The area can also be reduced by mechanical guarding. When not certain use a distance of 35 ft (10.7 m) from the Restricted or Flammable Area. When working in a structure at height also consider falling hot sparks and parts.
Affected Employees	Workers, welders, fire watch, permit issuers, personnel involved or affected by Hot Work
CFR	Code of Federal Regulations
Corporate Safety	Includes, but is not limited to: Senior Vice President - Safety, Health, Environment & Sustainability; Vice President - Safety, Health & Environment (SH&E); and SH&E Director
EM	Engineering Manuals
Hazardous Areas	Areas in which flammable or combustible materials, liquids, gases, vapors, or dusts are present or could be present.
High Energy Hot Work	Activities that generate open flames and/or sparks and activities that could provide an ignition source for combustibles and flammables.
Hot Work	Electrical arc, gas welding, brazing, cutting, or other such open flame activities.
Hot Work Exempt	An area that is not located in a Restricted or Flammable Area, and also contains no potential sources of flammable materials and is free of combustible materials (e.g. office areas free of combustibles and flammables, roadways and parking lots).
Hot Work Flammable Area	Equivalent to NFPA – Class I, Division 2 and Class II, Division 2 locations. Flammable liquids or gases exist and are normally confined, but: 1) Might escape in case of accidental rupture or breakdown of containers or systems, or abnormal operation of equipment, or 2) Ignitable concentrations of gases or vapors, that are normally prevented by ventilation equipment, might become hazardous through failure or abnormal operation of such equipment, or 3) The area is adjacent to a Restricted Area. Combustible dust: 1) Is not normally in the air in quantities sufficient to produce explosive or ignitable mixtures, or 2) May be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, where dust accumulations on, in or in the vicinity of, electrical equipment may be sufficient to interfere with, or ignitable by abnormal operation or failure of electrical equipment.
Hot Work General	An area that is not a Restricted or Flammable Area, but where combustible materials may be in the Affected Area. This includes new construction areas that are free of flammables and not operating yet.

Term	Definition
Hot Work Restricted Area	Equivalent to Class I, Division 1 locations and Class II, Division 1 locations. Ignitable concentrations of flammable gases or vapors: 1) Exist under normal operating conditions, or 2) May exist frequently because of repair, due to maintenance operations or leakage, or 3) Might be released due to breakdown or faulty operation of equipment or processes. Combustible dust is in the air: 1) Under normal operating conditions in quantities sufficient to produce explosive or ignitable mixtures, or 2) Where mechanical failure or abnormal operation of machinery or equipment might cause explosive or ignitable mixtures to be produced, or 3) In which combustible dusts on an electrically conductive nature may be present in hazardous quantities.
Low Energy Hot Work	Activities that generate heat or have the potential to generate sparks, and activities that generally do not provide an ignition source - operation/access of vehicles, electrical tools, hand tools, and fuel powered tools.
NFPA	National Fire Protection Association
NEC	National Electric Code
Permissible Exposure Limit (PEL)	The time-weighted average threshold limit a person working an 8-hour shift can be exposed to a chemical without suffering ill effects.

6. Responsibilities

Corporate Safety: Responsible for developing and maintaining this procedure and conducting periodic reviews and updates to ensure alignment and integration with related or referenced policies and procedures; coordinating reviews by individuals and organizations responsible for and supported by implementation, including resolution of comments received; developing training materials, forms, and templates necessary to implement the procedure; and providing safety subject matter expertise and guidance to help ensure the success of this procedure. Responsible for providing support to ensure the success of this procedure and auditing its effectiveness.

Project Manager (PM): Ultimately responsible for delivering the project and assigning roles and responsibilities to discipline managers and the Project Management Team; implementing and enforcing this element; establishing areas and procedures for welding and cutting; designating individuals responsible for authorizing welding and cutting operations; and identifying and scheduling work in hazardous areas.

Records Custodian: Responsible for documenting employee training and serving as records custodian, maintaining and archiving related documentation.

Superintendent: Responsible for facilitating compliance with and enforcement of this procedure; scheduling hot work in hazardous areas; and ensuring that a record of all equipment on site is maintained and periodic maintenance is performed.

Project Safety Health and Environmental Manager (PSHEM): Responsible for developing, monitoring and assisting in the implementation of this procedure on the jobsite; conducting orientations for subcontractors and new employees; determining training needs and coordinating training for affected employees; providing the regulatory expertise to ensure that activities are conducted in compliance with the applicable codes, standards, and regulations; ensuring that AHAs are performed; reviewing and approve hot work permits; conducting inspections to ensure that the conditions of the hot work permit are maintained; and determining PPE requirements in addition to minimum requirements.

Foreman/Supervisor: Responsible for supervising hot work and enforcing this procedure; conducting daily safety huddles emphasizing safety during hot work; scheduling hot work in hazardous areas; and completing and submitting hot work permits.

Welder: Responsible for performing electrical work safely, in accordance with instructions and training received, and in compliance with hot work plan requirements.

Fire Watch: Responsible for conducting fire checks; and extinguishing fires or sounding alarm.

Employees: Responsible for complying with the requirements of this procedure.

Subcontractors: Responsible for complying with all Parsons' requirements; and training their own employees in applicable Parsons' procedures.

7. Exceptions

The PM may request or require a more stringent process if required by the contract or is beneficial to the project.

8. Exhibits

8.1 Hot Work Permit

8.2 Filter Lenses for Welding

9. Revision History

Revision	Changes	Approver	Approval Date
2	Added 4.1, 4.9.1.5 and Definitions (Affected Area, Affected Employee, High Energy Hot Work, Low Energy Hot Work, Hot Work Exempt, Hot Work Flammable Area, Hot Work General and Hot Work Restricted Area).	Beck, Gregory	4/9/2019
1	Added 4.1.1.1-4.1.1.9; 4.2.2.1-4.2.2.3; 4.7.3.1; 4.7.4.5-4.7.4.7; Corporate Safety to Definitions and Responsibilities.	Beck, Gregory	2/28/2019
0	Original Issue	Barber, Bradley	8/27/2015

Exhibit 8.1 - Hot Work Permit

Page 1 of 2

This permit becomes void: PERMIT NO. ______________________

☐ At the end of the shift, OR
☐ Whenever conditions change significantly, OR
☐ On any emergency signal.

Date: ____________________ Shift: ____________________
Building: ____________________ Area: ____________________
Nature of Work: ____
____
Special Precautions: ____
____
Is fire watch required? ____
Is additional permit required? (i.e., confined space) ____________________

STEP 1

Before approving any cutting and welding permit, the supervisor must inspect the work area and confirm that precautions have been taken to prevent fire in accordance with this procedure and permit.

PRECAUTIONS

☐ Sprinklers in service
☐ Cutting and welding equipment in good repair
☐ PPE available and in good condition

WITHIN 35 FT OF WORK

☐ Floors swept clean of combustibles
☐ Combustible floors wet down, covered with damp sand, metal or other shields
☐ No combustible material or flammable liquids
☐ Combustibles and flammable liquids protected with covers, guards or metal shields
☐ All wall and floor openings covered
☐ Covers suspended beneath work to collect sparks

WORK ON WALLS OR CEILINGS

☐ Construction is noncombustible and without combustible covering
☐ Combustibles moved away from opposite side of wall

WORK ON ENCLOSED EQUIPMENT
(Tanks, containers, ducts, dust collectors, etc.)

☐ Equipment cleaned of all combustibles
☐ Containers purged of flammable vapors

FIRE WATCH

☐ To be provided during and 30 minutes after operation
☐ Supplied with extinguisher and small hose
☐ Trained in use of equipment and in sounding fire alarm
☐ Has necessary personnel protective equipment

FINAL CHECKUP

☐ To be made 30 minutes after completion of any operation unless fire watch is provided.

Print Name: ______________________ Signed: ______________________
Supervisor

Exhibit 8.1 - Hot Work Permit

Page 2 of 2

STEP 2

The location where this work is to be done has been examined, necessary precautions taken, and permission is granted for this work. (See other side)

Permit expires: ______________________

Print Name: ______________________ Signed: ______________________
PSHEM

Time started: ______________________ Completed: ______________________

STEP 3

Final Checkup

Work area and all adjacent areas to which sparks and heat might have spread (including floors above and below and on opposite sides of walls) were inspected 30 minutes after the work was completed and were found fire safe.

Print Name: ______________________ Signed: ______________________
Supervisor or Fire Watch

Exhibit 8.2 - Filter Lenses for Welding

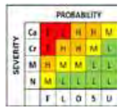
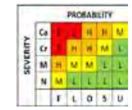
Welding Process	Arc Current (Amperes)	Minimum Protective Shade	Suggested Protective Shade (Comfort)
Shielded Metal Arc Welding (SMAW)	Less than 60	7	—
	60 to 160	8	10
	160 to 250	10	12
	250 to 550	11	14
Gas Metal Arc Welding (GMAW) (MIG)	Less than 60	7	—
	60 to 160	10	11
	160 to 250	10	12
	250 to 550	10	14
Gas Tungsten Arc Welding (GTAW) (TIG)	Less than 50	8	10
	50 to 150	8	12
	150 to 500	10	14
Air Carbon (light)	Less than 500	10	12
Air Carbon (heavy)	500 to 1,000	11	14
Plasma Arc Welding (PAW)	20 to 100	8	10
	100 to 400	10	12
	400 to 800	11	14
Plasma Arc Cutting (PAC)	Less than 300	8	9
	300 to 400	9	12
	400 to 800	10	14
Carbon Arc Welding (CAW)	—	—	14
MIG = metal inert gas TIG = tungsten inert gas			

APPENDIX D

RISK REGISTER

PARSONS

Appendix D
NYSDEC Stand-By Contract No. D009811
Risk Register

Activity	HOC Confirmation	Hazard Identification	At Risk	Pre-Risk Mgt Evaluation Matrix			Pre-Risk Mgt Treatment	Risk Management & Control -- Safety & Health		Risk Management & Control -- Environmental			Responsible Person	Cost Contingency	Post-Risk Mgt Evaluation Matrix			Residual Risk Action
				Probability	Severity	RAC (Pre-Risk)		Engineering/ Administrative Controls	PPE	Waste Management	Engineering/ Administrative Controls	Site Condition Controls			Probability	Severity	RAC (Post-Risk)	
General Field Activities	Yes	Uneven terrain, Biological, Weather, Dehydration, Struck by/against, Noise, contact with hazardous substances, traffic, ergonomic, S/T/F, pinch points, hand tools	Site personnel	Likely	Critical	MODERATE	Reduce	Review AHAs. Wear sun screen, PPE, Procedures, walk the job path, stay hydrated	Level D - Modified, cut resistant gloves	NA	Procedures, Training/education, Checklists/audits, Instructions	NA	Field Team Leader	Covered in Budget	Seldom	Critical	LOW	NA
Working in Urban Areas	Yes	Security issues, contact with public, theft vandalism or civil disturbance	Site personnel	Likely	Critical	MODERATE	Reduce	Review AHAs, use a buddy system, avoid working at night, have a fully functional cell phone	Level D	NA	Procedures, Training/education, Checklists/audits, Instructions	NA	Field Team Leader	Covered in Budget	Seldom	Critical	LOW	NA
Hand Tool Usage	Yes	S/T/F	Site personnel	Seldom	Catastrophic	HIGH	Eliminate	Review AHAs, procedures, Lock Out/Tag Out	Level D - Modified; insulated gloves	NA	Lock Out, Tag Out; training/education, Checklists, instructions, procedures	NA	Field Team Leader	Covered in Budget	Seldom	Critical	MODERATE	NA
Heat Stress / Cold Stress	Yes	Heat / Cold Stress	Site personnel	Likely	Catastrophic	HIGH	Eliminate	Review AHAs, procedures, Weather	Level D	NA	Training/education, Checklists, instructions, procedures, Proper PPE and Break areas	NA	Field Team Leader	Covered in Budget	Seldom	Critical	MODERATE	NA
Field Oversight of Drilling	Yes	Weather, traffic, heavy equipment, S/T/F, biological, pollen, struck by/against	Site personnel	Likely	Catastrophic	HIGH	Eliminate	Review AHAs, PPE, be awae of surroundings, procedures, Weather	Level D - Modified	NA	Training/education, Checklists, instructions, procedures	NA	Field Team Leader	Covered in Budget	Seldom	Critical	MODERATE	NA
Field Sampling	Yes	S/T/F, housekeeping, pinch hazards, weather, noise, chemical, traffic, ergonomic, electrical, physical hazards, struck-by	Site personnel	Likely	Catastrophic	HIGH	Eliminate	Review AHAs, NYC DDC Site procedures, training, proper tool for the job, inspections	Level D - Modified Level D as needed-	NA	Training/education, Checklists, instructions, procedures. Air Monitoring.	NA	Field Team Leader	Covered in Budget	Seldom	Critical	MODERATE	NA
Vehicle Operations	Yes	Accidents, struck-by, vehicle damage	Site personnel	Likely	Catastrophic	HIGH	Eliminate	Maintain and inspect vehicle, Drive Defensively: follow speed limits and signs, take rest breaks	None	NA	Training/education, Checklists, instructions, procedures	NA	All	Covered in Budget	Seldom	Critical	MODERATE	NA

APPENDIX E

SITE TRAINING MATRIX

Appendix E –Site Training Matrix
NYSDEC Stand-By Contract No. D009811

Employee Name / Employee Title / Employee Function	Required Compliance / Risk Control / Risk Management Training	Required Licenses / Designations of Authority / Competencies / Qualifications / Certifications	Frequency of Required Refresher Training / Assessment of Continuing Competency
Parsons field staff and Contractors performing Project Work	Parsons PSHEP and SSHEP review and sign-off	Sign PSHEP and SSHEP OSHA training certification or wallet card	Prior to working on site
Parsons personnel performing field work on sites with Environmental issues	40-Hr Hazwoper Training and/or 8-Hr Annual Refresher **– if contamination and potential for exposure during scope of work**	Obtain Hazwoper training certificate	Minimum training for working on site
Parsons personnel performing field work	Daily Tailgate to cover SOW and daily hazards	Sign tailgate form	Each field day prior to beginning work on site
Parsons personnel performing field work	Site Orientation	Sign tailgate form	First day of field event or if new personnel are onsite
One field staff per property	First Aid / CPR / AED	Designated provider of first aid / CPR	Every 2 years (with bloodborne pathogens training)
Project field personnel including visitors	Minimum PPE: Hardhats, gloves, eye protection, safety boots, safety vests and hearing protection (where required) Additional PPE as required by task specific AHAs	PSHEP and SSHEP review	On initial assignment; upon changes to PPE use; upon changes to tools or equipment
Parsons and subcontractor field staff performing field work	Emergency Action Plan	Can be included in PSHEP review or provided verbally during tailgate safety meeting. Have DASH Card available	On initial assignment; upon material changes to emergency action plan changes
Parsons field staff including project manager, construction manager, site construction representatives, samplers, property representative, and subcontractor field staff	Hazard Communication	PSHEP review and location of SDS	On initial assignment; when new chemicals are added to the work environment
All visitors and contractors	Check in with site contact	PSHEP/Project and Facility Orientation	According to NYC DDC requirements
Contractors	Task / Equipment specific training	Signed Competent Person Form or equivalent	Prior to working on site, refresher as per regulatory requirements or a needed to validate competency

Note: Training referenced above is limited to worker health and safety. It does not cover other subcontractor non-health and safety-related training requirements.

APPENDIX F

PROJECT SAFETY, HEALTH, AND ENVIRONMENTAL PLAN (PSHEP) MODEL HEALTH AND SAFETY FORMS

TAILGATE BRIEFING FORM

The Tailgate Briefing is intended to be used in conjunction with Project Safety Health and Environmental Plan (PSHEP) worker-developed Activity or Job Hazard Analysis (AHA/JSA) applicable Work Permits and the results of pre-planning meetings and communications.

1. Have field personnel and adjacent property owners that could be affected been made aware of the hazards, special procedures, and/or permit requirements?

Yes	No

2. Are all personnel aware of the requirement to inspect all equipment & tools before the first use of the day, establish work place controls/barricades and only allow trained and authorized staff in the work zone?

Yes	No

3. Has there been any change in work area conditions that requires additional discussion?

Yes	No

4. Are all personnel aware of their obligation to STOP work in view of changing conditions or activities not included in the PSHEP or AHA?

Yes	No

5. Are all personnel "Fit for Duty" and physically and mentally prepared to complete their assigned tasks in a safe manner. Employees should be asked but are not required to share any known pre-existing medical conditions so that others may assist as appropriate.

Yes	No

Date & Time of Meeting: ____________________
Person Leading Discussion (Name & Company): ____________________________________
<u>Relevant Topics Discussed (Observations/Suggestions/Weather Concerns):</u>

____

Acceptance of AHA/PSHEP/HASP Review, Onsite Fit For Duty (FFD)						
Name	**Signature**	**Company**	**Initial**	**Onsite Time**	**Initial**	**Offsite Time**

Exhibit 5-1 – Preconstruction SH&E Meeting, Site-Specific Review, and Project Technical General Conditions Specification Review Form

PARSONS

Preconstruction SH&E Meeting
Site-Specific SH&E Review Checklist
Project Technical and General Conditions Specification Review (Sheet 1 of 3)

Date:	
Subcontractor Representative:	
Phone:	
Project Location:	
Parsons Project Manager:	
Phone:	
Subcontractor Safety & Health Representative:	
Phone:	
Parsons Safety & Health Manager:	
Phone:	

This checklist supports the identification of work activities and programs in a preconstruction SH&E meeting. This list also includes items identified through the subcontractor review and high-risk activities identified through the project specification review.
High-risk activities (denoted with an asterisk) checked with a checkmark must be followed up during the construction phase with training, written plans and/or a specific Activity Hazard Analysis (AHA).
This list should be reviewed with prospective bidders during the pre-bid meeting.
NOTE: Use check box and add specifics and details as applicable (next to the callouts)

	SAFETY & HEALTH
☐	Site-Specific Safety, Health and Environmental Plans
☐	Competent/Qualified Person Documentation
☐	SH&E Audits/Inspections
☐	Subcontractor Responsibilities
☐	Site Orientation Requirements
☐	Preconstruction SH&E Meeting/Date
☐	Crane Inspection Certification
☐	Personal Protective Equipment (PPE) (Work activities or work site requires hearing protection/using respirators/special protective clothing/other)
☐	Public Exposure (Work activities or location requires special precautions to protect the public)
	CONSTRUCTION SAFETY ISSUES
☐	Excavations/Trenching
☐	Powered Industrial Trucks, Fork Lifts
☐	Crane Work/Heavy Lifts, Rigging
☐	Work involving Hazardous Materials

Exhibit 5-1 – Subcontractor Premobilization SH&E Meeting, Site-Specific Review, and Project Technical General Conditions Specification Review Form (Contd)

PARSONS

Preconstruction SH&E Meeting
Site-Specific SH&E Review Checklist
Project Technical and General Conditions Specification Review (Sheet 2 of 3)

	CONSTRUCTION SAFETY ISSUES (Contd.)
☐	Electrical Tie-ins/Lockout – Tagout
☐	Aerial Lift Work – Scissor Lifts, Extendable Boom, etc.
☐	Underground, Caissons, Cofferdams
☐	Scaffold Erection/Work
☐	Demolition
☐	Marine Work/Live Boating
☐	Heavy Hauling
☐	Concrete
☐	Diving
☐	Work Adjacent to Production Areas
☐	Site Security/Visitor Control/Public Areas
☐	Process Safety Management (PSM)
☐	Permits (Excavations, Scaffolding, Demolition, Traffic, Confined Space, Hot Work, Line Breaking, etc.)
☐	Confined Space (Confined space entry is required)
☐	Welding and cutting (Acetylene/gas cutting, arc welding, soldering and brazing)
☐	Ladders (Portable ladder use is required)
☐	Traffic Control (Work is on or near highways, roads, or mass transit)
	MEDICAL
☐	Substance Abuse Screening
☐	Emergency Procedures
☐	Site Security
☐	Smoking Policy
☐	Medical Services Requirements
☐	Treatment Locations, Addresses, and/or Phone List
	ENVIRONMENTAL
☐	Environmental Hazards
☐	Air Pollution/Emissions and required reporting
☐	Wastewater Discharges
☐	Drinking Water
☐	Management of Hazardous Materials and Hazardous and Solid Wastes
☐	Emergency Response to Spills and Releases Environmental Assessments
☐	Protected Ecological and Cultural Resources
☐	Specific Reports on Toxic or Hazardous Chemicals Usage and Storage (Required by Environmental Regulation)

Exhibit 5-1 – Premobilization SH&E Meeting, Site-Specific Review, and Project Technical General Conditions Specification Review Form (Contd)

Preconstruction SH&E Meeting Form
Site-Specific SH&E Review Checklist
Project Technical and General Conditions Specification Review (Sheet 3 of 3)

	ENVIRONMENTAL (Contd)
☐	Materials to be Recycled
☐	Possibility of Buried Items Onsite (cultural artifacts, tanks, wastes, and ordinance) and what to do if encountered
☐	Environmental Regulatory Requirements
☐	Environmental Assets
☐	Resource Conservation/Sustainability

Additional Notes/Comments:

ATTENDEES

Name	Title	Company

PARSONS

Competent Person Form

Definition

A competent person is a person having the ability to recognize existing and predictable hazards and having the authority to correct them.

Responsibility

The designated competent person is responsible for recognizing and correcting SH&E risks/hazards. This person has the authority to stop work in a potential SH&E concern on the jobsite. This form must be completed by each designated competent person. *Where an employee is responsible for multiple crafts, it will be necessary to maintain additional designated competent persons and forms.* Each competent person on a Parsons project must submit this completed form to the Parsons Project Manager before beginning work on the project and must update it any time the designated representative(s) changes.

Acknowledgment

I, ___________________________________

Employee Name

have been assigned _____to be the competent person in the areas indicated and
I _____ acknowledge that I have been thoroughly trained and an experienced in hazard recognition and have the authority to stop work and correct hazards in the event of a potential hazardous or imminent danger situation.
Check appropriate listed below items.

☐	Air Pollution and Emissions	☐	Environmental Assessments	☐	Mechanical Demolition
☐	Asbestos	☐	Excavations and Trenches	☐	Protected Ecological and Cultural Resources
☐	Bolting, Riveting, and Fitting	☐	Fall Protection	☐	Resource Conservation
☐	Buried Items	☐	First Aid and CPR	☐	Respiratory Protection
☐	Concrete, Forms, and Shoring	☐	Hearing Protection	☐	Rigging
☐	Cranes and Derricks	☐	Ladders	☐	Scaffolding
☐	Demolition	☐	Lead	☐	Tunnels and Shafts
☐	Drinking Water	☐	Management of Hazardous Materials and Hazardous Solid Wastes	☐	Underground Construction
☐	Electrical			☐	Wastewater
☐	Emergency Response to Spills and Releases	☐	Marine Work and Diving	☐	Welding and Cutting
		☐	Material and Personnel Hoists		
☐	Other				

Exhibit 5-4 – Subcontractor Premobilization SH&E Meeting Form

PARSONS

Subcontractor Premobilization SH&E Meeting Form

Date:			**Project/Location:**		
Parsons Representative:			**Subcontractor Representative:**		
The following project site safety, health, security, and environmental requirements, procedures, and hazards have been identified and reviewed with the subcontractor:					
Mark with "X"	**Item**	**Mark with "X"**	**Item**	**Mark with "X"**	**Item**
☐	Air Pollution and Emissions	☐	Fall Protection, Guardrails, and/or Scaffolding	☐	Personal Protective Equipment
☐	Asbestos			☐	Process Safety Management (PSM)
☐	Buried Items	☐	Fire Protection		
☐	Competent / Qualified Person	☐	Hazardous Materials and Wastes	☐	Protected Ecological and Cultural Resources
☐	Confined Spaces (Permit / Non-Permit)	☐	Hot Work, Welding, and/or Cutting	☐	Resource Conservation and Sustainability
☐	Cranes / Hoists / Annual Inspection Certificate(s)	☐	Ladders	☐	Site Security, Visitor Control, and Public Exposure
☐	Demolition	☐	Lead Paint	☐	Specific Reports (Required by Environmental Regulation) on Toxic or Hazardous Chemicals Usage and Storage
☐	Drinking Water	☐	Lockout / Tagout		
☐	Electrical	☐	Management of Hazardous Materials and Hazardous Solid Wastes		
☐	Emergency Response to Spills and Releases			☐	SSHEP, Emergency Planning and Response Plan
☐	Environmental Assessments	☐	Overhead Power Lines	☐	Wastewater Discharges
☐	Excavations and Trenches	☐	Permits (Excavations, Scaffolding, Demolition, Traffic, Confined Spaces, etc.)	☐	Vehicle and Heavy Equipment
				☐	Other:
Protection of the Public:					
Additional Project Concerns:					
Attendees:					

Name	**Title**	**Company**

ParShare link: [Subcontractor Premobilization SH&E Form]

Exhibit 6-2 – Activity Hazards Analysis Template

Activity Hazard Analysis (AHA) Template

Activity/Work Task:	Overall Risk Assessment Code (RAC) (Use highest code)					
Project Location:	**Risk Assessment Code (RAC) Matrix**					
Contract Number:	**Severity**	**Probability**				
Date Prepared (MM/DD/YY):		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name/Title):	Catastrophic	**E**	**E**	**H**	**H**	**M**
	Critical	**E**	**H**	**H**	**M**	**L**
Reviewed by (Name/Title):	Marginal		**M**	**M**	**L**	**L**
Employer / GBU: Parsons	Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.) **References:**	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	Hazards	Controls	P	S	RAC

Note: This page will continue for more pages, the header will continue with subsequent entries. ParShare link: AHA Template

Exhibit 6-2 – Activity Hazards Analysis Template (Contd)

Activity Hazard Analysis (AHA) Example (Contd)

Activity/Work Task:		**Overall Risk Assessment Code (RAC) (Use highest code)**			
Project Location:		**Risk Assessment Code (RAC) Matrix**			
Job Steps (Contd)	**Hazards**	**Controls**	**P**	**S**	**RAC**

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements

Note: This page will continue for more pages, the header will continue with subsequent entries. ParShare link: AHA Template

Exhibit 6-3 – SH&E Activity Hazards Analysis Training Record

PARSONS

SH&E Activity Hazards Analysis Training Record

Job Number:		
AHA Number:		
Job Location		
Date:		
Name of Trainer:		
Subjects Covered:		
Training Aids Used:		

Attendees – Please Sign Name Legibly Below		
Use additional sheets if necessary.		

ParShare link: SH&E Hazards Analysis Training Record

EXHIBIT 6-4 – EXAMPLE PROJECT AUDIT AND INSPECTION SCHEDULE

Inspection [a]	Name and Title of Assigned Employee(s)	Minimum Frequency
Comprehensive Audit		Annual
Compliance		Monthly
Focused		Weekly
Sanitary Facilities, Drinking Water, Food Service Areas, And Temporary Quarters		Daily
Respiratory Protection		Monthly
Fire Extinguishers		Monthly
Hazardous Material Storage		Weekly
Ladders		Monthly
Scaffolds		Each Shift
		Monthly
Aerial Lifts		Each Shift
Fall Protection		Weekly
		Quarterly
Lockout/Tagout (LOTO)		Monthly
Motor Vehicles and Equipment		Each Shift
Rigging		Before Use
		Monthly
Cranes and Hoisting Equipment		Daily
		Monthly
		Annual
Excavations		Daily

Exhibit 6-5 – Weekly SH&E Inspection Checklist
2 Sheets (Sheet 1 of 2)

PARSONS

Weekly SHE Inspection Checklist (Sheet 1 of 2)

	Week Ending Date:
Project Name	**Project Number:**
Nam of Audito :	**Signature:**

Check each box during your inspection or indicate N/A. Substandard conditions found must be identified on the back of this checklist.

	El ctrical: temporary pow r, circuits marked, GFC protection, damaged co ds, cords rotected, correct outlets, and signage.
	Environmental: Air emissions controlled, hazard com program, specific MSDS sheets, fuel signage, spillage dike, dust control, HAZMAT storage, and waste disposal.
	Excavations: Guarded, Soil Condition, Trenching Controls, Blue Stake/Equivalent, Daily Inspections Subcontractor, and Proper Access.
	Fire Safety: Extinguishers; Proper Size, Numbers, Proper Locations, Hose Stations, Hot Work Permit, Fuel Storage.
	Framing Activities: Proper Positions, Monitor, Fall Protection, Housekeeping, Forklift Activity, Training, and Tool Use.
	Guarding: Floors, Walls, Windows, Leading Edge, Roof, Elevator Shafts, Open Holes, Material, Quality, and Handrail
	Housekeeping: Office, Walkways, Waste Material, Lay Down Yard, Grounds, and Subcontractor Areas, Food Debris.
	Ladders: Height, Secured Top/ Bottom, Condition, Employee Position; Three Points of Contact.
	Material Handling: Rigging, Material Condition, Training, Tasks, Proper Lifting, Wheel Barrows, Stacking/Storage.
	Medical: First Aid Kits, Numbers Posted, Address Knowledge, Nearest Emergency Assistance, CPR/First Aid Training.
	Mobile Equipment: Inspections, Condition, Backup Alarms, Leaks, Fuel Storage, Proper Parking, and Training.
	PPE: Hearing, Head, Hand, Eye, Foot, Fall, Seatbelts, Respiratory,
	Sanitary: Drinking Water, Toilets Clean and Adequate, Soap and Water for Washing
	Scaffolds: Component Damage, Footing, Secured, Guardrail, Training, Inspections, Pins & Bracing, Planking, and Ladders.
	Tools: Damage, Cords, Blades, Guards, Hoses, Handles, Switches, Training, Proper Use, Storage, Adequate.
	Training: Forklift, Man Lift, Water Truck, Orientation, Task, Hazards, Power Tools, Scaffolds, and Trenching.
	Welding: Hot Work Permit, PPE, Gas Checks, Confined Space, Tank Storage, Equipment Inspections, and Fire Protection
	Miscellaneous: Any condition or behavior not identified on this checklist.

ParShare link: [Weekly SH&E Inspection Checklist]

Exhibit 6-5 – Weekly SHE Inspection Checklist (Sheet 2 of 2) (Contd)

Weekly SHE Inspection Checklist (Sheet 2 of 2)

	Week Ending Date:
Project Name	**Project Number:**
Name of Auditor:	**Signature:**

Hazard Type	1.	Improper or Inadequate Guarding	8.	Substandard Housekeeping
	2.	Improper Wiring	9.	Hazardous Environmental Cond tions
	3.	Defective Tools, Equipment, Substances	10.	Radiation Exposures
	4.	Hazardous Arrangements	11.	Congestion or Restricted Movement
	5.	Inadequate Illumination	12.	Inadequate Warning System
	6.	Inadequate Ventilation	13.	Fire & Explosive Hazard
	7.	Improper Personal Protective Equipment	14.	Other:
Basic Causes	1.	Inadequate Engineering	7.	Inadequate Leadership & Supervision
	2.	Normal Wear & Tear	8.	Physical Incapacity
	3.	Inadequate Purchasing	9.	Lack of Knowledge
	4.	Inadequate Maintenance	10.	Improper Motivation
	5.	Inadequate Work Standards	11.	Mental Incapacity
	6.	Abuse	12.	Other:
Hazard Classification	**Class A: Likelihood of Death** **Class B: Likelihood of Serious Injury** **Class C: Likelihood of Minor Injury**			

Items	**Hazard Type**	**Basic Cause**	**Hazard Class**	**Location**	**Remedial Action(s)**

Comments:

Exhibit 6-6 – Notice of Subcontractor Violation of Safety, Health, and Environmental Regulations

PARSONS

Notice of Subcontractor Violation of Safety, Health, and Environmental Regulations

		Date:
Contractor Name:		
Address:		
Attention:		

This letter officially notifies you that you have been found to be in violation of the following Safety, Health, and Environmental Regulations: ____________________

on (date) ____________________, by ____________________

Confined Space Entry	☐	Lockout/Tagout	☐	Hot Work	☐	Personal protective equipment
Knowledge of environmental requirements	☐	Awareness of warning alarms	☐	Evacuation routes	☐	Backup alarms
Assembly locations	☐	Fall Protection	☐	Scaffolding	☐	Environmental/hazardous material storage
Trenching	☐	Safe Work Practices	☐	Security Practices	☐	Spill to the environment
Waste storage or disposal	☐	Wastewater discharge	☐	Buried items	☐	Violation of environmental regulation

Other: ____________________
Environmental:
This/These violations occurred at the following locations: ____________________
At the following times and dates:
The name of the employee(s) was (were):

Exhibit 6-7 – Notice of Subcontractor Nonconformance with Safety, Health, and Environmental Regulations

Notice of Noncompliance with Safety, Health and Environmental Regulations

Under conditions of this enforcement procedure check all items that apply:

☐	1.	You are being notified of this violation and should take corrective action to prevent a reoccurrence. The corrective action shall be documented to the Parsons Construction Management representative immediately.
☐	2.	You must submit a plan for compliance to your Parsons Construction Management representative and the Construction Safety Manager within two days of receipt of this letter. The compliance plan must include the means or methods of compliance and the date that the requirements for compliance will be completed. Once compliance has been achieved, a follow up letter must be sent to the Parsons Construction Management representative and Construction Safety Manager. Failure to comply will result in disciplinary action against your Company.
☐	3.	You are required to review the stated procedures with your Parsons Construction Management representative. Work may not commence on the site until the review is complete and the Subcontractor responds formally that the procedure is understood and will comply.
☐	4.	You are required to review the stated procedures with your Parsons Construction Management representative. Work may not commence on the site until the review is complete and you **must** confirm formally the disciplinary action to be taken against the supervisor and employees.
☐	5.	All work on the site will stop until the Parsons Construction Management representative reviews all the facts with the Subcontractor and determines if the contract between the parties will be terminated.

Sincerely,

Parsons Representative

cc:
Issuing Construction Manager Representative
Job File
GBU Safety Director
Project Manager

Exhibit 7-1 – Initial Subcontractor Employee Training Acknowledgement

PARSONS

Initial Subcontractor Employee Training Acknowledgment

Name of Trainer: ______________________________

Training Subject: ______________________________

Training materials used: ______________________________

Name of employee: ______________________________

Date of hire/assignment: ______________________________

I, xxx (name), hereby certify that I have received training as described above in the following areas:

- The potential occupational hazards in general in the work area and associated with my job assignment.
- General SH&E requirements indicate the safe work conditions, safe work practices, personal protective equipment, and environmental requirements required for my work.
- The hazards of any chemicals to which I may be exposed and my right to information contained on material safety data sheets for those chemicals, and how to understand this information.
- My right to ask questions, or provide any information to the employer on safety, health, or environment either directly or anonymously without any fear of reprisal.
- Disciplinary procedures the employer will use to enforce compliance with general safety requirements.
- I understand this training and agree to comply with general safety requirements for my work area.

______________________________ ______________________________

Employee Signature Date

Exhibit 7-3 – Take 5 Card

PARSONS	Safety – The first thing you do!

Date: ______________________________

Project/Task: ______________________________

Your Name: ______________________________

Before you begin any new task pause for 30 seconds and ask yourself the following questions. Take corrective actions as necessary prior to beginning work.

- ☐ Do I know exactly what I am doing?
- ☐ Have I reviewed the AHA for this task?
- ☐ Do I have all the right people involved?
- ☐ Is there any potential that I or my coworkers could get hurt?
- ☐ Are there any questions I should be asking fellow employees?
- ☐ Should I talk to my supervisor?
- ☐ Have I read the Work Plan and fully understand the procedures relating to this job?
- ☐ Am I using the proper tools?
- ☐ Do I have the proper PPE?
- ☐ Will I be working as safely as I know how?
- ☐ Do I see anything that just doesn't look quite right?
- ☐ Am I in a hurry? Would I be safer if I slowed down?

Each of these questions should be answered to your full satisfaction before you proceed with the work. Remember, no job is so important that you must jeopardize your safety.

Job Hazards? (List direct hazard of job duties)

1. Hazards: ______________________________
   Mitigation: ______________________________
2. Hazards: ______________________________
   Mitigation: ______________________________
3. Hazards: ______________________________
   Mitigation: ______________________________

Work Area	**Yes**	**No**
Work Area Clean	☐	☐
Permits Attained	☐	☐
Standard PPE (Hard hat, vest, glasses, gloves, safety boots)	☐	☐
Additional PPE needed:		

Briefly review hazards and mitigations again after lunch.

ParShare file: Take 5 Card

When It Comes to Making Safety

Please see and distribute the TAG! Cards included with this letter.

The purpose of the TAG program is to improve and promote hazard recognition and encourage everyone to take personal responsibility for their safety and the safety of others.

TAG! does not require completing any forms, but it does require you to:

THINK about the hazards associated with your task

ANALYZE and find safe solutions

GO ahead and complete your task safely

Please distribute these cards to staff and subcontractors working on the BP, Dow, DuPont and Giant Mine programs. Graphics for posting in the office or job site are also available on the client team sharedrives. Use this tool to encourage everyone to TAG for safety.

Remember you also have the authority and responsibility to STOP WORK if unsafe conditions are present or you have concerns. The Workcare Incident Intervention number is also included. This number should be used in the event of a work related injury or illness

Thank you for your efforts and remember TAG! You're it for safety.

Regarding safety,
TAG –you are IT!

Think about the hazards associated with your task

Analyze the hazards and find safe solutions (tools, training, procedures, time)

Go *only after you know you are ready*

Remember, you always have the authority to **STOP WORK** until you are fully prepared.

WorkCare Incident Intervention Contact Number 888-449-7787

PARSONS

OWN ZERO

Be bold.

Own the moment.

Your brain is wired to go along with
social norms and not speak up.

When you see an unsafe act or condition,
speak up to make a difference.

APPENDIX G

ACTIVITY HAZARD ANALYSIS (AHA) FORMS

Note: Attached AHAs are "Living Documents" that should be modified during project activities when non-listed hazards present themselves.

LIST OF AHAS

AHA-001	General Field Activities
AHA-002	Operation of Motor Vehicle
AHA-003	Personal Decontamination
AHA-004	Decontamination of Tools and Equipment
AHA-005	CAMP Operations
AHA-006	Underground Utility Clearance
AHA-007	Hand Auger, Air Knife, and Vac Operations
AHA-008	Drilling Activities and Sample Collection
AHA-009	Borehole/Well Downhole Testing Activities
AHA-010	FLUTe Liner Installation
AHA-011	Monitoring Well Gauging, Slug Testing, and Sampling
AHA-012	Surface Water Sampling
AHA-013	Roll-off or Conex Delivery
AHA-014	IDW Management and Sampling
AHA-015	Access to Residential Properties
AHA-016	Soil Vapor Installation and Air Sampling
AHA-017	Site Surveying
AHA-018	Traffic Management
AHA-019	Activities – Barge or Boat
AHA-020	Operation - Barge or Boat
AHA-021	Vibracore Operations
AHA-022	Sediment Sampling
AHA-023	Sample Processing
AHA-024	Driving To/From Site – Orphan Well Program
AHA-025	Oversight of Drilling Activities – Orphan Well Program
AHA-026	Waste Characterization Sampling – Orphan Well Program
AHA-027	Field Oversight – Site Walk – Orphan Well Program
AHA-028	Site Visit or Site Walk with Ticks and Bio Hazards – Orphan Well Program
AHA-029	Working Near or on Boat on Water

Activity/Work Task: General Field Activities	Overall Risk Assessment Code (RAC) (Use highest code)					M
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**					
Project Number:	**Severity**	**Probability**				
Date Prepared: 1/16/2020		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name): M. Colbert	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name): Greg Ertel	Marginal		M	M	L	L
Employer / GBU: Parsons	Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	Hazards	Controls	P	S	RAC
Outdoor, Indoor, Physical Activity	Heat Stress ▪ Prickly Heat (Heat rash) ▪ Heat Cramps ▪ Heat Exhaustion ▪ Heat Fatigue ▪ Heat Collapse ▪ Heat Stroke	▪ Adjust work schedules. ▪ Mandate work slowdowns as needed. ▪ Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided. ▪ Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods. ▪ Maintain worker's body fluids at normal levels. ▪ Train workers to recognize the symptoms of heat related illness. ▪ Monitor workers physical conditions ▪ Monitor outside temperature versus worker activity. ▪ The SSO will implement the cold/heat stress control program as appropriate to conditions.	S	Cr	M

	Cold Related Injuries Frostbite Hypothermia	▪ Educate workers to recognize the symptoms of frostbite and hypothermia ▪ Have appropriate PPE for the conditions, including jackets, gloves/mittens, winter boots and hat ▪ Identify and limit known risk factors: ▪ Assure the availability of enclosed, heated environment on or adjacent to the site. ▪ Assure the availability of dry changes of clothing. ▪ Assure the availability of warm drinks. ▪ Start (oral) temperature recording at the job site: ▪ At the Field Team Leader's discretion when suspicion is based on changes in a worker's performance or mental status. ▪ At a worker's request. ▪ As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind-chill less than 20oF, or wind-chill less than 30oF with precipitation). ▪ As a screening measure whenever anyone worker on the site develops hypothermia. ▪ The SSO will implement the cold/heat stress control program as appropriate to conditions.	S	Cr	M
	Slips, Trips, Falls	▪ Workers will be aware of potentially slippery surfaces and tripping hazards. Keep all areas dry, clean and free of debris to deter any unnecessary trips and falls. ▪ Avoid, remove, communication, and mark (if possible) hazards. ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself, and plan your route. ▪ Clean up all spills immediately and dispose properly. ▪ Avoid working at dusk, dawn, or at night. Utilize adequate lighting when indoors. ▪ Personnel will notify the SSO of any unsafe conditions.	O	M	M
	Rain	▪ Have proper PPE (i.e. rain gear, footwear, etc) available. Be aware of slip hazards, puddles, etc.	O	M	M
	Sunshine	▪ Have sunscreen available for ultraviolet protection. Have water for dehydration.	S	N	L
	Snow	▪ Have warm clothes available for cold temperatures.	O	N	L
	Lightning	▪ Do not begin or continue work until lightning subsides for 30 minutes. ▪ Check weather forecast; reschedule if there is a severe weather warning.	O	M	M
	High winds, dust storm	▪ Wear goggles if dust/debris is visible. ▪ Stop work if vision is significantly impaired or creates unsafe conditions.	S	N	L

	Pollen	▪ Take medication (i.e. antihistamine) to minimize allergic reaction to pollen. Wear dust mask, if necessary.	O	N	L
	Working Near Water/Drowning Protection	▪ Parsons selects personal flotation devices (PFDs) and requires employees to wear them when work is conducted in areas where the danger of drowning exists. ▪ Don PFD when working within 10 feet of water. ▪ Have a throwable rescue device with 75' rescue line readily available ▪ Buddy system required when working near water	U	Cr	L
	Walking on uneven or wet terrain (i.e. slopes, leaves, covered objects, holes, etc)	▪ Wear steel toe rubber boots versus over-the-shoe rubber boots. Use walking stick or other object for additional support/balance and to check for animal burrows/holes.	O	M	M
	Biological Hazards - insects, rodents, animals, etc.	▪ Wear appropriate clothing (hat, long-sleeve shirt, long pants, gloves, boots, Tyvek, etc.). ▪ Apply bug repellant spray or lotion to exposed skin. ▪ Personnel will be aware of potential exposure to biological hazards. ▪ Perform a tick check throughout and at the end of the day. If a tick is embedded review the Workcare Tick guidance and safely remove as soon as possible. Save tick if possible. If symptoms develop or tick is embedded more than 12 hours call Workcare for guidance.	U	M	L
	Vegetation	▪ Create a clear path or route with mechanical equipment, whenever possible. Wear appropriate PPE for the vegetation (i.e. leather gloves, Carhartt coveralls and face shield for vegetation that could cause cuts/punctures and/or is higher than waist level.	U	M	L
	Traffic (Including Pedestrians)	▪ Use cones, flags, and other traffic control devices to delineate work zone ▪ Don proper PPE, including reflective vest. ▪ Look both ways before exiting vehicle, have an emergency kit in the vehicle. ▪ Refer to AHA 018: Traffic Management.	O	M	M
	Site Hazards Material Exposure	▪ Training and safety awareness of potential exposure to contaminates at the site. ▪ Training of all personnel decontamination procedures (if appropriate to visit). Provide adequate hygiene and decontamination supplies. Refer to AHA 003: Personal Decontamination, and AHA 004: Decontamination of Tools and Equipment. ▪ Practice contamination avoidance work upwind if feasible, limit contact to the extent possible, do not eat in areas with COC's, keep drink containers covered. ▪ Appropriate PPE will be worn dependent on site conditions and actions levels. (if appropriate to visit) ▪ Must sign off on health and safety plan. ▪ Visitor will be escorted around site by an individual with current 40-hour HAZWOPER training, unless cleared with the SSO.	S	M	L

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE (Level D) - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Equipment inspection as necessary, recorded in field book.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 001 General Field Activities** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

NAME	SIGNATURE	COMPANY	DATE	CRAFT	TRAINER	TRAINER SIGNATURE
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Activity/Work Task: Operation of Motor Vehicle	Overall Risk Assessment Code (RAC) (Use highest code)					**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**					
Project Number:	**Severity**	**Probability**				
Date Prepared: 1/17/2020, Revised 3/16/22		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name): M. Colbert: Ed Ashton	Catastrophic	**E**	**E**	**H**	**H**	**M**
	Critical	**E**	**H**	**H**	**M**	**L**
Reviewed by (Name): Greg Ertel	Marginal	**H**	**M**	**M**	**L**	**L**
Employer / GBU: Parsons	Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.)
References:
PSHEP, ESHARP Manual, DASH Card

Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above).
The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.

	RAC Chart
"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	
"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	Hazards	Controls	P	S	RAC
Driving to and from the job site	Vehicle Accident	▪ All employees shall complete the ParsonsU safety module on Defensive Driving. ▪ Plan your travel route and check maps for directions or discuss with colleagues. ▪ Complete a Vehicle Inspection Report before driving and check for proper equipment/supplies. ▪ Clean windows and mirrors as needed throughout the trip. ▪ Have sunglasses available to reduce sun glare and wear as needed. ▪ Follow vehicle maintenance schedule to reduce possibilities of breakdown while driving. ▪ Use Defensive Driving Techniques; avoid following too closely 3-4 second distance, drive within speed limit or as conditions allow, focus on task do not eat or use phone or electronic devices while driving, Get Out And Look (GOAL) before	S	Cr	M

		backing, use a spotter as needed for backing and maneuvering Inspection Requirements Inspect all fluid level, air pressure in tires, adjust mirrors and seat positions appropriately, watch fuel level and fill up when level is low.			
	Environmental Release – fire when fueling, fire in area	▪ Look for gas station in safe area, avoid if heavily congested or in unsafe neighborhood ▪ Do not fuel if others in area are smoking or on cell phones ▪ Do not overfill, stop after pump turns off. ▪ Do not park warm vehicle in tall grass or vegetation ▪ Have a fire extinguisher in the vehicle	U	Cr	L
	Distraction while driving	▪ Stop driving a vehicle, regardless of the speed (i.e. even 5 mph) or location (i.e. private road), when the potential of being distracted by conversation exists.	S	Cr	M
	Fatigue/Falling asleep	▪ Get adequate rest prior to driving. Take a break every 2 hours, do not work and drive more than 12 hours in one day.	S	Cr	M
	Weather /Road conditions	▪ Check road and weather conditions prior to driving. Reschedule trip if advisories are issued or severe weather is forecast	O	M	M
	Theft/Crime of parked vehicle	▪ Lock the vehicle when leaving the area ▪ Store valuables in secure area and cover ▪ Avoid parking in unlit or unsecured areas	U	M	L

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Wear seat belt at all times; make sure that clothing will not interfere with driving.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical	Vehicle inspection checklist

	Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 002 Operation of Motor Vehicle** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

NAME	SIGNATURE	COMPANY	DATE	CRAFT	TRAINER	TRAINER SIGNATURE
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Activity/Work Task: Personnel Decontamination	Overall Risk Assessment Code (RAC) (Use highest code)					**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**					
Project Number:	**Severity**	**Probability**				
Date Prepared: 1/16/2020		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name): M. Colbert	Catastrophic	**E**	**E**	**H**	**H**	**M**
	Critical	**E**	**H**	**H**	**M**	**L**
Reviewed by (Name): Greg Ertel	Marginal	**H**	**M**	**M**	**L**	**L**
Employer / GBU: Parsons	Negligible	**M**	**L**	**L**	**L**	**L**
Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**					
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				**RAC Chart**	
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				**E = Extremely High Risk** **H = High Risk**	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				**M = Moderate Risk** **L = Low Risk**	

Job Steps	**Hazards**	**Controls**	**P**	**S**	**RAC**
Decontaminate personnel exiting from the Exclusion zone	General	▪ Personnel should dress in suitable safety equipment to reduce exposure. ▪ Collect rinse water and dispose of per appropriate standard operating procedures. ▪ Follow decontamination procedures.	S	M	L
	Site Hazardous Material Exposure	▪ Training and safety awareness of potential exposure to chemicals of concern at the site and decontamination procedure. Review chemicals of concern. ▪ Training of all personnel decontamination procedures (if appropriate to visit). Provide adequate hygiene and decontamination supplies. ▪ Practice contamination avoidance, work upwind if feasible, limit contact to the extent possible, do not eat in areas with COC's, keep drink containers covered.	S	M	L

		▪ Appropriate PPE will be worn (e.g. tyvek, nitrile gloves, safety glass…). Workers should decontaminate PPE at the end of each work day or when leaving the site (e.g., boot wash station). ▪ Monitor breathing zone using PID. Refer to PSHEP for action levels. ▪ Must sign off on health and safety plan. ▪ Visitor will be escorted around site by an individual with current 40 hour			
	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	S	M	M
	Traffic (Including Pedestrians)	▪ Use cones, flags, and other traffic control devices to delineate work zone ▪ Don proper PPE, including reflective vest. ▪ Look both ways before exiting vehicle, have an emergency kit in the vehicle. ▪ Review AHA 018: Traffic Management for further controls measurements and hazards.	O	M	M

Activity/Work Task: Personnel Decontamination		Overall Risk Assessment Code (RAC) (Use highest code)			
Job Steps	**Hazards**	**Controls**	**P**	**S**	**RAC**
Decontaminate personnel exiting from the Exclusion zone (Contd)	Slips, Trips, Falls	▪ Workers will be aware of potentially slippery surfaces and tripping hazards. Workers will keep all areas clean and free of debris and dry to deter any unnecessary trips and falls. ▪ Avoid, remove, communication, and mark (if possible) hazards. ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself and plan your route. ▪ Avoid working at dusk, dawn, or at night. Utilize adequate lighting when indoors. ▪ Clean up all spills immediately. ▪ Personnel will notify the SSO of any unsafe conditions.	O	M	M
	Spill/leakage	▪ Workers will have berms or spill absorbent pads nearby to prevent the spread of contaminated water. ▪ Conduct decon activities in flat areas with impervious surfaces (concrete, asphalt, etc) and away from bare ground, surface water, and catch basins. ▪ Decontamination area will be designed to minimize exposure and maintain spill containment.	U	Cr	L
	Splash Hazards/Eye Injury	▪ PPE (safety glasses, splash goggles) will be worn.	S	Cr	M
IDW Management	Refer to AHA 014: IDW Management and Sampling		S	Cr	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent. Decontamination equipment – bucket, brush, alconox, water PPE (Level D) - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Complete daily PID calibration and monthly fire extinguisher inspections.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 003 Personnel Decontamination** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company and Honeywell safety rules, regulations or standards is a condition of my employment. Should I not comply with Company and/or Honeywell safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Decontamination of Tools and Equipment	Overall Risk Assessment Code (RAC) (Use highest code)						M
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**						
Project Number:	**Severity**	**Probability**					
Date Prepared: 01/16/2020		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by (Name): M. Colbert	Catastrophic	E	E	H	H	M	
	Critical	E	H	H	M	L	
Reviewed by (Name): Greg Ertel	Marginal	H	M	M	L	L	
Employer / GBU: Parsons	Negligible	M	L	L	L	L	

Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	Hazards	Controls	P	S	RAC
General/Work Area (Applies to All Job Steps)	General	▪ Personnel should dress in suitable safety equipment to reduce exposure. ▪ Collect rinse water and dispose of per appropriate standard operating procedures. ▪ Follow decontamination procedures. Refer to AHA-001	S	M	L
	Site Hazardous Material Exposure	▪ Training and safety awareness of potential exposure to contaminates at the site and decontamination procedures. ▪ Training of all personnel decontamination procedures (if appropriate to visit). Provide adequate hygiene and decontamination supplies. ▪ Practice contamination avoidance work upwind if feasible, limit contact to the extent possible, do not eat in areas with COC's, keep drink containers	S	M	L

		covered. ▪ Appropriate PPE will be worn (e.g., gloves, splash goggles, Tyvek, etc.). ▪ Must sign off on health and safety plan. ▪ Monitor breathing zone using PID. In addition, use multi-gas meter if using gas-powered equipment or exhaust fumes present. Refer to PSHEP for action levels. ▪ Visitor will be escorted around site by an individual with current 40 hour ▪ Personnel will follow decontamination procedures.			
	Slips, Trips, and Falls	▪ Workers will be aware of potentially slippery surfaces and tripping hazards. Keep all areas dry, clean and free of debris to deter any unnecessary trips and falls. ▪ Avoid, remove, communication, and mark (if possible) hazards. ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself and plan your route. ▪ Clean up all spills immediately and dispose properly. ▪ Avoid working at dusk, dawn, or at night. ▪ Personnel will notify the SSO of any unsafe conditions.	O	M	M
	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	O	M	M
	Traffic (Including Pedestrians)	▪ Use cones, flags, and other traffic control devices to delineate work zone ▪ Don proper PPE, including reflective vest.	O	M	M

		▪ Look both ways before exiting vehicle, have an emergency kit in the vehicle. ▪ Review AHA 018: Traffic Management for further controls measurements and hazards.			
Handling of Equipment	Pinch Points, Hand Injuries, Ergonomics	▪ Always use two persons for movement of heavy equipment (>50 lbs.). Use correct body positioning and posture while heavy. ▪ Wear leather gloves during handling of equipment. Keep hands and feet clear of crush/pinch areas during loading and unloading of equipment	S	M	L
	Foot Injuries	▪ Safety-toed boots should be worn when moving/handling equipment. ▪ Work in teams to move, life, or handle equipment > 50 lbs.	S	M	L
Remove gross contamination with brush.	Damaging equipment or tools Slip or Fall	▪ To clean instrumentation: follow manufacturer's instructions. ▪ Provide a chair or something to hold onto when removing PPE (boots)	O	N	L
	Eye/Face Injuries	▪ Workers shall wear proper PPE (safety glasses or safety shield)	S	M	L
Cleaning/Rinsing with Wash Solution and Water	Spill/leakage	▪ Workers will have berms or spill absorbent pads nearby to prevent the spread of contaminated water. ▪ Conduct decon activities in flat areas with impervious surfaces (concrete, asphalt, etc) and away from bare ground, surface water, and catch basins. ▪ Decontamination area will be designed to minimize exposure and maintain spill containment.	U	Cr	L
	Damaging equipment or tools	▪ Follow manufacturer's instructions. Check that wash solution will not damage instrument.	O	N	L
	Chemical reaction and exposure to wash solution	▪ A Type ABC, 20-lb, fully charged fire extinguisher will be in an accessible area on-site. ▪ Review the chemicals of concern and use appropriate wash solution. ▪ Maintain Safety Data Sheet onsite for wash chemical used. ▪ Wear proper PPE when mixing wash solution and rinsing equipment with solution (safety goggles, nitrile gloves).	U	Cr	L
	Contamination remains	▪ Personnel will repeat proper decontamination procedure.	U	M	L

Use of Pressure Washer	Eye/Face Injuries	▪ Ensure individuals are trained on the proper operation of the pressure washer and understand hazards associated with the pressurized equipment. ▪ Stand/work with back to the wind, if possible. ▪ Keep out of line of fire of pressure washer. Make sure that all workers and bystanders are cleared from area before operating. ▪ Turn off valves when not in use. ▪ Workers shall wear proper PPE (safety glasses with side shields + a face shield) Set-up wastewater collection area, containerize water for proper disposal	S	Cr	M
	Slips, Trips, and Falls	▪ Refer to control measures listed above in General/Work Area job steps for slips, trips, and falls. ▪ Be aware of location of hosing at all times. Mark with cones.	O	M	M
Refueling of Generator	Fire/Explosion	▪ A Type ABC, 20-lb, fully charged fire extinguisher will be in an accessible area on-site. ▪ Prohibit storage of fuel in plastic containers. Store in well ventilated areas and keep away from combustible materials. ▪ Turn off generator before refueling. ▪ No smoking while onsite and when refueling. ▪ Store fuel and generator away from heat sources.	U	Ca	M
	Spill/Release	▪ Have spill absorbent pads nearby to prevent the spread of spilled materials. ▪ Inspect safety gas can for defects (e.g., lid doesn't completely close) before usage, refilling, and during transport. ▪ Conduct refueling activities in flat areas with impervious surfaces (concrete, asphalt, etc) and away from bare ground, surface water, and catch basins. ▪ Keep generator and gas can in secure area when not in use. Properly secure so as to prevent movement during transport.	S	Cr	M
IDW Management	Refer to AHA 014: IDW Management and Sampling		S	Cr	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE (Level D) - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Inspect pressure washer and generator for defects before use. Complete daily calibration of PID and weekly calibration of Multi-gas meter. Conduct monthly fire extinguisher inspections. Inspect that tools have been properly cleaned after use and that contamination does not remain.

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<tr><td>Project Location: New York (Various Locations)</td><td colspan="6">Risk Assessment Code (RAC) Matrix</td></tr>
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<tr><td>Reviewed by (Name): Greg Ertel</td><td>Marginal</td><td>H</td><td>M</td><td>M</td><td>L</td><td>L</td></tr>
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Job Steps	Hazards	Controls	P	S	RAC
CAMP Operations / Ambient Monitoring	Vapors (Including Site COCs and calibration gasses), particulates	▪ Approach area where vapors are suspected from upwind direction and stay upwind/crosswind of potential sources of vapors. (Use flagging to indicate wind direction). Fill calibration gas in a well-ventilated area, preferably outdoors. ▪ Inspection Requirements o Use a PM-10 aerosol and a mini RAE 3000 PID to monitor upwind and down-wind locations during drilling activities. Refer to PSHEP for action levels. o Use a multi-gas meter (multi-RAE) to monitor worker breathing zone during drilling activities. Refer to the PSHEP for action levels. o Regularly inspect cal gas regulator, tedlar bag, and canister. o Monitor workers breathing zone at a minimum of once every 30 minutes.	S	M	L

	Transport, Movement, and Use of Compressed Gasses	▪ Properly secure canisters within vehicle when transporting. ▪ Inspect canisters for signs of leaks and corrosion. ▪ Carefully transport canister to sampling area. ▪ Keep canisters away from ignition or heat sources. ▪ Detach regulator from canister when not in use. ▪ Slowly open values during operation.	S	Cr	M
	Working in Vicinity of Indoor/Outdoor Vehicle Traffic/Active Equipment Operation	▪ Keep out of travel paths of vehicles and roadways, where possible. ▪ Set up traffic cones and flagging to secure work area ▪ Wear Level D PPE and reflective safety vest ▪ Maintain eye contact/communication with facility equipment/vehicle operators. ▪ Review AHA 018: Traffic Management for further controls measurements and hazards.	S	Cr	M
	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	S	Cr	M
	Slips, Trips, Falls	▪ Workers will be aware of potentially slippery surfaces and tripping hazards. Keep all areas dry, clean and free of debris to deter any unnecessary trips and falls. ▪ Avoid, remove, communication, and mark (if possible) hazards. ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Don’t walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself and plan your route. ▪ Clean up all spills immediately and dispose properly. ▪ Avoid working at dusk, dawn, or at night. Utilize adequate lighting when indoors. ▪ Personnel will notify the SSO of any unsafe conditions.	O	M	M

	Manual Lifting/Ergonomic Hazards	• When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports should be considered. • Plan storage and staging to minimize lifting or carrying distances. • Have someone assist with the lift— especially for heavy (> 50lbs.) or awkward loads. (Note: If employee is not capable of carrying 50 lbs. or less, seek assistance.). • Make sure the path of travel is clear prior to the lift. • Use hand carts to move large, awkward loads ▪ Avoid carrying heavy objects above shoulder level.	S	M	L
	Pinch Points	▪ Be aware of potential pinch points. ▪ Utilize leather palmed gloves for all material handling.	S	M	L

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
▪ Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent. ▪ Level D PPE - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. ▪ Equipment: Particulate monitor, PID, calibration gasses, tripod.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	▪ Ongoing environmental condition inspection (weather, wind, heat, cold). ▪ Ongoing personnel inspection (buddy system) ▪ Inspection of work area for general hazards as covered under this AHA prior to beginning any task. ▪ Take 5 Card when appropriate ▪ Get Out and Look (GOAL) ▪ Equipment inspection as necessary, recorded in field book. Inspection condition of CAMP equipment daily. Complete daily calibration of PID, weekly calibration of Multi-gas meter, and monthly inspection of fire extinguishers.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

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Activity/Work Task: Underground Utility Clearance	Overall Risk Assessment Code (RAC) (Use highest code)						**M**	
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**							
Project Number:	**Severity**	**Probability**						
Date Prepared: 1/20/2020, Revised 3/16/22		Frequent	Likely	Occasional	Seldom	Unlikely		
Prepared by (Name): J. Mikochik: Ed Ashton	Catastrophic	E	E	H	H	M		
	Critical	E	H	H	M	L		
Reviewed by (Name): Greg Ertel	Marginal	H	M	M	L	L		
Employer / GBU: Parsons	Negligible	M	L	L	L	L		
Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**							
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				**RAC Chart**			
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				**E = Extremely High Risk** / **H = High Risk**			
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				**M = Moderate Risk** / **L = Low Risk**			

Job Steps	Hazards	Controls	P	S	RAC
Underground Utility Clearance	Slips, Trips, Falls	▪ Workers will be aware of potentially slippery surfaces and tripping hazards. Keep all areas dry, clean and free of debris to deter any unnecessary trips and falls. ▪ Avoid, remove, communication, and mark (if possible) hazards. ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself, and plan your route. ▪ Clean up all spills immediately and dispose properly.	O	M	M

		▪ Avoid working at dusk, dawn, or at night. Utilize adequate lighting when indoors. ▪ Personnel will notify the SSO of any unsafe conditions.			
	General/Access	▪ Use the buddy system ▪ Alert property owner of presence before enter building. Display proper identification (ID badges, business cards, etc). ▪ Avoid moving or touching household items/ personal property without talking to tenants first. ▪ Report any unsafe conditions. Use stop work authority if feeling unsafe	O	M	M
	Chemical – vapors	▪ Monitor area for %O2, %LEL, H2S, CO & VOCs prior to and during work as specified in PSHEP. ▪ Review action levels in the PSHEP.	S	Cr	M
	Manual Lifting/Ergonomic Hazards	▪ When lifting objects, lift using knees not back. For repetitive lifting tasks, the use of lifting braces/supports should be considered. ▪ Plan storage and staging to minimize lifting or carrying distances. ▪ Split heavy loads into smaller loads. Rotate high demand tasks, take breaks as needed ▪ Have someone assist with the lift— especially for heavy (> 50lbs.) or awkward loads. (Note: If employee is not capable of carrying 50 lbs. or less, seek assistance.). ▪ Make sure the path of travel is clear prior to the lift. ▪ Do not lift manhole covers, open/lift hatches or other access points to vessels, tanks or subsurface structures without proper authorization to do so, proper tools and proper personnel protective equipment. ▪ Obey sensible lifting limits (50 lb. Maximum per person manual lifting) ▪ Use hand carts to move large, awkward loads ▪ Avoid carrying heavy objects above shoulder level.	S	M	L
	Sharp Objects/Hand Injuries	▪ Utilize Leather Gloves with Standard PPE ▪ Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects ▪ Use self retracing knifes if needed. ▪ Cut away from the body and never towards another worker. • Maintain all hand and power tools in a safe condition..	O	M	M

Underground Utility Clearance (Cont'd)	Pinch Points	▪ Be aware of potential pinch points. ▪ Utilize leather palmed gloves for all material handling. ▪ Use proper tools, not hands, to open up manholes and covers for utility conduits	S	M	L
	Eye/Foot and Hand Hazards	▪ Eye/Face Protection – Safety glasses with side shields (ANZI Z87.1) ▪ Appropriate safety toed footwear is required ▪ Use sturdy leather work, or specialty gloves as required ▪ Use proper tools (e.g., crowbars) to open up utility conduits and manholes. Keep feet clear of area. ▪ Keep hands, feet and body out of pinch points and hazardous areas ▪ Be aware of surrounding and proximity of other people when handling stakes and other equipment	S	Cr	M
	Electrical Hazards	▪ Where electrical cords are used, use a GFCI in-line cable or extension cord. Check for any frays in the wire and that all 3 prongs are intact. Damaged cords should be taken out of service. ▪ Ensure area is free of standing water and work is completed greater than 5 feet away from water. Inspect extension cords prior to use.	U	Ca	M
	Working in Vicinity of Indoor/Outdoor Vehicle Traffic/Active Equipment Operation	▪ Keep out of travel paths of vehicles and roadways, where possible. ▪ Set up traffic cones and flagging to secure work area ▪ Wear Level D PPE and reflective safety vest ▪ Maintain eye contact/communication with facility equipment/vehicle operators ▪ Refer to AHA 018: Traffic Management.	S	Cr	M
	Confined Space	▪ Monitor air when in vicinity of confined spaces of near potential hazardous atmospheres for %O2, %LEL, H2S, CO & VOCs prior to and during work as specified in PSHEP. ▪ Always use the buddy system. ▪ Be aware of locations of any confined spaces present inside of the facility buiding(s). Consult with knowleagable facility personnel. ▪ Do not enter a confined space unless given a Parsons confined space entry Permit. ▪ Practice safe confined space entry procedure as specified in PSHEP and Confined Space Activity Hazard Analysis.	U	Ca	M

	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	S	Cr	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent. Level D PPE - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Equipment: Various Utility Clearing Equipment, Hand Tools, PID, MultiRAE (depending on location)	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Equipment inspection as necessary, recorded in field book.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

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This is to acknowledge that I have had a chance to review a copy **AHA 006 Underground Utility Clearance** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

NAME	SIGNATURE	COMPANY	DATE	CRAFT	TRAINER	TRAINER SIGNATURE
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Activity/Work Task: Hand Auger, Air Knife, and Vac Operations	Overall Risk Assessment Code (RAC) (Use highest code)						M
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**						
Project Number:	**Severity**	**Probability**					
Date Prepared: 1/20/2020; Revised 03/16/22		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by (Name): J. Mikochik; Ed Ashton	Catastrophic	E	E	H	H	M	
	Critical	E	H	H	M	L	
Reviewed by (Name): Greg Ertel	Marginal	H	M	M	L	L	
Employer / GBU: Parsons	Negligible	M	L	L	L	L	

Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	Hazards	Controls	P	S	RAC

General/Work Area	Slips, Trips, Falls	▪ Use designated walkways whenever possible ▪ Avoid or remove all trip hazards by keeping materials/objects organized and out of walkways. ▪ Keep work surfaces dry ▪ Practice good housekeeping and keep work areas free of debris ▪ When entering residential and commercial buildings, be extra vigilant for hazards, particularly slipping hazards. Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Avoid, remove, communicate and mark (if possible) hazards. ▪ Utilize adequate lighting ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself and plan your route. ▪ Clean up all spills immediately and dispose properly. ▪ Personnel will notify the SSO of any unsafe conditions.	S	Cr	M
	Open Borehole – Fall Hazard	▪ Large-diameter borehole (6-inchs minimum) will require even larger diameter hole to hand clear. ▪ Do not leave open hole overnight, if at all possible. ▪ Cover-up pre-cleared hole with wood or steel surface plate, affix sufficient barricades, and place signage during non-working hours. State measures to be taken in traffic control plan and alert proper agencies of need to block off sidewalk. ▪ Wear protective foot gear (i.e., steel-toed boots). ▪ Stay sufficient distance from borehole when open.	S	Cr	M
	Working in Vicinity of Indoor/Outdoor Vehicle Traffic/Active Equipment Operation	▪ Keep out of travel paths of vehicles and roadways, where possible. ▪ Set up traffic cones and flagging to secure work area ▪ Wear Level D PPE and reflective safety vest ▪ Maintain eye contact/communication with facility equipment/vehicle operators. ▪ Review AHA 018: Traffic Management for further controls measurements and hazards.	S	Cr	M
	Site Hazards Material Exposure	▪ Training and safety awareness of potential exposure to contaminates at the site. ▪ Training of all personnel decontamination procedures (if appropriate to visit). Provide adequate hygiene and decontamination supplies. Refer to AHA 003: Personal Decontamination, and AHA 004: Decontamination of Tools and Equipment.	S	M	L

		▪ Practice contamination avoidance work upwind if feasible, limit contact to the extent possible, do not eat in areas with COC's, keep drink containers covered. ▪ Appropriate PPE will be worn dependent on site conditions and actions levels. Tychem coveralls may be required based on potential for skin contact ▪ Monitoring breathing zone with PID and/or MultiRAE (see AHA-005 CAMP Operations and PSHEP for action levels) ▪ Must sign off on health and safety plan. ▪ Visitor will be escorted around site by an individual with current 40-hour HAZWOPER training, unless cleared with the SSO.			
	Theft of Equipment/Vehicles	▪ Where possible, leave equipment within fenced-in area. ▪ Where equipment or vehicles need to remain overnight outside of fence or if temporarily leaving site with items unattended, ensure that vehicle is locked and values removed to the extent practical. ▪ Be aware of surrounding and keep lookout. ▪ Alert authorities of suspicious activities.	U	M	L
	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	S	M	L
Tool Handling/Lifting	Back Injury, Strains, Sprains	▪ Use proper lifting techniques. Keep back straight, bend the knees, and lift with the legs. Use two people if load is heavier than 50 lbs. or awkward to handle. ▪ Use correct body mechanics while spinning the auger bucket up and down. Keep back straight, knees slightly bent, and only submerge the bucket to a depth equal to the length of the bucket. Never bury the bucket and try to pull it out. Suction from wet soil will make it difficult to remove the bucket from the hole. Take a little bit at a time. Keep all employees clear of the travel path used by the handle on the hand auger. ▪ Take breaks frequently and rotate staff. ▪ Protect your knees with knee pads or other disposable padded material while kneeling on the ground. ▪ Make sure the path of travel is clear prior to the lift. ▪ Maintain clean work zones.	S	M	L

Hand Auger Use	Pinch Points, Lacerations	▪ Keep fingers clear of the metal to metal contact pinch point when connecting the handle to the extensions and auger bucket. ▪ Wear gloves and keep hands and fingers clear of areas that have hinges, articulation, moving parts, and lift gate guide track. Load and unload heavy tools (i.e. jackhammer, air lance, hoses) carefully, keep fingers clear of the point of contact between the tools and the toolbox or storage rack. ▪ Wear proper PPE (leather gloves).	S	M	L
Soft dig - Air Soil Cutting (High Pressure Air for Loosening Soil)	Struck By Flying Debris, Eye Hazards	▪ Do not point air lance at yourself or others. Use two hands to operate air nozzle. Shut off the air lance at the source if it will not be used for a period of 5 minutes or longer. ▪ Check that all mechanical hose connections are secure. Make sure all manual connections are "positive locked" and have safety cables (otherwise known as chokers, hose anchors or whip checks) properly attached. Slowly open valves when charging air pressure to lines in preparation for soft dig air operations. ▪ Wear safety glasses and face shield. Use ground cover over excavation, as needed, to further prevent flying debris. A traffic cone with the air lance pushed down the center through the hole will help contain flying debris. ▪ Ensure individuals are trained on the proper operation of the air lance/vac equipment and understand hazards associated with the pressurized equipment.	O	M	M
	Hearing Damage	▪ Wear hearing protection if sound over 85 DBA, and double hearing protection if noise levels are greater than 90 dBA. Hearing conservation program in place. Hearing Protection – Ear Plugs, either in custom molded, formable, and pre-molded or earmuffs.	S	M	L
	Damage to Underground Utilities from Tool Contact	▪ Do not force tools into the ground to loosen soil and hard objects. Allow compressed air to loosen soil and stones. ▪ Verify underground features have been marked and points are 5' or greater from identified features or variance is approved and onsite. ▪ Ensure that DigSafe notification has been completed and all utilities are marked-out. ▪ Check site blueprints/drawings and contact knowledgeable personnel to verify locations of additional utilities and subsurface conduits. ▪ Have emergency telephone number available	S	M	L
	Slips, Trips, and Falls	▪ Refer to General/Work Area job step above. ▪ Be aware of location of hosing at all times. Mark with cones.	S	Cr	M
IDW Management	Refer to AHA 014: IDW Management and Sampling		S	Cr	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent. Level D PPE - Long pants, safety glasses/face shield, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Equipment: PID, hand tools, vac truck	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Ensure all mechanical hose connections are secure. Make sure all manual connections are "positive locked" and have safety cables (otherwise known as chokers, hose anchors or whip checks) properly attached. Confirm Digsafe NY, One Call or other appropriate locaters have been called (verify utility clearance form from Project Manager) and have responded to mark-out requests.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

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Activity Hazards Analysis - Drilling Activities and Sample Collection

Activity/Work Task: Drilling Activities and Sample Collection	**Overall Risk Assessment Code (RAC) (Use highest code)**					**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**					
Job Number:	**Severity**	**Probability**				
Date Prepared: 2/11/2020, Revised 3/16/22		**Frequent**	**Likely**	**Occasional**	**Seldom**	**Unlikely**
Prepared by (Name/Title): J. Mikochik, Ed Ashton	**Catastrophic**	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name/Title): Greg Ertel	**Marginal**	H	M	M	L	L
	Negligible	M	L	L	L	L
Employer/GBU: INF	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). The RAC is developed after correctly identifying all the hazards and fully implementing all controls.					
Notes: (Field Notes, Review Comments, etc.) Level D: Hard hats, safety glasses, steel-toed boots (or equivalent), high visibility vest, gloves, ear plugs/muffs Tyvek as needed for bio or general contact hazards. Upgrade to Level C not anticipated. If air monitoring indicates work cannot be conducted in Level D, work will stop, contact HS. PSHEP, ESHARP Manual, DASH Card	**P "Probability"** is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				**RAC Chart**	
	S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				E = Extremely High Risk H = High Risk M = Moderate Risk	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				L = Low Risk	

Job Steps	Hazards	Controls	P	S	RAC
General Drilling Activities (i.e. maneuvering drilling equipment at the site, drilling, handling soil cuttings, heavy equipment use)	General Chemical Exposure	• Monitor breathing zone with multi-gas meter according to action levels in the PSHEP. • Follow proper decontamination procedures when leaving the work area and "exclusion zone" Establish a demarcated work area with cones and tape as needed to keep pedestrians and personnel that are not trained and qualified out of the work area.	S	M	L
Mobilize and Set-up Drilling Equipment and Compressor	Equipment Operation	• Verify air compressor vessel is approved and inspected before use • Inspect compressed air lines and connections – use Whip Checks on all connections	S	C	M

		• Hearing Protection required when working in proximity to loud equipment (if it is difficult to communicate in normal voice) • Only qualified operators will be allowed to operate heavy equipment, per safe work guidelines included in the OSHA General Industry (29 CFR 1910) and Construction Industry (29 CFR 1926) standards. • Conduct daily pre-use inspection of drill rig and equipment • Personnel will never walk directly behind or to the side of operating equipment without the operator's knowledge. • Do not wear loose-fitting clothing or other items such as rings or watches that could get caught in moving parts. Long hair will be restrained. • Maintain eye contact and exercise hand signals prior to maneuvering equipment. • No cell phone use while operating equipment or when in close proximity to rig. • Stand clear of rotating objects (i.e. spinning augers) • Conduct rig tower inspection anytime tower is down between drilling locations and prior to drilling. • Use caution when approaching drill rig and minimize time in work area as much as possible. • Alert drillers of anything out of the ordinary with drill rig components.			
Material handling	Proper lifting techniques	• Bend from the knees when lifting objects from the ground up • Ask for help in lifting sand bags, augers, or other tools and equipment. Do not lift over 50 lbs with single person lift • Rotate high demand tasks among staff, take breaks as needed	S	M	**L**

Moving around site	Slip, trips, falls	• Monitor work area for any potential holes, steps or other trip hazards. • Keep work areas clear of debris or tools • Close all well boxes when not in use. Open well boxes pose a trip and fall hazard. • Clean all surfaces of any bentonite residues. Wet bentonite may pose a slip and fall hazard • Wear safety boots fully laced in good condition with adequate tread	S	C	**M**
Drilling, handling augers and other equipment	Pinch points, rotating objects	• Identify all pinch points prior to start of work • Only trained qualified rig operator to work in hazard area • Instruct all not to touch rotating augers, stand clear • Inspect emergency shut-off switches on the vehicles.	S	C	**M**
Vehicle Traffic	Damage to property Struck by/against	• All vehicles used at the site, including personal and rental vehicles, must be inspected daily • Use proper traffic control (cones, advance warning signs) when blocking traffic lanes or shoulders • Follow all posted signs and speed limits. • Drive defensively do not talk on cell phone or use electronic device while driving • Use a spotter when backing or for tight maneuvers • Wear an orange traffic safety vest when working around heavy equipment or near vehicular traffic.	U	M	**L**

Equipment to be Used	Training Requirements/Competent or Qualified Personnel	Inspection Requirements
Direct push drill rig (Geoprobe), Hollow Stem Augers, hand tools, power tools	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher training. *Parson personnel shall not operate any subcontractor equipment.*	1. Daily equipment inspection (i.e. hydraulic and compressed air lines, fire extinguishers, shut-off switches, back up sirens, tools) and all tower components. 2. Check PPE for abnormal wear and tear, rips, etc.

		3. Look for objects that could pose potential trip hazards. 4. Survey work area for overhead hazards, flying debris/particulates or splashes, vehicle traffic or heavy equipment operation, loud noises, etc.

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Activity/Work Task: Borehole/Well Downhole Testing Activities	Overall Risk Assessment Code (RAC) (Use highest code)						**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**						
Project Number:	**Severity**	**Probability**					
Date Prepared: 1/20/2020, Revised 3-17-22		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by (Name): J. Mikochik, Ed Ashton	Catastrophic	E	E	H	H	M	
	Critical	E	H	H	M	L	
Reviewed by (Name): Greg Ertel	Marginal	H	M	M	L	L	
Employer / GBU: Parsons	Negligible	M	L	L	L	L	

Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Cards	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	**Hazards**	**Controls**	**P**	**S**	**RAC**
General/Work Area	Slips, Trips, Falls	▪ Use designated walkways whenever possible. ▪ Avoid or remove all trip hazards by keeping materials/objects organized and out of walkways. ▪ Keep work surfaces dry. ▪ Practice good housekeeping and keep work areas free of debris. ▪ Avoid, remove, communicate and mark (if possible) hazards. ▪ Utilize adequate lighting. ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of	S	Cr	M

		fall. Do not carry more than 50 lbs by yourself and plan your route. ▪ Clean up all spills immediately and dispose properly. ▪ Personnel will notify the SSO of any unsafe conditions.			
	Open Borehole – Fall Hazard, Contaminant Migration	▪ Large-diameter (anticipated 6 inches, but potentially up to 12 inches) will be left in-place overnight. ▪ Cover-up borehole with wood or steel surface plate, affix sufficient barricades, and place signage during non-working hours. State measures to be taken in traffic control plan and alert proper agencies of need to block off sidewalk. ▪ Wear protective foot gear (i.e., steel-toed boots). ▪ Stay sufficient distance from borehole when open. ▪ Install appropriate technology (e.g., FLuTE liners) when borehole left open for extended periods to prevent or reduce potential contaminant migration to deeper areas of the aquifer. ▪ Practice good housekeeping when setting up around the borehole	S	Cr	M
	Working in Vicinity of Indoor/Outdoor Vehicle Traffic/Active Equipment Operation	▪ Keep out of travel paths of vehicles and roadways, where possible. ▪ Set up traffic cones and flagging to secure work area ▪ Wear Level D PPE and reflective safety vest ▪ Maintain eye contact/communication with facility and subcontractor's equipment/vehicle operators. ▪ Review AHA 018: Traffic Management for further controls measurements and hazards.	S	Cr	M
	Site Hazards Material Exposure	▪ Training and safety awareness of potential exposure to contaminates at the site. ▪ Training of all personnel decontamination procedures (if appropriate to visit). Provide adequate hygiene and decontamination supplies. Refer to AHA 003: Personal Decontamination, and AHA 004: Decontamination of Tools and Equipment. ▪ Practice contamination avoidance work upwind if feasible, limit contact to the extent possible, do not eat in areas with COC's, keep drink containers covered. ▪ Appropriate PPE should be worn, i.e., safety glasses, nitrile + work gloves, steel toed boots. ▪ Monitoring breathing zone with PID and/or MultiRAE according to action levels listed in PSHEP. ▪ Keep Safety Data Sheets for chemicals on site ▪ Must sign off on health and safety plan. ▪ Visitor will be escorted around site by an individual with current 40-hour HAZWOPER training, unless cleared with the SSO.	S	M	L

	Fire/Explosion	▪ No smoking within the work area. ▪ Provide ABC (or equivalent) fire extinguishers	U	Ca	M
	Theft of Equipment/Vehicles	▪ Where possible, leave equipment within fenced-in area. Do not leave equipment unattended out in unsecured areas. ▪ Ensure that vehicle is locked and values removed to the extent practical. ▪ Be aware of surrounding and keep lookout. ▪ Alert authorities of suspicious activities.	U	M	L
	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	S	M	M
Borehole Geophysical Activities, Fluid Replacement Testing	Gravity – falling objects	▪ Secure equipment to make sure it does not move. ▪ Wear proper PPE – hard hat, safety glasses, steel toed boots.	S	Cr	M
	Pinch Points, Sharp Objects	▪ Be aware of potential pinch points. Keep hands and other body parts out of the line of fire. ▪ Avoid running hands along sharp edge of casing. ▪ Utilize leather palmed gloves for all material handling. ▪ Always cut away from body and hands	S	M	L
	Equipment Loss or Damage	▪ When handling make sure to have a good grip on the instrument to avoid dropping and damaging the instrument. Lay instruments flat away from the edge on a clean uncluttered work area.	U	N	L
	Ergonomics	▪ Use mechanical means (hand carts, trucks) to lift if the weight is awkward or the weight is greater than 50 pounds individually or 80 pounds for team lifting. ▪ Avoid performing the same strenuous activity for extended periods. ▪ Bend at knees when lifting equipment	O	M	M
	Struck By, Protruding Objects, Liquid Spills/Splashes	▪ Wear safety goggles, hard hat, and steel toed boots during pumping operations. Establish exclusion zone. ▪ Identify and understand parts of equipment which may cause crushing, pinching, rotating, or similar injuries.	S	Cr	M
	Pinch Points	▪ Inspect equipment daily for any defects. Identify and understand parts of equipment which may cause crushing, pinching, rotating, or similar injuries ▪ Wear thick work gloves when handling reel.	S	Cr	M

	Slips, Trips, and Falls	▪ Refer to general slips, trips, and falls hazards in General/Work Area job step above. ▪ Be aware of location of hosing and equipment cords at all times. Mark with cones.	S	Cr	M
Winch Operations	Pinch Points, Moving Equipment	▪ Inspect winch daily for any defects. Identify and understand parts of equipment which may cause crushing, pinching, rotating, or similar injuries ▪ Clear area of obstructions and communicate with all workers involved when winch in-use. ▪ Do not exceed manufactures recommended speed or other specifications. ▪ Keep all guards in place during use ▪ Stay clear of moving parts. ▪ Do not wear loose clothing. Wear appropriate PPE, including leather gloves, steel-toed boots, safety glasses, hard hat, and reflective vest at all times. ▪ Know the location of kill switch.	S	Cr	M
Drum or Tote Handling (Transporting, Moving, Opening, and Closing)	General	▪ Refer to AHA 014: IDW Management and Sampling	S	Cr	M
Mixing/Pumping Operations to/from Drums and Totes	Ergonomics	▪ Where possible, avoid lifting drums or totes with filled contents. Transfer contents to staging area containers using sump/trash pump.	O	M	M
	Hand Injury, Pinch Points	▪ Thick gloves will be worn while completing mixing operations	U	M	L
	Slips, Trips, and Falls	▪ Refer to general slips, trips, and falls hazards in General/Work Area job step above. ▪ Be aware of location of hosing at all times. Mark with cones.	S	Cr	M
	Pressure Bursts	▪ Beware of joints and weak points in the hose during pump operations. Avoid stepping over hose as much as possible. If burst were to occur, stay away from the breach in the hose and turn off pump immediately.	S	Cr	M
	Mixing/Filling Operations – Liquid Splashes, Eye Injuries	▪ If a pump is used to transfer drum/tote contents, ensure that pump hosing is sufficient secured inside of tank or drum, using clamps where necessary. Do not turn on pump until hosing is secured into transfer tank. Turn off pump when not in use. ▪ Wear safety goggles when performing mixing operations	S	M	L

	Electrical Hazards	▪ Inspect extension cords for equipment prior to use. Check for any frays in the wire. Damaged cords should be taken out of service. ▪ If a car or marine battery is used as electrical source, check for signs of corrosion. Attach and tighten each cable one at a time (posited/red first, black/negative second). Avoid placing near water.	U	Ca	M
	Environmental Release	▪ Inspect Spill Kit supplies & locate spill kits prior to performing maintenance. ▪ Care will be taken that the liquid being placed in the drum does not spill onto the top of the drum or the ground. Use a drum funnel to assist in the task. ▪ If a pump is used to transfer drum/tote contents, ensure that pump hosing is sufficient secured inside of tank or drum, using clamps where necessary. Do not turn on pump until hosing is secured into transfer tank/drum. Turn off pump when not in use. ▪ Secondary containment will be used for added protection, such as a spill pallet or plastic sheeting contained by berms.	U	M	L
Equipment Decontamination	Refer to AHA 004: Decontamination of Tools and Equipment		S	Cr	M
Transferring of Drum/Tote Contents into Frac Tank	Refer to AHA 014: IDW Management and Sampling		S	Cr	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent. Level D PPE - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Equipment: PID, MultiRAE, calibration gasses, downhole equipment, water level transducers, pumps and associated tubing/hosing, power source (e.g., battery), drum wrench.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Complete daily calibration of PID, weekly calibration of Multi-gas meter, and monthly inspection of fire extinguishers.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 009 Borehole/Well Downhole Testing Activities** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: FLUTe Liner Installation	Overall Risk Assessment Code (RAC) (Use highest code)						**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**						
Project Number:	**Severity**	**Probability**					
Date Prepared: 1/20/2020, Revised 3-17-22		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by (Name): J. Mikochik, Ed Ashton	Catastrophic	**E**	**E**	**H**	**H**	**M**	
	Critical	**E**	**H**	**H**	**M**	**L**	
Reviewed by (Name): Greg Ertel	Marginal	**H**	**M**	**M**	**L**	**L**	
Employer / GBU: Parsons	Negligible	**M**	**L**	**L**	**L**	**L**	
Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**						
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				**RAC Chart**		
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				**E = Extremely High Risk** **H = High Risk**		
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				**M = Moderate Risk** **L = Low Risk**		

Job Steps	Hazards	Controls	P	S	RAC
General/Work Area	Slips, Trips, Falls	▪ Use designated walkways whenever possible ▪ Avoid or remove all trip hazards by keeping materials/objects organized and out of walkways. ▪ Keep work surfaces dry ▪ Practice good housekeeping and keep work areas free of debris ▪ Avoid, remove, communicate and mark (if possible) hazards. ▪ Utilize adequate lighting ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket	S	Cr	M

		in case of fall. Do not carry more than 50 lbs by yourself and plan your route. ▪ Clean up all spills immediately and dispose properly. ▪ Personnel will notify the SSO of any unsafe conditions.			
	Open Borehole – Fall Hazard, Contaminant Migration	▪ Large-diameter (anticipated 6 inches, but potentially up to 12 inches) will be left in-place overnight. ▪ Cover-up borehole with wood or steel surface plate, affix sufficient barricades, and place signage during non-working hours. State measures to be taken in traffic control plan and alert proper agencies of need to block off sidewalk. ▪ Wear protective foot gear (i.e., steel-toed boots). ▪ Stay sufficient distance from borehole when open. ▪ Practice good housekeeping when setting up around the borehole	S	Cr	M
	Working in Vicinity of Indoor/Outdoor Vehicle Traffic/Active Equipment Operation	▪ Keep out of travel paths of vehicles and roadways, where possible. ▪ Set up traffic cones and flagging to secure work area. Removing the FLUTe liner requires a large amount of space. Make sure the area is properly coned off to prevent any vehicle/pedestrian traffic around the removal zone. ▪ Wear Level D PPE and reflective safety vest ▪ Maintain eye contact/communication with facility and subcontractor's equipment/vehicle operators. ▪ Review AHA 018: Traffic Management for further controls measurements and hazards.	S	Cr	M
	Site Hazards Material Exposure	▪ Training and safety awareness of potential exposure to contaminates at the site. ▪ Training of all personnel decontamination procedures (if appropriate to visit). Provide adequate hygiene and decontamination supplies. Refer to AHA 003: Personal Decontamination, and AHA 004: Decontamination of Tools and Equipment. ▪ Practice contamination avoidance work upwind if feasible, limit contact to the extent possible, do not eat in areas with COC's, keep drink containers covered. ▪ Appropriate PPE should be worn during FLUTe liner installation/removal activities i.e., safety glasses, nitrile + work gloves, steel toed boots. ▪ Monitoring breathing zone with PID and/or MultiRAE according to action levels in the PSHEP. ▪ Keep Safety Data Sheets for chemicals on site. ▪ Must sign off on health and safety plan.	S	M	L

		▪ Visitor will be escorted around site by an individual with current 40-hour HAZWOPER training, unless cleared with the SSO.			
	Theft of Equipment/Vehicles	▪ Where possible, leave equipment within fenced-in area. Do not leave equipment unattended out in unsecured areas. ▪ Ensure that vehicle is locked and values removed to the extent practical. ▪ Be aware of surrounding and keep lookout. ▪ Alert authorities of suspicious activities.	U	M	L
	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	S	M	M
FLUTe Liner Installation/Removal	Gravity – falling objects	▪ Secure equipment to make sure it does not move. ▪ Wear proper PPE – hard hat, safety glasses, steel toed boots.	S	Cr	M
	Pinch Points, Sharp Objects	▪ Be aware of potential pinch points. Keep hands and other body parts out of the line of fire. ▪ Avoid running hands along sharp edge of casing. ▪ Utilize leather palmed gloves for all material handling. ▪ Always cut away from body and hands	S	M	L
	Equipment Loss or Damage	▪ When handling make sure to have a good grip on the instrument to avoid dropping and damaging the instrument. Lay instruments flat away from the edge on a clean uncluttered work area.	U	N	L
	Ergonomics	▪ Use mechanical means (hand carts, trucks) to lift if the weight is awkward or the weight is greater than 50 pounds individually or 80 pounds for team lifting. ▪ Avoid performing the same strenuous activity for extended periods – take breaks often. ▪ Bend at knees when lifting equipment and when lowering/removing FLUTe liner.	O	M	M
	Struck By, Protruding Objects, Liquid Spills/Splashes	▪ Wear safety goggles, hard hat, and steel toed boots during FLUTe Liner installation and removal. Lower and retrieve FLUTe Liner slowly. Establish exclusion zone. ▪ Identify and understand parts of equipment which may cause crushing, pinching,	S	Cr	M

		rotating, or similar injuries.			
	Pressure Bursts	▪ Beware of joints and weak points in the hose while turned off. Avoid stepping over hose as much as possible. If burst were to occur, stay away from the breach in the hose and turn off pump immediately.	S	Cr	M
	Slips, Trips, and Falls	▪ Refer to general slips, trips, and falls hazards in General/Work Area job step above. ▪ Be aware of location of hosing and equipment cords at all times. Mark with cones. ▪ Use proper housekeeping techniques in work area. ▪ Keep area dry – avoid water spillage when filling FLUTe liner.	S	Cr	M
	Environmental Release	▪ Place plastic or poly sheeting under the FLUTe liner to prevent contamination from contacting the ground surface. ▪ If a pump is used to transfer FLUTe Liner water into drums/totes, ensure that pump hosing is sufficient secured inside of tank or drum, using clamps where necessary. Do not turn on pump until hosing is secured into transfer tank/drum. Turn off pump when not in use. ▪ Secondary containment will be used for added protection, such as a spill pallet or plastic sheeting contained by berms.	S	M	L
	Electrical Hazards	▪ Inspect extension cords for equipment prior to use. Check for any frays in the wire. Damaged cords should be taken out of service. ▪ If a car or marine battery is used as electrical source, check for signs of corrosion. Attach and tighten each cable one at a time (posited/red first, black/negative second). Avoid placing near water.	U	Ca	M
Refueling Activities, Generator Usage	Fire/Explosion	▪ A Type ABC, 20-lb, fully charged fire extinguisher will be in an accessible area on-site. ▪ Prohibit storage of fuel in plastic containers. Store in well ventilated areas and keep away from combustible materials. ▪ Turn off generator or vehicle before refueling. ▪ No smoking while onsite and when refueling. ▪ Store fuel and generator away from heat sources.	U	Ca	M
	Spill/Release	▪ Have spill absorbent pads nearby to prevent the spread of spilled materials. ▪ Inspect safety gas can for defects (e.g., lid doesn't completely close) before usage,	S	Cr	M

		refilling, and during transport. ▪ Conduct refueling activities in flat areas with impervious surfaces (concrete, asphalt, etc) and away from bare ground, surface water, and catch basins. ▪ Keep generator and gas can in secure area when not in use. Properly secure so as to prevent movement during transport.			
	Vapors/Exhaust	▪ Position generator so that exhaust is downwind. ▪ Monitoring for exhaust fumes/fuel in work area with MultiRAE and PID.	S	Cr	M
Equipment Decontamination	Refer to AHA 004: Decontamination of Tools and Equipment		S	Cr	M
IDW Handling	Refer to AHA 014: IDW Management and Sampling		S	Cr	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent. Level D PPE - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Equipment: PID, MultiRAE, calibration gasses, FLUTe liners, reel, hosing, generator, gas cans, tripod, pump, tubing, marine battery, drum wrench/opener.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Complete daily calibration of PID, weekly calibration of Multi-gas meter, and monthly inspection of fire extinguishers.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 010 FLUTe Liner Installation** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Monitoring Well Gauging, Slug Testing, and Sampling	Overall Risk Assessment Code (RAC) (Use highest code)						M
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**						
Project Number:	**Severity**	**Probability**					
Date Prepared: 1/16/2020		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by (Name): M. Colbert	Catastrophic	E	E	H	H	M	
	Critical	E	H	H	M	L	
Reviewed by (Name/Title): Greg Ertel	Marginal	H	M	M	L	L	
Employer / GBU: Parsons	Negligible	M	L	L	L	L	

Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, EHSARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	Hazards	Controls	P	S	RAC
General/Work Area	Slips, Trips, Falls	▪ Use designated walkways whenever possible ▪ Avoid or remove all trip hazards by keeping materials/objects organized and out of walkways. ▪ Keep work surfaces dry ▪ Practice good housekeeping and keep work areas free of debris ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Avoid, remove, communicate and mark (if possible) hazards. ▪ Utilize adequate lighting ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall.	S	M	L

		▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself, and plan your route. ▪ Clean up all spills immediately, and dispose properly. ▪ Personnel will notify the SSO of any unsafe conditions.			
	Working in Vicinity of Indoor/Outdoor Vehicle Traffic/Active Equipment Operation	▪ Keep out of travel paths of vehicles and roadways, where possible. ▪ Set up traffic cones and flagging to secure work area ▪ Wear Level D PPE and reflective safety vest ▪ Maintain eye contact/communication with facility and subcontractor's equipment/vehicle operators. ▪ Review AHA 018: Traffic Management for further controls measurements and hazards.	S	Cr	M
	Site Hazards Material Exposure	▪ Training and safety awareness of potential exposure to contaminants at the site. ▪ Training of all personnel decontamination procedures. Provide adequate hygiene and decontamination supplies. ▪ Practice contamination avoidance, work upwind if feasible, limit contact to the extent possible, do not eat in areas with COC's, keep drink containers covered. ▪ Appropriate PPE will be worn dependent on-site conditions and actions levels. ▪ Monitoring breathing zone with PID and/or Multi-gas meter. ▪ Keep Safety Data Sheets for chemicals on site ▪ Must sign off on health and safety plan. ▪ Keep all sampling supplies and bottles upwind or crosswind. ▪ Visitor will be escorted around site by an individual with current 40 hour HAZWOPER training, unless cleared with the SSO.	S	M	L
	Theft of Equipment/Vehicles	▪ Do not leave equipment unattended. Place equipment in vehicle when not in use and ensure that vehicle is locked. ▪ Be aware of surrounding and keep lookout. ▪ Alert authorities of suspicious activities.	U	M	L
	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	S	M	M
	Slips, Trips, and Falls	▪ Refer to General/Work Area above.	S	M	L

Mobilization / Staging	Back Injury, Strains, Sprains, Foot Injuries	▪ Observe proper lifting techniques – lift with legs, elbows in, and keep back straight. ▪ Team lift large/awkward loads. ▪ Use mechanical means to lift if the weight is awkward or the weight is greater than 50 pounds individually or 80 pounds for team lifting. ▪ Use mechanical devices (e.g., wagon, sled) to transport equipment over long distances. ▪ Take breaks frequently and rotate staff. ▪ Protect your knees with knee pads or other disposable padded material while kneeling on the ground. ▪ Keep equipment secure until needed. And avoid stacking Wear steel-toed boots.	S	M	L
Open Monitoring Well and Obtain Depth Measurements	Pinch Points	▪ Don proper PPE (work gloves and nitrile gloves) and unlock/open well. Use appropriate tools (socket wrench, pry bar) to assist with opening flush mount wells, do not use bare hands.	S	M	L
	Back Injury, Strains, Sprains	▪ Protect your knees with knee pads or other disposable padded material while kneeling on the ground. ▪ Use proper lifting techniques. Keep back straight, bend the knees, and lift with the legs. Use two people if load is heavier than 50 lbs. or awkward to handle.	S	M	L
	Site Hazards Material Exposure, Vapors, Splash Hazards	▪ Review above measures for General/Work Area. ▪ Stand upwind when opening well and obtaining depth measurements. ▪ Obtain PID and/or Mulit-gas readings of well inner casing prior to and immediately after removing inner cap. Record measurements on field log. ▪ Monitor breathing zone with PID and/or Multi-gas meter. Review Action Level Criteria in the PSHEP. If elevated readings persist for greater than 5 minutes, close-up/cap well, stop work, and leave the area. ▪ Use appropriate decontamination procedures. Refer to AHA 003: Personal Decontamination, and AHA 004: Decontamination of Tools and Equipment. ▪ Wear safety glasses and nitrile gloves. ▪ Reel-up water level monitoring device slowly.	S	M	L
Groundwater Sampling and Slug Testing	Sharp Objects (Tubing Cutter, Lab Glassware), Pinch Points	▪ Wear cut-resistant gloves when cutting tubing, rope, or twine. ▪ Close and safely store cutters when not in use. ▪ Visually inspect cooler upon opening for signs of damaged bottleware and broken glass. Wear cut-resistant and nitrile gloves. ▪ Be aware of the potential presence of pinch points when handling equipment (e.g., opening and closing equipment cases, metal-to-metal contact). ▪ Use nitrile and work gloves when attaching affixing tubing to pump. For motorized pump, keep hands clear of moving parts.	O	M	M

	Exposure to Contaminants and/or Preservatives	▪ Wear nitrile gloves when handling all environmental media and bottleware. ▪ Visually inspect cooler upon opening for signs of damaged or improperly capped bottleware which may have leaked preservatives.			
	Back Injury, Strains, Sprains	▪ Protect your knees with knee pads or other disposable padded material while kneeling on the ground. ▪ Use proper lifting techniques. Keep back straight, bend the knees, and lift with the legs. Use two people if load is heavier than 50 lbs. or awkward to handle.	S	M	L
	Site Hazards Material Exposure, Vapors, Splash Hazards	▪ Review above measures for General/Work Area. ▪ Stand upwind of well location. Establish exclusion zone around monitoring well/sampling area. ▪ Monitor breathing zone continuously with PID and/or Multi-gas readings. Obtain periodic headspace measurements from well casing and from purge container. ▪ Use appropriate decontamination procedures. Refer to AHA 003: Personal Decontamination, and AHA 004: Decontamination of Tools and Equipment. ▪ Wear nitrile gloves and safety glasses at all times while purging, handling bottleware, sampling, and containerizing groundwater. Ensure that purge water containers are properly sealed before moving/transporting, and use proper hazard communication. ▪ Lower and remove pump, tubing, and other equipment from well slowly.	S	M	L
	Electrical Hazards	▪ Inspect extension cords for pump and related devices prior to use. Check for any frays in the wire. Damaged cords should be taken out of service or replacement equipment should be obtained. ▪ If a car or marine battery is used as electrical source, check for signs of corrosion. Attach and tighten each cable one at a time (posited/red first, black/negative second). Avoid placing near water. ▪ Avoid working in heavy precipitation. Shut off or remove power sources to any electronic equipment and move to dry area.	U	Ca	M
	Slips, Trips, and Falls	▪ Review above measures for General/Work Area. ▪ Be aware of the location of tubing and electrical cords at all times. Places cones on top as appropriate.	S	M	L
Packing Sample Coolers	Pinch points, Cuts from Glassware, Exposure to Preservatives	▪ Maintain awareness of procedures and be attentive while handling glassware ▪ Use care and do not rush. Coolers can be heavy. Cooler lids and bottles can be pinch points. ▪ Watch trunk/tailgate as coolers are placed in field vehicles to ship samples. ▪ When packing coolers, inspect the sample containers for damage using a combination of cut-resistant and nitrile gloves. ▪ Visually inspect coolers before placing hands inside. ▪ Always cut away from body and hands.	O	M	M

	Back Injury, Strains, Sprains	▪ Use proper lifting techniques. Keep back straight, bend the knees, and lift with the legs. Use two people if load is heavier than 50 lbs. or awkward to handle. ▪ Use mechanical means (e.g., sled, wagon, hand cart) to move and transport sample coolers.	S	M	L
Decontamination	Refer to AHA 004: Decontamination of Tools and Equipment		S	M	M
IDW Management	Refer to AHA 014: IDW Management and Sampling		S	M	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Modified Level D- Long pants, safety glasses, hard hat (when required), steel-toed boots, nitrile outer gloves, cut proof inner gloves, safety glasses or goggles, high-visibility vest/clothing. Equipment: peristaltic pump, bladder pump, pump accessories (e.g., control box, air supply), marine battery, tubing, tubing cutters, water level meter, water quality meter, slug, water level transducers, sample bottleware, coolers, bags of ice. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc., fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system). Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate. Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Complete daily calibration of PID, weekly calibration of Multi-gas meter, and monthly inspection of fire extinguishers.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 011 Monitoring Well Gauging and Sampling** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Surface Water Sampling	Overall Risk Assessment Code (RAC) (Use highest code)					M
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**					
Project Number:	**Severity**	**Probability**				
Date Prepared: 1/16/2020		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name): M. Colbert	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name/Title): Greg Ertel	Marginal	H	M	M	L	L
Employer / GBU: Parsons	Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.)
References:
PSHEP, EHSARP Manual, DASH Card

Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above).
The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.

	RAC Chart
"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	
"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	**Hazards**	**Controls**	**P**	**S**	**RAC**
Surface Water Sampling	Working on the water - drowning potential	▪ Check with cement plant about delivery schedule, confirm area is clear of boat traffic ▪ Wear footwear that has sufficient traction to reduce risk of slipping. ▪ Pay close attention to weight distribution when filling surface water sample bottleware on the edge of the riverbank. ▪ Wear a personal floatation device while conducting surface water sampling if within 10 feet of river's edge and whenever danger of falling into river exists. ▪ Have a throwable rescue device with 75' rescue line readily available ▪ Buddy system required when working near water	U	Cr	L
	Slips, Trips, Falls	▪ Use designated walkways whenever possible ▪ Avoid or remove all trip hazards by keeping materials/objects organized and out of walkways.	S	M	L

		▪ Keep work surfaces dry ▪ Practice good housekeeping and keep work areas free of debris ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Avoid, remove, communicate and mark (if possible) hazards. ▪ Utilize adequate lighting ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself, and plan your route. ▪ Clean up all spills immediately, and dispose properly. ▪ Personnel will notify the SSO of any unsafe conditions.			
	Site Hazards Material Exposure, Vapors, Sample Preservatives, Splashes	▪ Training and safety awareness of potential exposure to contaminants at the site. ▪ Training of all personnel decontamination procedures. Provide adequate hygiene and decontamination supplies. Refer to AHA 003: Personnel Decontamination, and AHA 004: Decontamination of Tools and Equipment. ▪ Practice contamination avoidance, work upwind if feasible, limit contact to the extent possible, do not eat in areas with COC's, keep drink containers covered. ▪ Appropriate PPE will be worn dependent on-site conditions and actions levels. At a minimum, steel toed boots, nitrile gloves, and safety glasses should be worn when handling contaminated water and sample bottleware ▪ Monitoring breathing zone with PID and/or Multi-gas meter. ▪ Keep Safety Data Sheets for chemicals on site ▪ Must sign off on health and safety plan.	S	M	L
	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	S	M	M
	Sharp Objects, Pinch Points	▪ Maintain awareness of procedures underway and be attentive of sampling operations. Be aware of potential equipment-related pinch points. ▪ Don proper PPE (work gloves and nitrile gloves) when handling sampling equipment. ▪ Wear cut-resistant gloves while cutting.	O	M	M

		▪ Upon opening sample cooler, visually inspect for signs of damaged bottleware and broken glass. Wear cut-resistant and nitrile gloves.			
	Back Injury, Strains, Sprains, Foot Injuries	▪ Observe proper lifting techniques – lift with legs, elbows in, and keep back straight. ▪ Team lift large/awkward loads. ▪ Use mechanical means to lift if the weight is awkward or the weight is greater than 50 pounds individually or 80 pounds for team lifting. ▪ Use mechanical devices (e.g., wagon, sled) to transport equipment and samples over long distances. ▪ Take breaks frequently and rotate staff. ▪ Keep equipment secure until needed. And avoid stacking Wear steel-toed boots.	S	M	L
Equipment Decontamination	Refer to AHA 004: Decontamination of Tools and Equipment		S	M	M
IDW Management	Refer to AHA 014: IDW Management and Sampling		S	M	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Modified Level D- Long pants, safety glasses, hard hat (when required), steel-toed boots, nitrile outer gloves, cut proof inner gloves, high visibility personal floatation device. Equipment: water quality meter, water sampling device (e.g., dipper sampler), sample bottleware, coolers, bags of ice. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system). Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate. Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Calibrate PID daily, and fire extinguisher monthly.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 012 Surface Water Sampling** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Roll-off or Conex Delivery	Overall Risk Assessment Code (RAC) (Use highest code)						**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**						
Project Number:	**Severity**	**Probability**					
Date Prepared: 1/20/2020, Revised 3-17-22		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by (Name): M. Colbert, Ed Ashton	Catastrophic	**E**	**E**	**H**	**H**	**M**	
	Critical	**E**	**H**	**H**	**M**	**L**	
Reviewed by (Name): Greg Ertel	Marginal	**H**	**M**	**M**	**L**	**L**	
Employer / GBU: Parsons	Negligible	**M**	**L**	**L**	**L**	**L**	

Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	**Hazards**	**Controls**	**P**	**S**	**RAC**
General/Work Area	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain Slips, Trips, and Falls	▪ Refer to AHA 001: General Site Activities	S	M	M
Motorized Equipment Operation	Equipment Maintenance	▪ The equipment must be maintained in a proper functioning condition. ▪ All motors must be shut off. Electrical, mechanical and hydraulic components locked when making repairs. ▪ Safety shut-off systems must be tested daily and not disabled. ▪ Bleed off pressure on hydraulic lines before undoing fittings. ▪ Do not leave tools or parts loose on equipment after maintenance has been performed.	U	Ca	M

	General Use	▪ All equipment must be inspected daily prior to use. ▪ Equipment must be operated and maintained in accordance to manufacture's guidelines. ▪ Any equipment that is unattended must be immobilized and secured against accidental movement. ▪ All heavy equipment will have a backing up alarm.	U	Cr	L
	Fire Hazard	▪ All motors must be shut off during refueling. ▪ An A-B-C fire extinguisher must be maintained on the equipment. ▪ A-B-C fire extinguishers must be inspected and functional. ▪ Fuel will be stored in UL approved safety containers with contents clearly labeled.	U	Cr	L
Roll Off or CONEX Container Deliveries	Operation of Motorized Equipment	▪ Operators of motorized equipment will be trained in the proper operation of that apparatus. ▪ All container deliveries will be completed by using at least one spotter. Roll off delivery drivers will have ground assistance at all time. ▪ Be sure that container is not frozen to the ground and free to move prior to loading	U	Ca	M
	Tip Over	▪ All nearby persons must steer clear of the container while it is being lowered/placed to prevent being crushed. ▪ The delivery site will be checked to ensure safe delivery/placement of the roll off container. ▪ The delivery location will be checked for any overhead utilities, tree limbs, signage, etc. that could come in contact with the roll off box during delivery.	U	Ca	M
	Struck By Pinch Points	▪ All personnel will be aware of moving machinery and parts and wear appropriate PPE when near machinery (e.g., hard had, safety glasses, etc.) ▪ Stay away from area fully clear of swing area and truck when hoisting	S	N	L
	Noise Exposure	▪ Hearing protection will be worn in hazardous noise areas or working around heavy machinery or equipment. ▪ Wear earplugs when noise level from equipment exceeds 90 decibels (dBA) averaged over an eight-hour day.	O	N	L

Equipment to be Used	**Training Requirements/Competent or Qualified Personnel name(s)**	**Inspection Requirements**
PPE (Level D) - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Calibrate PID daily, and fire extinguisher monthly.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 013 Roll-off or Conex Delivery** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: IDW Management and Sampling	Overall Risk Assessment Code (RAC) (Use highest code)					**H**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**					
Project Number:	**Severity**	**Probability**				
Date Prepared: 1/20/2020		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name): J. Mikochik	Catastrophic	**E**	**E**	**H**	**H**	**M**
	Critical	**E**	**H**	**H**	**M**	**L**
Reviewed by (Name): Greg Ertel	Marginal	**H**	**M**	**M**	**L**	**L**
Employer / GBU: Parsons	Negligible	**M**	**L**	**L**	**L**	**L**
Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**					
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				**RAC Chart**	
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				**E = Extremely High Risk** **H = High Risk**	
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				**M = Moderate Risk** **L = Low Risk**	

Job Steps	Hazards	Controls	P	S	RAC
General Activities/Work Zone	Working in Vicinity of Indoor/Outdoor Vehicle Traffic/Active Equipment Operation	▪ Keep out of travel paths of vehicles and roadways, where possible. ▪ Set up traffic cones and flagging to secure work area ▪ Wear Level D PPE and reflective safety vest ▪ Maintain eye contact/communication with facility and subcontractor's equipment/vehicle operators	S	Cr	M
	Slips, Trips, Falls	▪ Use designated walkways whenever possible ▪ Avoid or remove all trip hazards by keeping materials/objects organized and out of walkways. ▪ Keep work surfaces dry ▪ Practice good housekeeping and keep work areas free of debris ▪ When entering residential and commercial buildings, be extra viligant for hazards, particularly slipping hazards. Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Avoid, remove, communicate and mark (if possible) hazards.	S	Cr	M

		▪ Utilize adequate lighting ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself, and plan your route. ▪ Clean up all spills immediately, and dispose properly. ▪ Personnel will notify the SSO of any unsafe conditions.			
	Site Hazards Material Exposure	▪ Training and safety awareness of potential exposure to contaminates at the site. ▪ Training of all personnel decontamination procedures (if appropriate to visit). Provide adequate hygiene and decontamination supplies. ▪ Practice contamination avoidance, work upwind if feasible, limit contact to the extent possible, do not eat in areas with COC's, keep drink containers covered. ▪ Appropriate PPE will be worn dependent on-site conditions and actions levels. ▪ Monitoring breathing zone with PID and/or MultiRAE. ▪ Have support personnel remain upwind of the work area ▪ Keep Safety Data Sheets for chemicals on site ▪ Must sign off on health and safety plan. ▪ Keep all sampling supplies and bottles upwind or crosswind. ▪ Visitor will be escorted around site by an individual with current 40 hour HAZWOPER training, unless cleared with the SSO.	S	M	L
	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA-001:General Activities	S	M	M
Unloading, Loading, Movement, and Transport of Drums/Totes	Slips, Trips, and Falls	▪ Refer to general slips, trips, and falls hazards in General/Work Area job step above. ▪ Be aware of footing at all times. Clear areas of obstacles before moving through.	S	Cr	M
	Falling/Sliding Items	▪ Secure drums/totes in truck bed prior to transport, in particular, if empty. Position items in front of truck bed opposed to back, as braking hard could cause them to slide forward and crash into cab of truck. ▪ Wear proper PPE when lifting and moving empty drums and totes – hard hat, safet glasses, steel toed boots, and heavy work gloves.	S	Cr	M
	Hand Injury and Pinch Points	▪ Be aware of potential pinch points. ▪ Used thick gloves for all material handling.	S	M	L
	Foot Injury	▪ While moving and transporting drums/totes, keep feet clear of drums. ▪ Safety-toed boots should be worn when moving and transporting drums.	S	M	L

	Ergonomics/Back Strains	▪ Use mechanical means (hand carts, trucks) to lift if the weight is awkward or the weight is greater than 50 pounds individually or 80 pounds for team lifting. ▪ Where possible, avoid lifting drum or totes with filled contents. Transfer contents to staging area containers using sump/trans pump. ▪ Avoid performing the same strenuous activity for extended periods.	O	M	M
	Environmental Release	▪ Inspect Spill Kit supplies & locate spill kits prior to performing maintenance. ▪ Properly secure drums and totes during transport.	U	M	L
Opening, Closing, and Filling Drums/Totes (Solid or Liquid Contents)	Pinch Points/Hand Injury	▪ Be aware of potential pinch points. Use proper tools for opening/closing lids. ▪ Use thick work gloves.	U	M	L
	Liquid Spills and Splashes, Environmental Release	▪ Care will be taken that the liquid being placed in the drum does not spill onto the top of the drum or the ground. Use a drum funnel to assist in the task. Do not overfill the funnel. Secondary containment will be used for added protection, such as a spill pallet or plastic sheeting contained by berms. ▪ If a pump is used fill drum/tote, ensure that pump hosing is sufficient secured inside of tank or drum, using clamps where necessary. Do not turn on pump until hosing is secured into drum/tote. Turn off pump when not in use. ▪ Secondary containment will be used for added protection, such as a spill pallet or plastic sheeting contained by berms. ▪ Wear safety glasses when filling drums/totes.	U	M	L
	Electrical Hazards	▪ Inspect extension cords for equipment prior to use. Check for any frays in the wire. Damaged cords should be taken out of service. ▪ If a car or marine battery is used as electrical source for pump, check for signs of corrosion. Attach and tighten each cable one at a time (posited/red first, black/negative second). Avoid placing near water.	U	Ca	M
	Ergonomics/Back Strains, Eye Injury	▪ Personnel will use caution when shoveling dirt into a drum to avoid spraying rocks or dirt. If possible, only one worker will fill a drum at a time and take turns shoveling. ▪ Wear safety glasses when filling drums/totes.	U	M	L
	Site Hazards Material Exposure/Vapors	▪ Wear appropriate PPE when opening drums (nitrile and work gloves, steel toed boots, safety glasses, hard hat). ▪ Screen headspace below drum/tote lid or cover with PID and/or MultiRAE upon opening to assess for the presence of strong vapors. Upon opening lid and filling contents, continuously monitoring breathing zone with PID and/or MultiRAE.	S	M	L
Oversee Delivery/Pick-up of Frac Tank	Refer to AHA 014: Roll-off Delivery		S	M	M
Transfer Liquid Waste to Frac Tank via Sump	▪ Pinch Points, Hand Injury, and Moving Parts	▪ Be aware of potential pinch points. Use proper tools for opening/closing drum/tote lids and for opening frac tank hatch.	U	Cr	M

Pump, Frac Tank Hatch Access		▪ Use thick work gloves when handling drums, totes, pump/hosing, generator, and when opening/closing hatch for frac tank.			
	▪ Electrical Hazards	▪ Inspect extension cords for equipment prior to use. Check for any frays in the wire. Damaged cords should be taken out of service. ▪ If a car or marine battery is used as electrical source for pump, check for signs of corrosion. Attach and tighten each cable one at a time (posited/red first, black/negative second). Avoid placing near water.	U	Ca	M
	▪ Refueling – Fire/Explosion Hazards, Environmental Release	▪ A Type ABC, 20-lb, fully charged fire extinguisher will be in an accessible area on-site. ▪ Prohibit storage of fuel in plastic containers. Store fuel can and generator in well ventilated areas and keep away from combustible materials and heat sources. Keep fuel can and generator in secure area when not in use and properly secure during transport. ▪ Turn off generator before refueling. ▪ No smoking while onsite and when refueling. ▪ Have spill absorbent pads nearby to prevent the spread of spilled materials. ▪ Inspect safety gas can for defects (e.g., lid doesn't completely close) before usage, refilling, and during transport. ▪ Conduct refueling activities in flat areas with impervious surfaces (concrete, asphalt, etc) and away from bare ground, surface water, and catch basins.	S	Cr	M
	▪ Ergonomics/Back Strains	▪ Use mechanical means (hand carts, trucks) to lift equipment if the weight is awkward or the weight is greater than 50 pounds individually or 80 pounds for team lifting. ▪ Avoid performing the same strenuous activity for extended periods.	U	M	L
	▪ Splash Hazards, Environmental Release	▪ Ensure that pump hosing is sufficient secured inside of frac tank, using clamps where necessary and hatch lid to secure. Do not turn on pump until hosing is secured. Turn off pump when not in use. ▪ Secondary containment will be used for added protection, such as a spill pallet or plastic sheeting contained by berms. ▪ Wear safety glasses during pumping operations	U	M	L
	▪ Slips, Trips, and Falls	▪ Refer to control measures listed above in General/Work Area job steps for general slips, trips, and falls. ▪ Be aware of location of hosing at all times. Mark with cones. ▪ Keep work surfaces dry when possible or wear non-slip rubber boots. ▪ Be aware of uneven footing. ▪ Maintain 3 points of contact when walking up/down stairs to access top of frac tank. Only rent frac tank that is equipped with sufficient hand rails on stairs and on top.	U	Ca	M
	▪ Site Hazards Material Exposure/Vapors	▪ Wear appropriate PPE when opening drums (nitrile and work gloves, steel toed boots, safety glasses, hard hat) and when opening frac tank hatch. ▪ Screen headspace of drum/tote and below hatch of frac tank before fully opening with PID and MultiRAE upon opening to assess for the presence of strong vapors or hazardous atmospheres.	O	M	M

		Continuously monitoring breathing zone with PID and MultiRAE during waste transfer process. ▪ If possible, position bodt upwind of hatch opening.			
Waste Characterization Sampling (Drums, Totes, and/or Frac Tank)	▪ Site Hazards Material Exposure/Vapors	▪ Wear appropriate PPE when opening drums (nitrile and work gloves, steel toed boots, safety glasses, hard hat) and when opening frac tank hatch. ▪ Screen headspace of drum/tote and below hatch of frac tank before fully opening with PID and/or MultiRAE upon opening to assess for the presence of strong vapors or hazardous atmospheres. Continuously monitoring breathing zone with PID and/or MultiRAE during sampling activities and when drums/tote/frac tank are open. ▪ If possible, position body upwind of drum, tote, or frac tank hatch.	O	M	M
	▪ Pinch Points and Cuts from Glassware, Exposure to Preservatives	▪ Wear appropriate gloves (nitrile and cut-resistant gloves) and safety glasses when opening cooler and when handling bottlewear that is either glass, or contains preservatives. ▪ Visually inspect cooler upon opening and while packaging for signs of damaged bottleware and broken glass. ▪	O	M	M
	▪ Slips, Trips, and Falls	▪ Refer to control measures listed above in General/Work Area job steps for general slips, trips, and falls. ▪ Position bottleware, coolers, and sampling apparatus so as not to create a trip hazard. ▪ Keep work surfaces dry when possible or wear non-slip rubber boots. ▪ Be aware of uneven footing. ▪ Maintain 3 points of contact when walking up/down stairs to access top of frac tank. Only rent frac tank that is equipped with sufficient hand rails on stairs and on top.	S	Ca	H
	▪ Splash Hazards, Environmental Release	▪ Secondary containment will be used for added protection, such as a spill pallet or plastic sheeting contained by berms. ▪ Wear safety glasses and nitrile gloves. ▪ Inspect Spill Kit supplies & locate spill kits prior to performing maintenance. ▪ Secure and close drums/totes when not in use.	U	M	L
Oversight of Pick-up/Transportation of Filled Drums and Totes	▪ Pinch Points, Hand Injury	▪ Be aware of potential pinch points. ▪ Used thick gloves for all opening and closing drums.	S	M	L
	▪ Ergonomics/Back Strains	▪ Do not attempt to move drums unless with appropriate mechanical means (e.g., drum dolly). ▪ Do not attempt to lift drums into truck manually. Subcontractor shall provide lift gate on truck.	S	M	L
	▪ Vehicle and heavy equipment traffic in work area	▪ Be mindful of surroundings. ▪ Keep out of travel paths of vehicles and roadways, where possible. ▪ Set up traffic cones and flagging to secure work area ▪ Wear Level D PPE and reflective safety vest ▪ Maintain eye contact/communication with facility and subcontractor's equipment/vehicle operators	S	Cr	M
Oversight of Vac Truck Operations (Removal	▪ Vehicle and heavy equipment traffic in	▪ Be mindful of surroundings. ▪ Keep out of travel paths of vehicles and roadways, where possible.	S	Cr	M

of Frac Tank Contents)	work area	▪ Set up traffic cones and flagging to secure work area ▪ Wear Level D PPE and reflective safety vest ▪ Use a spotter. Have one person conduct ground assistance at all times. ▪ Maintain eye contact/communication with facility and subcontractor's equipment/vehicle operators			
	▪ Noise	▪ Hearing protection will be worn in hazardous noise areas or working around heavy machinery or equipment. ▪ Wear earplugs when noise level from equipment exceeds 90 decibels (dBA) averaged over an eight-hour day.	S	M	L
	▪ Slips, Trips, and Falls	▪ Refer to control measures listed above in General/Work Area job steps for general slips, trips, and falls. ▪ Be aware of location of hosing at all times. Mark with cones. ▪ Keep work surfaces dry when possible or wear non-slip rubber boots. ▪ Be aware of uneven footing. ▪ If access to top of frac tank needed, maintain 3 points of contact when walking up/down stairs to access top of frac tank. Only rent frac tank that is equipped with sufficient hand rails on stairs and on top.	U	Ca	M
	▪ Pressure Bursts / Struck By	▪ Beware of joints and weak points in the hose during pump operations. Avoid stepping over hose as much as possible. If burst were to occur, stay away from the breach in the hose and turn off pump immediately. ▪ Check that all mechanical hose connections are secure. Make sure all manual connections are "positive locked" and have safety cables (otherwise known as chokers, hose anchors or whip checks) properly attached. Slowly open valves. ▪ Wear proper PPE – safety glasses, hard hat, and steel-toed boots. ▪ Ensure individuals are trained on the proper operation of the vac truck equipment.	S	Cr	M
	▪ Environmental Release, Splash Hazards ▪ Compliance with DOT Shipping regulations	▪ Secondary containment will be used for added protection, such as a spill pallet or plastic sheeting contained by berms. ▪ Wear safety glasses and nitrile gloves. ▪ Inspect Spill Kit supplies & locate spill kits prior to performing activities. ▪ Inspect hoses prior to use for signs of ▪ Assess material to ensure it does not meet hazardous material shipping requirements, if designated as HAZMAT use a trained and authorized shipper with proper paperwork and approved shipper	U	M	L
	▪ Site Hazards Material Exposure/Vapors	▪ Wear appropriate PPE (nitrile and work gloves, steel toed boots, safety glasses, hard hat) during oversight ▪ Continuously monitoring breathing zone with PID and/or MultiRAE during vac truck operations . ▪ If possible, position body upwind of work zone.	O	M	M
Oversight of Frac Tank Clean-Out	▪ Use of Pressure Washer – Slips, Trips, Fall, Eye-	▪ Ensure individuals are trained on the proper operation of the pressure washer and understand hazards associated with the pressurized equipment.	S	Cr	M

	Face Injuries	▪ Keep out of line of fire of pressure washer. Make sure that all workers and bystanders are cleared from area before operating. ▪ Workers shall wear proper PPE (safety glasses with side shields + a face shield) ▪ Turn off valves when not in use. ▪ Be aware of location of hosing at all times. Mark with cones. ▪ Keep work surface area dry and wear slip resistant boots.			
	▪ Site Hazards Material Exposure/Vapors, Confinsed Space	▪ Make sure workers are properly trained with the task and are aware of site chemical hazards in advance of the work. Workers entering into frac tank shall possess HAZWOPER and confined space training. Subcontractor shall complete necessary confined space paperwork and supply to Parsons in advance. Parsons shall document that confined space entry procedures are being followed by subcontractor (presence of attendant, proper PPE, decontamination procedures, air monitoring, etc). ▪ Practice contamination avoidance. Have support personnel remain upwind of the work area ▪ Wear Level D PPE. Workers completing the cleanout may require more stringent PPE. ▪ Monitoring breathing zone with PID and/or MultiRAE. Workers completing the cleanout shall also complete monitoring while inside of tank.	S	Cr	M
Equipment Decontamination	Refer to AHA 004: Decontamination of Tools and Equipment		S	M	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent. Level D PPE - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Inspect drugs and totes for any signs of bulging daily. Inspect conditions of frac tank (rails and steps) Take 5 Card when appropriate Get Out and Look (GOAL)

	necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Equipment inspection as necessary, recorded in field book. Complete daily calibration of PID, weekly calibration of Multi-gas meter, and monthly inspection of fire extinguishers.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 014 IDW Management and Sampling** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

NAME	SIGNATURE	COMPANY	DATE	CRAFT	TRAINER	TRAINER SIGNATURE
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Activity/Work Task: Access to Residential Properties	Overall Risk Assessment Code (RAC) (Use highest code)						M
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**						
Project Number:	**Severity**	**Probability**					
Date Prepared: 1/20/2020		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by (Name): J. Mikochik	Catastrophic	E	E	H	H	M	
	Critical	E	H	H	M	L	
Reviewed by (Name): Greg Ertel	Marginal	H	M	M	L	L	
Employer / GBU: Parsons	Negligible	M	L	L	L	L	

Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	Hazards	Controls	P	S	RAC
General Activities - Exterior	Vehicle Traffic	▪ Keep out of travel paths of vehicles and roadways/driveways, where possible. Refer to AHA 002: Operation of Motor Vehicle ▪ Set up traffic cones and flagging to secure work area ▪ Wear Level D PPE and reflective safety vest ▪ Maintain eye contact/communication with facility equipment/vehicle operators	S	Cr	M
	Theft of Equipment/Vehicles	▪ Do not leave any equipment or personal items unattended. ▪ Ensure that vehicle is locked and values removed to the extent practical. ▪ Be aware of surrounding and keep lookout. ▪ Alert authorities of suspicious activities.	U	M	L

	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	S	M	M
Building and Property Entry/Access	Slips, Trips and Falls	▪ Be aware of slippery surface and potential trip hazards. ▪ Politely ask tenants if obstructions/trip hazards can be removed from walkways. ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Clean up all spills immediately and dispose properly. ▪ Utilize proper illuminating. Never walk in low-lit areas. ▪ Wear appropriate PPE including non-slip steel toe rubber boots when working on wet or slick surfaces. Do not carry more than 50 lbs by yourself	O	M	M
	Ergonomics	▪ Do not lift/carry objects heavier the 50 lbs without assistance or use a mechanical means (e.g., dolly cart) ▪ Avoid twisting and maintain the load close to the body as practical ▪ Bend at the knees, rather than waist	O	M	M
	Attack from Pets	▪ **Pre-entry procedures** (complete before mobilization to property): o Contact property owner to ask if they have pets and are willing to secure in separate room (or inside, if work is being completed outside) during exterior/interior walkthrough and sampling activities. ▪ **Post-Entry Procedures** (Upon entering property): o Verify pets are secured. Wait until they are secured, or don't enter house (re-schedule if necessary).	O	M	M
	General Security	▪ **Pre-entry procedures** (complete before mobilization to property): o Compare property owner/tenant names to state sex offender registry. o Contact property owner to explain the building walkthrough/sampling procedures. o Notify local police department and non-emergency 911 center in advance of work to explain activities which will be taking place and timeframe of activities. o Establish sufficient support team (buddy system and office support staff). Establish standard procedures for resident entry and communication (exchange company cellphone numbers with team).	O	M	M

		▪ **Entry Procedures** (At Door): o Use the buddy system, or teams of three if possible. o Carry Alert GPS FOB, and active GPS tracking applications on phones. o Introduce yourself and request access to performed scheduled activities on property. If activities are unscheduled, present/reference letter sent to them (or owner), contractor introduction letter, and present them with the offer to conduct the desired activities (e.g., sampling) on behalf of NYSDEC/NYSDOH. Leave premise if owner/tenant does not desire that you enter premise. o Notify office support staff via text upon entering building (e.g., Entering ### Main Street). o Enter house and don disposable boot covers. o Carefully explain the proposed activities (e.g., sampling, building walkthrough) and staff placement: ▪ One employee at sample point (if applicable) ▪ One employee between sample point and stairs (if in basement) or nearest exit ▪ Line of sight between employees to be maintained at all times. ▪ One person is vehicle as back up o Employees communicate with each other via text message or walkie talkie to “check-in”. o Exit house upon completing activities. Notify office support staff via text. ▪ **Actions to Avoid**: o Do not enter private rooms or rooms not necessary to perform work. o Do not use resident’s bathroom facility, phone service, or any tools, materials, related items. o Do not provide or receive of food, beverage, or any gift. ▪ **No Entry/Abort Conditions**: o Unleashed dogs/pets or owner unwilling to put pet in secure location. o Evidence of illegal drug use. o Human waste or excrement observed. o Resident desires to leave or is not present (interior activities only) o Any sense of danger or threat (verbal, physical gestures, etc). o Resident does not desire you to enter premise. o Inappropriate comments. o Posted, no trespassing sign.			

	Theft of Equipment/Vehicles	▪ Do not leave any equipment or personal items unattended. ▪ Ensure that vehicle is locked and valuables removed to the extent practical. ▪ Be aware of surroundings and keep lookout. ▪ Have copies of emergency contacts readily available or stored in phone in the event of theft. ▪ Alert authorities of suspicious activities.	U	M	L

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent. Level D PPE - Long pants, safety glasses, high-visibility vest/clothing, steel-toed boots, gloves, safety glasses.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 015 Access to Residential Properties** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Soil Vapor Installation and Air Sampling	Overall Risk Assessment Code (RAC) (Use highest code)						**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**						
Project Number:	**Severity**	**Probability**					
Date Prepared: 1/16/2020, Revised 3-17-22		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by (Name): M. Colbert, J. Mikochik, Ed Ashton	Catastrophic	E	E	H	H	M	
	Critical	E	H	H	M	L	
Reviewed by (Name): Greg Ertel	Marginal	H	M	M	L	L	
Employer / GBU: Parsons	Negligible	M	L	L	L	L	
Notes: (Field Notes, Review Comments, etc.) **References:** Buddy system when entering residential/commercial buildings and PSHEP, EHSARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**						
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				**RAC Chart**		
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				**E = Extremely High Risk** **H = High Risk**		
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				**M = Moderate Risk** **L = Low Risk**		

Job Steps	Hazards	Controls	P	S	RAC
Mobilize to sampling location, general activities	General Access and Security	▪ Refer to AHA 015: Access to Residential Properties and AHA 01 Field Activities	S	M	M
	Theft of Equipment/Vehicles	▪ Do not leave any equipment or personal items unattended. ▪ Ensure that vehicle is locked and valuables removed to the extent practical. ▪ Be aware of surrounding and keep lookout. ▪ Alert authorities of suspicious activities.	U	M	L
	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	S	M	**M**

	Motion – Slips, Trips, Falls over debris, work materials, uneven ground surface, stairways	▪ Use designated walkways whenever possible ▪ Avoid or remove all trip hazards by keeping materials/objects organized and out of walkways. ▪ Keep work surfaces dry ▪ Practice good housekeeping and keep work areas free of debris ▪ When entering residential and commercial buildings, be extra viligant for hazards, particularly slipping hazards. Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Avoid, remove, communicate and mark (if possible) hazards. ▪ Utilize adequate lighting ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself, and plan your route. ▪ Clean up all spills immediately, and dispose properly. ▪ Personnel will notify the SSO of any unsafe conditions.	S	Cr	M
	Sprains/strain to back, shoulders and legs from lifting and carrying supplies/equipment	▪ Do not lift/carry objects heavier than 50 lbs without assistance or use a mechanical means (e.g., dolly cart) ▪ Avoid twisting and maintain the load close to the body as practical ▪ Bend at the knees, rather than waist	O	M	M
	Working in Vicinity of Indoor/Outdoor Vehicle Traffic/Active Equipment Operation	▪ Keep out of travel paths of vehicles and roadways, where possible. ▪ Set up traffic cones and flagging to secure work area ▪ Wear Level D PPE and reflective safety vest ▪ Maintain eye contact/communication with facility equipment/vehicle operators. ▪ Refer to AHA 018: Traffic Management.	S	Cr	M
	Chemical – vapors	▪ Monitor area for %O2, %LEL, H2S, CO & VOCs prior to and during work as specified in the PSHEP. ▪ Review to action levels in PSHEP.	S	Cr	M

	Confined Space	▪ Monitor air when in vicinity of confined spaces or near potential hazardous atmospheres for %O2, %LEL, H2S, CO, & VOCs prior to and during work as specified in the PSHEP. ▪ Always use the buddy system. ▪ Be aware of locations of any confined spaces present inside of the facility buiding(s). Consult with knowleagable facility personnel. ▪ Do not enter a confined space unless given a Parsons confined space entry Permit. ▪ Practice safe confined space entry procedure as specified in PSHEP and Confined Space Activity Hazard Analysis.	U	Ca	M
Use of Slide Hammer or Hand Drill to Install Soil Vapor or Sub-Slab Points	Motion – Contact with Utilities	▪ Verify underground features have been marked and points are 5’ or greater from identified features or variance is approved and onsite ▪ Ensure that DigSafe is notification has been completed and utilities are marked-out ▪ Check site blueprints/drawings and contact knowledgeable personnel to verify locations of additional on-site utilities and subsurface conduits. ▪ Have emergency telephone number available	S	M	L
	Motion – Ergonomic Hazards	▪ Take breaks often and switch personnel ▪ Reduce bending, twisting, and kneeling, by using alternating work, rotating workers and periodic stretching break to reduce static or awkward postures. ▪ Use team lifting and lifting aids for objects > 50 lbs. ▪ Use kneeling pad when necessary to kneel around work area	O	M	M
	Mechanical – pinch points and cuts	▪ Wear thick work gloves when using hand/power tools. ▪ Watch hand placement and keep hands out of the line of fire to avoid pinching/smashing. Avoid raising the slide hammer higher than the top of the pole – use smooth controlled motion with slide hammer. ▪ Keep hands away from sample point when using drill. ▪ Rotate task, take breaks as needed. ▪ Hand tools will be inspected, tested, and determined to be in safe operating condition before use. Any damaged equipment will be taken out of service. ▪ Ensure power tools are equipped with gaurds and are operational. ▪ Avoid loose clothing, loose gloves, jewelry, and tie-back long hair. ▪ Hand tools will be in good repair and with all required safety devices installed and properly adjusted.	S	Cr	M

	High Noise Levels	▪ Use hearing protection when exposed to excessive noise levels (greater than 85 dBA), and double hearing protection if noise levels are greater than 90 dBA. Hearing conservation program in place. Hearing Protection – Ear Plugs, either in custom molded, formable, and pre-molded or ear muffs.	L	M	M
	Electrical	▪ Use a GFCI in-line cable or extension cord when using the drill ▪ Ensure area is free of standing water and work is completed greater than 5 feet away from water. Inspect walls and floors for cracks. ▪ Inspect extension cords prior to use. Check for any frays in the wire and that all 3 prongs are intact. Damaged cords should be taken out of service.	U	Ca	M
	Chemical – vapors, silica dust	▪ Don proper skin, eye (facemask and safety glasses), and respiratory protection (as needed) based on the exposure hazards. ▪ Review hazardous associated with silica dust exposure ▪ Minimize dust by use of spray mister while drilling through concrete or sweeping up concrete dust. ▪ Use multi-gas meter to monitor work area, and use Stop Work Authority (SWA) if air readings exceed limits listed on page 20 of the PSHEP	S	Cr	M
	Eye/Foot and Hand Hazards	▪ Eye/Face Protection – Safety glasses with side shields (ANZI Z87.1) ▪ For significant flying object hazard, use full face shield ▪ Appropriate safety toed footwear is required ▪ Use sturdy leather work, or specialty gloves as required	S	Cr	M
Conduct Helium Tracer Test	Transport, Movement, and Use of Compressed Gasses	▪ Properly secure canisters within vehicle when transporting. ▪ Inspect canisters for signs of leaks and corrosion. ▪ Carefully transport canister to sampling area. ▪ Keep canisters away from ignition or heat sources. ▪ Detach regulator from canister when not in use. ▪ Slowly open values during operation.	S	Cr	M
	Motion – Manual Handling of tools, sand/bentonite bags, helium tank	▪ Compliance with manual lifting – Team lift if item is >50 lbs.	O	M	M
	Motion – kneeling in work area	▪ Use kneeling pad when necessary to kneel around work area	O	M	M
Set soil vapor or sub-slab point into ground	Chemical – vapors/dust from bentonite/sand	▪ Wear nitrile gloves when handling media. ▪ Use multi-gas meter to monitor work area, and use SWA if air readings exceed limits listed in PSHEP	S	Cr	M

		▪ Stand upwind when mixing grout			
	Mechanical – Pinch Points and Cuts	▪ Position hand/fingers out of line of fire to avoid pinching/smashing/crushing when handling equipment ▪ Wear appropriate work gloves/cut resistant gloves depending on task	S	M	L
	Motion – Manual Handling of tools, sand/bentonite bags	▪ Compliance with manual lifting – Team lift if item is >50 lbs. ▪ Clear area of all unnecessary equipment and slip/trip hazards ▪ Use kneeling pad if kneeling around work location	O	M	M
Collect soil vapor or air sample with Summa canister	Mechanical – pinch points/hand tools	▪ Watch hand placement on tools and equipment/canister	S	M	L
	Chemical – vapors	▪ Wear nitrile gloves at all times to protect against dermal contact with potentially contaminated samples. ▪ Use multi-gas meter to monitor work area, and use SWA if air readings exceed limits listed in PSHEP	S	Cr	M
	Motion – kneeling in work area	▪ Use kneeling pad when necessary to kneel around work area	O	M	M
Backfill/Grout Locations	Chemical – vapors, silica dust	▪ Don proper skin, eye (facemask and safety glasses), and respiratory protection (as needed) based on the exposure hazards. ▪ Review hazardous associated with silica dust exposure ▪ Minimize dust by use of spray mister while drilling through concrete or sweeping up concrete dust when mixing concrete. ▪ Stand upwind when mixing grout/concrete	O	M	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing. CEMC minimum required PPE (Long Sleeved Shirt and Pants, Class IIA Safety Vest, Hard Hat, Z87 Safety Glasses, Hi Vis Gloves, Steel toed boots), First Aid Kit, Fire Extinguisher, Cut resistant gloves, facemask, Nitrile gloves, Muli-gas Meter, PID, Spill Kit, Slide Hammer, Soil Vapor Point Kit, Hand Tools, Summa Canisters, Helium cylinder	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	▪ Weekly Multi-gas Meter Calibration ▪ Daily PID Calibraiton ▪ Monthly fire extinguisher inspections ▪ Get Out and Look (GOAL) ▪ NY Public Utility Markout (OneCall)

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 016 Soil Vapor Installation and Air Sampling** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company and safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity Hazard Analysis (AHA) 017

Activity/Work Task: Site Surveying	Overall Risk Assessment Code (RAC) (Use highest code)					**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**					
Project Number:	**Severity**	**Probability**				
Date Prepared: 1/20/2020		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name): J. Mikochik	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name): Greg Ertel	Marginal	H	M	M	L	L
Employer / GBU: Parsons	Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.)
References:
PSHEP, ESHARP Manual, DASH Cards

Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above).
The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.

	RAC Chart
"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	
"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	**Hazards**	**Controls**	**P**	**S**	**RAC**
Perform Survey	Pinch Points/Cuts	▪ Be aware of hands/fingers while setting up tripods. Be aware of pinch point locations. Wear leather gloves when handling equipment/supplies. Watch hand position when opening/closing hinged lids/gates (i.e. tailgates, utility boxes, doors, etc.).	S	M	L
	Ergonomics	▪ Use proper lifting techniques. Use buddy lift when weight of object exceeds 49 lbs or is difficult to handle.	S	M	L
	Working in Vicinity of Indoor/Outdoor Vehicle Traffic/Active Equipment Operation	▪ Keep out of travel paths of vehicles and roadways, where possible. ▪ Set up traffic cones and flagging to secure work area ▪ Wear Level D PPE and reflective safety vest ▪ Maintain eye contact/communication with facility equipment/vehicle operators. ▪ Refer to AHA 018: Traffic Management.	S	Cr	M
	lips, Trips, and Falls	▪ Use designated walkways whenever possible ▪ Avoid or remove all trip hazards by keeping materials/objects organized and out of	S	Cr	M

		walkways. ▪ Keep work surfaces dry ▪ Practice good housekeeping and keep work areas free of debris ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Avoid, remove, communicate and mark (if possible) hazards. ▪ Work in adequate illumination. ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself and plan your route. ▪ Clean up all spills immediately and dispose properly. ▪ Personnel will notify the SSO of any unsafe conditions.			
	Heat/Cold Stress Biological Hazards Adverse Weather Uneven/Wet Terrain	▪ Refer to AHA 001: General Site Activities	S	M	M
	Marking Locations - Inhalation of spray paint fumes	▪ Utilize spray paint extension wand and spray marking paint downwind of your location. Wear nitrile gloves to avoid dermal contact and safety glasses.	S	M	L
	Motion – Struck by Hammer	▪ Ensure hammer head is secure on handle. Ensure other personnel are not in swing path or in location where they could be struck by hammer.	S	M	L
	Mechanical – Hand injury while installing survey stakes	▪ Be aware of hand/finger locations when driving stakes. Wear leather palmed gloves while driving stakes. Consider using an extension tool to hold stake while driving so hands are not in an at-risk location.	S	M	L

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent. Level D PPE - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Inspect that signage is set up appropriately and visible for all vehicles passing the work area. Take 5 Card when appropriate Get Out and Look (GOAL)

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 017 Site Surveying** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Traffic Management	Overall Risk Assessment Code (RAC) (Use highest code)					**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**					
Project Number:	**Severity**	**Probability**				
Date Prepared: 1/20/2020		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name): J. Mikochik	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name): Greg Ertel	Marginal	H	M	M	L	L
Employer / GBU: Parsons	Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	Hazards	Controls	P	S	RAC
Mobilization to Site, Vehicle Placement, and Vehicle Exit	Struck By	▪ Inspect vehicle prior to starting trip and complete Parsons Fleet Driver training if using leased vehicles. ▪ Make sure all signs and cones are loaded onto the truck before leaving for the jobsite. All personnel will wear high visibility vest or clothes. ▪ Upon arrival at the jobsite, park away from moving traffic. Whenever feasible place a barrier vehicle or a shadow vehicle between moving traffic and workers. ▪ Exit the vehicle carefully. Look both ways for oncoming traffic before opening door. Look before entering any right of ways.	S	Cr	M
Set up Traffic Control Measures and Begin Field Activities	Struck By	▪ Identify your work area and assess for moving traffic hazards. Conduct work at the maximum space possible between moving traffic and work area. ▪ Place safety cones and barricades around work area prior to beginning field activities. ▪ Facing moving traffic whenever feasible.	S	Cr	M

		▪ Move deliberately – do not make sudden moves that might confuse a motorist and cause an accident. ▪ Signal cautiously – whenever possible use radio communication. Carefully and deliberately use hand signals so they will not startle or confuse motorists or be mistaken for a flagger's directions. ▪ Avoid interrupting traffic flow – minimize crossing traffic lanes and never attempt to run across traffic lanes. ▪ If speed of traffic or traffic patterns or road patterns create a safety problem or make you nervous, "STOP WORK" and contact the Project Manager or Field Team Leader immediately			

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent. Level D PPE - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Inspect that signage is set up appropriately and visible for all vehicles passing the work area. Take 5 Card when appropriate

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 018 Traffic Management** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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	Slips, Trips, Falls	▪ Workers will be aware of potentially slippery surfaces and tripping hazards. ▪ Wear personal floatation device when working on or near water. ▪ Wear footwear that has sufficient traction to reduce risk of slipping. ▪ Workers will keep all areas clean and free of debris to deter any unnecessary trips and falls. ▪ Clean up all spills immediately. ▪ Be aware of obstacles on deck. ▪ Proceed carefully on floating docks and ramps. ▪ Use designated walkways whenever possible ▪ Avoid or remove all trip hazards by keeping materials/objects organized and out of walkways. ▪ Keep work surfaces dry ▪ Practice good housekeeping and keep work areas free of debris ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Avoid, remove, communicate and mark (if possible) hazards. ▪ Utilize adequate lighting ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself and plan your route. ▪ Clean up all spills immediately and dispose properly. ▪ Personnel will notify the SSO of any unsafe conditions.	S	M	M
	Muscle strain/injuries from improper lifting	▪ Personnel will utilize proper lifting techniques or ask for assistance with moving/lifting objects. ▪ Observe proper lifting techniques – lift with legs, elbows in, and keep back straight. ▪ Team lift large/awkward loads. ▪ Use mechanical means to lift if the weight is awkward or the weight is greater than 50 pounds individually or 80 pounds for team lifting. ▪ Use mechanical devices (e.g., wagon, sled) to transport equipment and samples over long distances. ▪ Take breaks frequently and rotate staff. ▪ Keep equipment secure until needed. And avoid stacking Wear steel-toed boots.	S	M	M
	Marine Operation Hazards	▪ Verify that water craft operator has operator certifications. ▪ Make sure not to overload boat. Do not exceed maximum weight limit for water craft. ▪ Wear a exposure suit, dry suit, or insulated neoprene wet suit when the combined air and water temperature is below 85 degrees ▪ Follow all posted waterway speed limits.	S	M	M

		▪ Operator will be aware of all buoys, shoal markers and other indications of potentially dangerous locations. ▪ Vessel will be equipped with all USCG and project required safety equipment. (flares, flags, fire extinguisher)			
Unloading equipment	Slip, Trips and Falls	▪ Secure boat. ▪ Step carefully off boat. ▪ Use rails or assistance from someone on the dock. ▪ Avoid carrying anything off the boat. ▪ Use designated walkways whenever possible ▪ Avoid or remove all trip hazards by keeping materials/objects organized and out of walkways. ▪ Keep work surfaces dry ▪ Practice good housekeeping and keep work areas free of debris ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Avoid, remove, communicate and mark (if possible) hazards. ▪ Utilize adequate lighting ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself and plan your route. ▪ Clean up all spills immediately and dispose properly. ▪ Personnel will notify the SSO of any unsafe conditions.	S	M	M
	Muscle strain/injuries from improper lifting	▪ Load items off from the boat or have someone hand them to you one by one. ▪ Personnel will utilize proper lifting techniques or ask for assistance with moving/lifting objects. ▪ Observe proper lifting techniques – lift with legs, elbows in, and keep back straight. ▪ Team lift large/awkward loads. ▪ Use mechanical means to lift if the weight is awkward or the weight is greater than 50 pounds individually or 80 pounds for team lifting. ▪ Use mechanical devices (e.g., wagon, sled) to transport equipment and samples over long distances. ▪ Take breaks frequently and rotate staff. ▪ Keep equipment secure until needed. And avoid stacking Wear steel-toed boots.	S	M	M
	Fatigue	▪ Do not let fatigue or tiredness associated with the day's activity compromise attention to proper health and safety. ▪ Get adequate rest, if you are not Fit for Duty, use Stop Work authority	S	M	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Modified Level D- Long pants, safety glasses, hard hat (when required), steel-toed boots, nitrile outer gloves, cut proof inner gloves, high visibility personal floatation device. Equipment: water quality meter, water sampling device (e.g., dipper sampler), sample bottleware, coolers, bags of ice. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system). Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate. Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Calibrate PID daily, and fire extinguisher monthly.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 019 Activities-Barge or Boat** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Operation-of Barge or Boat	Overall Risk Assessment Code (RAC) (Use highest code)							**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**							
Project Number:	**Severity**	**Probability**						
Date Prepared: 4/15/2020, Revised 3-17-22		Frequent	Likely	Occasional	Seldom	Unlikely		
Prepared by (Name): Sara Weishaupt, Ed Ashton	Catastrophic	**E**	**E**	**H**	**H**	**M**		
	Critical	**E**	**H**	**H**	**M**	**L**		
Reviewed by (Name): Greg Ertel	Marginal		**M**	**M**	**L**	**L**		
Employer / GBU: Parsons	Negligible	**M**	**L**	**L**	**L**	**L**		

Notes: (Field Notes, Review Comments, etc.)
References:
PSHEP, ESHARP Manual, DASH Card

Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above).
The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Job Steps	**Hazards**	**Controls**	**P**	**S**	**RAC**
Boarding and Deboarding Boat	Slips, Trips, and Falls	▪ Use proper footing and handrails for boarding and deboarding of boat. Be aware of any objects on the boat and dock that may present a tripping hazard. ▪ Assure that boat is firmly grounded before attempting to exit boat. Assure ground is firm before stepping out of boat. ▪ Check for wet or icy surfaces before stepping into or out of boat. ▪ Maintain three points of contact when boarding or deboarding boat. ▪ Do not board or deboard boat while carrying a load. Always transfer loads from barge or boat. Do not exceed rated load capacity of the boat, place load so boat remains levels and oriented properly ▪ Always place foot on flat, stable surfaces when boarding or deboarding. Step to center of boat when entering Never step on sidewalls.	S	M	M

Man Overboard		▪ If a person falls in the water, use flotation device and retrieval rope to assist the person. Once onboard, move person to shore immediately and allow to dry off and warm up. Stand by to assist the victim and observe for signs of hypothermia. ▪ If air temperature is below 50 deg F and water temperature is below 50 deg F, either don survival suits or conduct activities close to shore where victim can easily be transported to support area within 15 minutes. Steps, ladder or other retrieval device must be readily available	S	M	M
Navigate	Boat traffic and obstructions	▪ Check weather forecast and monitor throughout trip. Reschedule trip if severe weather is forecast, monitor USCG advisories ▪ Maintain a safe operating distance from shoreline, other vessels, shallow water, obstructions, etc. ▪ Operator must have USCG Boating Course or equivalent training. For Commercial Boats, license as per USCG requirements ▪ Complete and file Float Plan as needed for work on navigable water ways ▪ Establish call-in system at set-times	S	M	M
	Marine Operation Hazards	▪ Follow all posted waterway speed limits. ▪ Operator will be aware of all buoys, shoal markers and other indications of potentially dangerous locations. ▪ Vessel will be equipped with all USCG and project required safety equipment. (flares, flags, fire extinguisher) ▪ Verify that water craft operator has operator certifications. ▪ Make sure not to overload boat. Do not exceed maximum weight limit for water craft. ▪ Wear a exposure suit, dry suit, or insulated neoprene wet suit when the combined air and water temperature is below 85 degrees	S	M	M
	Anchor Lights	▪ Power-driven vessels and sailing vessels at anchor must display anchor lights. An anchor light for a vessel less than 50 meters in length is an all-around white light visible for 2 miles exhibited where it can best be seen and 2 all-round white lights for greater than 50 meters. During daytime hours, Vessels at anchor shall exhibit forward where best seen, a ball shape. ▪ More direction can be found at : http://www.auxetrain.org/lights2.html	S	M	M
	Heat and Cold Stress	▪ Implement the cold/heat stress control program as appropriate to conditions. ▪ Workers will wear appropriate clothing to protect against cold or heat.	S	M	M

	Slips, Trips, Falls-	▪ Workers will be aware of potentially slippery surfaces and tripping hazards. ▪ Wear personal floatation device. ▪ Workers will keep all areas clean and free of debris to deter any unnecessary trips and falls. ▪ Clean up all spills immediately. ▪ Be aware of obstacles on deck. ▪ Personnel will notify the SSO of any unsafe conditions	S	M	M
	Waves, surges, currents.	▪ Be aware of sudden surges caused by incoming waves, unstable waters, and currents.	S	M	M
	Rain	▪ Have proper PPE (i.e. rain gear, footwear, etc) available. Be aware of slip hazards, puddles, etc.	S	M	M
	Sunshine	▪ Have sunscreen available for ultraviolet protection. Have water for dehydration.	S	M	M
	Snow or cold air temperatures	▪ Have warm, dry clothes available for cold temperatures.	S	M	M
	Severe Weather	▪ A weather radio must be available for severe weather alerts ▪ Weather reports must be checked prior to work each day	S	M	M
	Lightning	▪ Do not begin or continue work until lightning subsides for 30 minutes.	S	M	M
	High winds, dust storm	▪ Wear goggles if dust/debris is visible. ▪ Consider alteration or termination of activities if high winds are forecasted or suddenly appear.	S	M	M
	Pollen	▪ Take medication to minimize allergic reaction to pollen. Care should be taken if using medication that may cause drowsiness. ▪ Wear dust mask, if necessary.	S	M	M
Position vessel over sample location	Boat traffic	▪ Maintain a safe operating distance from shoreline, other vessels, shallow water, obstructions, debris, etc.	S	M	M
	Waves, surges, currents.	▪ Be aware of sudden surges caused by incoming waves, unstable waters, and currents.	S	M	M
	Slips, Trips, Falls-fall off boat	▪ Wear footwear that has sufficient traction to reduce risk of slipping. ▪ Wear personal flotation device, fastened shut, at all times onboard. ▪ Be aware of any obstacles on deck.	S	M	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Modified Level D- Long pants, safety glasses, hard hat (when required), steel-toed boots, nitrile outer gloves, cut proof inner gloves, high visibility personal floatation device. Equipment: water quality meter, water sampling device (e.g., dipper sampler), sample bottleware, coolers, bags of ice. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system). Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate. Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Calibrate PID daily, and fire extinguisher monthly.

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Activity Hazard Analysis (AHA) 021

Activity/Work Task: Vibracore Operation	Overall Risk Assessment Code (RAC) (Use highest code)					M
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**					
Project Number:	**Severity**	**Probability**				
Date Prepared: 4/15/2020, Revised 3-17-22		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name): Sara Weishaupt, Ed Ashton	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
Reviewed by (Name): Greg Ertel	Marginal		M	M	L	L
Employer / GBU: Parsons	Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	Hazards	Controls	P	S	RAC
Drive Vibracore into sediment and collect data	Lack of Communication Equipment Malfunction	▪ Prior to commencement of daily activities, the methods of communication will be discussed. ▪ Personnel will have access to a cell phone or other means of communication. ▪ The activities for the day will be discussed and understood prior to daily start up with review of safety issues. ▪ Batteries will be checked and recharged prior to start of days work. ▪ Conduct daily pre-use inspection of equipment. If defects or safety issues are observed remove from service	S	M	M
	Inhalation of contaminated dust Inhalation of volatile contaminants	▪ If exposure to contaminated materials occurs, promptly wash contaminated skin using soap or mild detergent and water.	S	M	M

	Ingestion of contaminants
	Skin/eye contact with contaminated materials
		▪ Wash eyes with large amounts of water.
		▪ If a person breathes in a large amount of organic vapor, move the exposed person to fresh air. Perform artificial respiration if breathing stops.
		▪ Keep the affected person warm and at rest. Obtain medical treatment for all of these situations as required.
		▪ Wear appropriate safety equipment (i.e., goggles, gloves, boots) as appropriate for reducing risk of contamination.
		▪ When transferring equipment and samples to land, follow procedures for demobilization.
		    ▪ Plan route.
		    ▪ Maintain good housekeeping.
		    ▪ Avoid lifting over 50 lbs. Use team lift. Lift using knees, not back.
		    ▪ Decontaminate equipment.			

	Pinch Points/Overhead equipment	▪ Maintain awareness of procedures underway and be attentive of vibracore operations. Keep hands and body parts out of the point of operation and hazard areas, mark with warning tape or signs if feasible ▪ Wear hard hats when around machinery and equipment. ▪ Keep observers back from active operations. Get operators attention before approaching.	S	M	M
	Muscle strain/injuries from improper lifting	▪ Personnel will utilize proper lifting techniques or ask for assistance with moving/lifting objects. ▪ Observe proper lifting techniques – lift with legs, elbows in, and keep back straight. ▪ Team lift large/awkward loads. ▪ Use mechanical means to lift if the weight is awkward or the weight is greater than 50 pounds individually or 80 pounds for team lifting. ▪ Use mechanical devices (e.g., wagon, sled) to transport equipment and samples over long distances. ▪ Take breaks frequently and rotate staff. ▪ Keep equipment secure until needed. And avoid stacking Wear steel-toed boots.	S	M	M
	Working on the Lake-trip, slip, fall off boat Drowning	▪ Wear footwear that has sufficient traction to reduce risk of slipping. ▪ Wear personal flotation device. ▪ Be aware of any obstacles on deck.	S	M	L
	Noise exposure	▪ Hearing protection will be worn in hazardous noise areas or working around heavy machinery or equipment. ▪ Wear earplugs when noise level from equipment exceeds 90 decibels (dBA) averaged over an	S	M	L

		eight-hour day.			

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Modified Level D- Long pants, safety glasses, hard hat (when required), steel-toed boots, nitrile outer gloves, cut proof inner gloves, high visibility personal floatation device. Equipment: water quality meter, water sampling device (e.g., dipper sampler), sample bottleware, coolers, bags of ice. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system). Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate. Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Calibrate PID daily, and fire extinguisher monthly.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 021 Vibracore Operation** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Sediment Sampling	Overall Risk Assessment Code (RAC) (Use highest code): **M**
Project Location: New York (Various Locations)	
Project Number:	
Date Prepared: 4/15/2020	
Prepared by (Name): Sara Weishaupt, Ed Ashton	
Reviewed by (Name): Greg Ertel	
Employer / GBU: Parsons	

Risk Assessment Code (RAC) Matrix

Severity	**Probability**				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	**E**	**E**	**H**	**H**	**M**
Critical	**E**	**H**	**H**	**M**	**L**
Marginal		**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.)
References:
PSHEP, ESHARP Manual, DASH Card

Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above).
The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.

	RAC Chart
"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	
"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	**Hazards**	**Controls**	**P**	**S**	**RAC**
Sediment Sampling	Marine Operation Hazards	▪ Check and monitor weather ▪ Use trained and authorized operator, refer to Boat Operation AHA	S	M	M
	Inhalation of contaminated dust Inhalation of volatile contaminants Ingestion of contaminants Skin/eye contact with contaminated materials	▪ If exposure to contaminated materials occurs, promptly wash contaminated skin using soap or mild detergent and water. ▪ Wash eyes with large amounts of water. ▪ If a person breathes in a large amount of organic vapor, move the exposed person to fresh air. Perform artificial respiration if breathing stops. ▪ Keep the affected person warm and at rest. Obtain medical treatment for all of these situations as required. ▪ Wear appropriate safety equipment (i.e., goggles, gloves, boots) as appropriate for reducing risk of	S	M	M

		contamination.			
	Pinch Points/Overhead equipment	▪ Maintain awareness of procedures underway and be attentive of vibracore operations. Keep hands out of pinch points. Mark or label key hazard areas to the extent possible ▪ Communicate plans with others and be aware of surroundings at all times ▪ Wear hard hats when around machinery and equipment. ▪ Keep observers back from active operations. Get operators attention before approaching.	S	M	M
	Noise Exposure	▪ Hearing protection will be worn in hazardous noise areas or working around heavy machinery or equipment. ▪ Wear earplugs when noise level from equipment exceeds 90 decibels (dBA) averaged over an eight-hour day.	S	M	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Modified Level D- Long pants, safety glasses, hard hat (when required), steel-toed boots, nitrile outer gloves, cut proof inner gloves, high visibility personal floatation device. Equipment: water quality meter, water sampling device (e.g., dipper sampler), sample bottleware, coolers, bags of ice. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone’s support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system). Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate. Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Calibrate PID daily, and fire extinguisher monthly.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

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This is to acknowledge that I have had a chance to review a copy **AHA 022 Sediment Sampling** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Sample Processing	Overall Risk Assessment Code (RAC) (Use highest code)					**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**					
Project Number:	**Severity**	**Probability**				
Date Prepared: 4/15/2020		Frequent	Likely	Occasional	Seldom	Unlikely
Prepared by (Name): Sara Weishaupt, Ed Ashton	Catastrophic	**E**	**E**	**H**	**H**	**M**
	Critical	**E**	**H**	**H**	**M**	**L**
Reviewed by (Name): Greg Ertel	Marginal		**M**	**M**	**L**	**L**
Employer / GBU: Parsons	Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each “Hazard” with identified safety “Controls” and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	“Probability” is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	“Severity” is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	**Hazards**	**Controls**	**P**	**S**	**RAC**
Packing sample for off-site shipment to lab	Accidental breakage of glass bottles	▪ Keep work area clean and clutter free. Use tables or other stable work surface at proper height to pack samples and cooler. ▪ Wear cut-resistant gloves during packaging of glass bottles. ▪ Immediate clean-up of spills.	S	M	M
	Back Injury, muscle strain/stress	▪ Personnel will utilize proper lifting techniques or ask for help with moving/lifting objects. ▪ Protect your knees with knee pads or other disposable padded material while kneeling on the ground. ▪ Use proper lifting techniques. Keep back straight, bend the knees, and lift with the legs. Use two people if load is heavier than 50 lbs. or awkward to handle.	S	M	M
	Hazardous Material Exposure	▪ Training and safety awareness of potential exposure to contaminates at the site and	S	M	M

		decontamination procedure. ▪ Appropriate PPE will be worn (e.g., safety glasses, gloves, etc.). ▪ Personnel will follow decontamination procedure. ▪ Screen for COCs with PID and mercury meter analyzer over samples and in workers breathing zone. Refer PSHEP for action levels. ▪ Ventilate work area with fans or vents			
	Slips, Trips, Falls	▪ Workers will be aware of potentially slippery surfaces and tripping hazards. Keep all areas dry, clean and free of debris to deter any unnecessary trips and falls. ▪ Avoid, remove, communication, and mark (if possible) hazards. ▪ Do not talk or text on cellphone or look at documents while walking, focus on task. ▪ Don't walk with hands in pocket. They can be used to catch you in the event of a slip, trip or fall. ▪ Work slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself and plan your route. ▪ Clean up all spills immediately and dispose properly. ▪ Avoid working at dusk, dawn, or at night. Utilize adequate lighting when indoors. ▪ Personnel will notify the SSO of any unsafe conditions.	S	M	M
	Heat and Cold Stress	▪ The SSO will implement the cold/heat stress control program as appropriate to conditions. ▪ SSO will monitor workers for heat/cold stress symptoms. ▪ Provided heated or cool break areas ▪ Use buddy system and self-monitor ▪ Hydrate ▪ Wear PPE appropriate for the conditions	S	M	M
	Eye Injury	▪ Avoid splashing, pour slowly in a controlled manner, use funnel or proper equipment ▪ PPE (safety glasses, etc.) will be worn.	S	M	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Modified Level D- Long pants, safety glasses, hard hat (when required), steel-toed boots, nitrile outer gloves, cut proof inner gloves. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system). Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate. Get Out and Look (GOAL) Equipment inspection as necessary, recorded in field book. Calibrate PID daily, and fire extinguisher monthly.

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This is to acknowledge that I have had a chance to review a copy **AHA 023 Sampling-Processing** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Driving To/From Site	**Overall Risk Assessment Code (RAC) (Use highest code)**					**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**					
Project Number:	**Severity**	**Probability**				
Date Prepared: 4/15/20		**Frequent (F)**	**Likely (L)**	**Occasional (O)**	**Seldom (S)**	**Unlikely (U)**
Prepared by: Ed Ashton, Project Manager	**Catastrophic (C)**	E	E	H	H	M
	Critical (Cr)	E	H	H	M	L
Reviewed by: Greg Ertel, SHE Representative	**Marginal (M)**	H	M	M	L	L
	Negligible (N)	M	L	L	L	L

Employer/GBU: Parsons

Notes: (Field Notes, Review Comments, etc.)
References:
PSHEP, ESHARP Manual, DASH Card

Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above).
The RAC is developed after correctly identifying all the hazards and fully implementing all controls.

P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent (F), Likely (L), Occasional (O), Seldom (S) or Unlikely (U).

S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic (C), Critical (Cr), Marginal (M), or Negligible (N)

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart
- E = Extremely High Risk
- H = High Risk
- M = Moderate Risk
- L = Low Risk

Job Steps	Hazards	Controls	P	S	RAC
1. Inspection of the vehicle.	1.1 Unsafe walking surfaces during inspection.	1.1.1 Wear proper footwear. 1.1.2 Watch footing for obstructions and slippery surfaces.	U	M	L
	1.2 Unsafe hood lift support.	1.2.1 Ensure that hood lift support is not defective and properly secured. 1.2.2 Be aware of moving vehicles during inspection and light check.	U	M	L
2. Driving to site.	2.1 Defective Vehicle.	2.1.1 Ensure that vehicle is periodically maintained. 2.1.2 Inspection of the vehicle to be carried out prior to use.	U	M	L
	2.2 Traffic Collision.	2.2.1 Competency to drive the vehicle and valid driving license should be ensured. 2.2.2 Drive defensively, courteously, and safely. Obey all traffic regulations including speed limits and travel restrictions. 2.2.3 Avoid taking unnecessary risks on the journey, taking care for own safety and health and that of other road users and others who might be affected by the actions. 2.2.4 Always use your seat belt, ensure passengers use their seat belts.	S	Cr	M

Job Steps	Hazards	Controls	P	S	RAC
2. Driving to site. (Cont…)	2.3 Lost on route / unfamiliar with road layout.	2.3.1 Ensure that site road layout has been oriented or familiarize prior to commencing journey. 2.3.2 Route map should be carried for reference. 2.3.3 Emergency card with mobile contact details should be carried to ensure further assistance regarding road direction.	U	N	L
	2.4 Hazardous road condition.	2.4.1 Avoid driving on poor road condition. Use alternate road, if possible. 2.4.2 Adjust driving according to road condition.	S	Cr	M
	2.5 Adverse weather condition.	2.5.1 Avoid driving during adverse weather conditions. 2.5.2 Adjust driving according to adverse weather condition. Never drive beyond the limits of visibility. 2.5.3 Slow down and be more alert. 2.5.4 Avoid off-road driving.	S	M	L
	2.6 Distraction while driving.	2.6.1 Avoid using mobile phone and other devices. 2.6.2 Concentrate on driving and avoid frequent adjustment of vehicle accessories. 2.6.3 Avoid eating/drinking while driving.	S	Cr	M
	2.7 Fatigue.	2.7.1 Avoid driving if feeling drowsy/sleepy/too tired. Take a break and rest. 2.7.2 Avoid heavy meals before driving.	S	M	L
	2.8 Pedestrians and School Children	2.8.1 Identify school bus/public transit times of operation and adjust schedule or driving operations as needed. 2.8.2 Be vigilant for children.	S	Cr	M
3. Arrival on site.	3.1 Parking in unauthorized area.	3.1.1 Park in designated parking areas only. 3.1.2 Avoid parking the vehicle which can obstruct others parking access/egress. 3.1.3 Use reverse parking where possible. 3.1.4 Safe distance from other vehicles to be maintained.	S	M	L

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE (Level D) - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Equipment inspection as necessary, recorded in field book.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

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This is to acknowledge that I have had a chance to review a copy **AHA 024 Driving To/From Site – Orphan Well** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Oversight of Drilling Activities	Overall Risk Assessment Code (RAC) (Use highest code)						**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**						
Project Number:	**Severity**	**Probability**					
Date Prepared: 4/15/20, Revised 3-17-22		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by (Name/Title): Greg Ertel, Ed Ashton	Catastrophic	**E**	**E**	**H**	**H**	**M**	
	Critical	**E**	**H**	**H**	**M**	**L**	
Reviewed by (Name/Title): INF	Marginal	**H**	**M**	**M**	**L**	**L**	
Employer / GBU: Parsons	Negligible	**M**	**L**	**L**	**L**	**L**	

Notes: PSHEP, Dow WP Procedures Oversight of contractor and subs on NYSDEC drilling program **Minimum PPE includes: Hard hat, High Vis Vest, Safety Shoes and Glasses, Long sleeves FRC, gloves suitable for the task** **References:** PSHEP, OSHA Standard, NYSDEC specs, ESHARP Manual, and DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	**RAC Chart**
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	**E = Extremely High Risk** **H = High Risk**
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	**M = Moderate Risk** **L = Low Risk**

Job Steps	**Hazards**	**Controls**	**P**	**S**	**RAC**
1) Evaluation of work site, establish work zones	Traffic	**Be seen Be Aware!** Wear a brightly colored traffic vest and hard hat at all times while on site. Look around corners of vehicle, equipment or buildings before entering areas of traffic. Have designated routes of travel, post and enforce site speed Limit. Parking facing out if possible use spotters when backing.	U S	Cr Cr	M M
	Working around equipment, buildings and piping	**Review Site Layout and work area** Make sure all utilities 1) have been identified and we maintain adequate distance			
	Site Security	Ensure that working surface is free of debris eliminating slips, trips and falls and there is adequate room to maneuver safely. Discuss tasks at tailgate and coordinate work activities.	S	M	M

Activity/Work Task: Oversight of Drilling Activities	Overall Risk Assessment Code (RAC) (Use highest code)				**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**				
	Slips Trips and Fall	Maintain integrity of fence, avoid confrontation with trespassers if present, Call Police if necessary All visitors must check in before starting work. Focus on task, do not talk on cell phone or look at documents while walking Wear fully laced safety shoes. Be aware of debris , water or other slippery surfaces and avoid, mitigate or walk with extreme caution **SITE SPECIFIC FIELD COMMENTS:** **Be aware of, holes and rough terrain** **Use construction fence and barriers as needed and keep public out of work zone. Establish Traffic Control according to Permit**			
2) Oversight of drilling	Slip, trip & fall Exposure to COCs Noise Airborne debris	Mark or remove any trip hazards in the work zone. Keep clear of equipment, establish exclusion zones around equipment. Be conscious of exposure. Workspace monitoring with LEL and PID if significant odors are detected . Communicate the detection of measurable PID/LEL readings immediately to field team. Avoid contact with driller, do not touch debris or materials without gloves. Follow decon procedures and use good hygiene practices, no eating, drinking or smoking in the exclusion zone **Monitoring Requirements Below:** - Continuous monitoring with Multi-RAE Meter with focus on H2S during active well work; move upwind, ventilate if detected, if levels are sustained above 10 ppm in the Breathing Zone (BZ), stop work and contact Health and Safety - LEL/multi-RAE meter; no ignition sources near well head, stay upwind and ventilate, if sustained total VOCs are >10 ppm in BZ consult with driller Stop Work and contact Health and Safety if levels are not reduced - LEL – stop work if 10% or greater is measured in the BZ - Zero/Bump check meter daily, calibrate weekly Wear hearing protection (ear muffs or foam inserts) if difficult to communicate or working around high noise equipment Use techniques to minimize/keep down dust, use wetting as needed. Stand upwind. Wear safety glasses, use spoggles or goggles in high winds.	S U S S	M M M M	M M M M

Activity/Work Task: Oversight of Drilling Activities	Overall Risk Assessment Code (RAC) (Use highest code)	**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**	

	Electrical Contact with overhead lines	Potential for contact with electrical systems. Stay out of the exclusion zone unless trained and authorized to do so. Only trained employees will be involved in electrical work. Identify and point out low OH lines to contractor as part of orientation, maintain at least 10' of clearance			
3) Begin Drilling activities	Struck-by or caught between equipment Slip, trip & fall Contact & entanglement with hazards and points of operation from hand or power tools Exposure to COCs Noise Airborne debris Head bump	Conduct area survey and follow plan for controlled drilling. Continuous housekeeping during operations. Inspect equipment before use, only use trained operators. Follow manufacturer's instructions. Be very aware of the dangers of loose clothing near rotating machinery. Inspect tools and operate according to manufacturer's guidelines, only trained authorized operators will use in designated areas Wear hearing protection (ear muffs or foam inserts). Use techniques to minimize/keep down dust. Stand upwind. Wear safety glasses. Wear hard hat to protect head from head bump hazards or falling equipment. Use proper body mechanics when carrying equipment or packages Avoid bending at the waist, twisting or awkward postures. Get a firm grip on the load and plan your route. Use two person lift for loads greater than 50 pounds **FIELD COMMENTS:** **Stay a safe distance from contractors, notify them and be sure it is safe before approaching**	S S U S S U	M Cr M M M C	M M M M M M

Activity/Work Task: Oversight of Drilling Activities	Overall Risk Assessment Code (RAC) (Use highest code)			**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**			

	Lifting – muscle/joint strain				
4)Conduct Air Monitoring as needed for VOCs if in area expected to be contaminated	Strains and sprains carrying equipment Working in proximity of equipment – Struck By Lacerations to hands and fingers Slips, Trips, Falls	Carry equipment in boxes or totes, do not lift over 50 lbs alone, use Carts or dollies. Plan route, avoid hazards and rough terrain. Do not enter work zones until acknowledged by operator and equipment stopped. Be aware of surroundings and focus on task Wear cut resistant glove, focus on placement of hands, do not put into danger areas or pinch points. See above, focus on task and be aware of surroundings.	S	M	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE (Level D) - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Equipment inspection as necessary, recorded in field book.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 025 Oversight of Drilling Activities – Orphan Well** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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<table>
<tr><td>Activity/Work Task: Waste Characterization Sampling</td><td colspan="5">Overall Risk Assessment Code (RAC) (Use highest code)</td><td>M</td></tr>
<tr><td>Project Location: New York (Various Locations)</td><td colspan="6">Risk Assessment Code (RAC) Matrix</td></tr>
<tr><td rowspan="2">Project Number:
Date Prepared: 4/15/20</td><td rowspan="2">Severity</td><td colspan="5">Probability</td></tr>
<tr><td>Frequent</td><td>Likely</td><td>Occasional</td><td>Seldom</td><td>Unlikely</td></tr>
<tr><td rowspan="2">Prepared by (Name/Title): Ed Ashton</td><td>Catastrophic</td><td>E</td><td>E</td><td>H</td><td>H</td><td>M</td></tr>
<tr><td>Critical</td><td>E</td><td>H</td><td>H</td><td>M</td><td>L</td></tr>
<tr><td rowspan="2">Reviewed by (Name/Title): Greg Ertel</td><td>Marginal</td><td>H</td><td>M</td><td>M</td><td>L</td><td>L</td></tr>
<tr><td>Negligible</td><td>M</td><td>L</td><td>L</td><td>L</td><td>L</td></tr>
<tr><td>Employer/GBU: INF</td><td colspan="6">Step 1: Review each “Hazard” with identified safety “Controls” and determine RAC (See above).
The RAC is developed after correctly identifying all the hazards and fully implementing all controls.</td></tr>
<tr><td rowspan="6">Notes: (Field Notes, Review Comments, etc.) References :
Level D PPE Required including:
• Steel toed boots
• Safety glasses
• High Visibility Safety Vest and FRC Clothing
• Work gloves when handling equipment
• Nitrile Gloves for Sampling activities
• Hard hat
• Hearing protection available as needed
• PSHEP, ESHARP Manual, DASH Card</td><td colspan="5">P “Probability” is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.</td><td>RAC Chart</td></tr>
<tr><td colspan="5" rowspan="2">S “Severity” is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible</td><td>E = Extremely High Risk</td></tr>
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<tr><td colspan="5" rowspan="3">Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each “Hazard” on AHA. Annotate the overall highest RAC at the top of AHA.</td><td>M = Moderate Risk</td></tr>
<tr><td>L = Low Risk</td></tr>
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Job Steps	Hazards	Controls	P	S	RAC
1. Mobilization / Staging	1a. Trip & fall 1b. Musculoskeletal Disorders (MSD) 1c. Poor planning results in hazard, incident, or injury 1d Struck by Moving Equipment 1e. Positioning the equipment results in hazard, incident, or injury	1a. Position equipment and tools as to NOT create a trip hazard. 1a. Maintain good housekeeping throughout the project. 1a. Keep pathways clear of vegetation, tools/equipment and debris. 1a. Mark, identify, or barricade potential hazards 1a&b. Never carry a load that blocks your vision of the pathway in front of you. 1b. Observe proper lifting techniques – lift with legs, elbows in, and keep back straight. 1b. Team lift large/awkward loads.	U	Ca	M

		1b. Use mechanical means to lift if the weight is awkward or the weight is greater than 50 pounds individually or 80 pounds for team lifting 1b. Avoid prolonged bending, awkward positions, and repetitive movements. 1c. Prior to beginning the day's activities, hold a H&S toolbox with the work crew detailing the potential hazards. 1c. Review in detail the activities to be conducted that day. 1c. Prior to beginning activities each day, ensure that the team has performed their daily inspection. 1c. Confirm the sampling locations and identity. 1d. Wear high visibility reflective safety vest or high visibility clothing. 1e. Blow the horn 3 times before backing if the Parsons field vehicle does not have back up alarms. 1e. Position the field vehicle out of the way of site traffic with cones surrounding vehicle and flashers active. 1e. Use spotters to position the field vehicle and complete a 360 degree vehicle walk to determine if any equipment or debris are located in the path of the vehicle.			
2. Waste Characterization Sampling Activities	2a. Site chemicals of concern 2b. Pinch points 2c. Stung by wasp / bee 2d. Pressurized Tank 2e. Changing conditions 2f. Cut by glass	2a. Ensure an eye wash station is located close by or have a portable eye wash station located with the support vehicle. 2a. Locate the rally location and alternate rally location in case of an emergency. Never cross down wind of an emergency condition 2b. Ensure that crew is wearing the appropriate PPE including: FRC clothing, hard hat, safety glasses, and steel-toed boots, work gloves, nitrile gloves for contact with groundwater, and hearing protection (As needed). 2c. Check the sampling location for possible wasps or wasps or bee nests in flush mount. If wasps or bees are present then spray the affected area. Let the area rest for 30 minutes and come back. 2c. If a field team member is stung move to a safe location and circle the affected area with a marker and check your field team member's health. Call Work Care at 888-449-7787 for guidance. Notify the project team and facility of the incident.	**S**	**Cc**	**M**

		2c. If a field team member is allergic to bees or wasps check to make sure there epi pen is present and it is in date before going into the field. 2d. To avoid being in a line-of-fire situation or getting well vapors in your face, stand to the side while removing any lids or caps in the sampling area (e.g., tank lids, well caps, hose caps, etc.) 2e. If conditions encountered in the field are not what is expected ANY TEAM MEMBER MAY STOP WORK to ensure the team and the sites safety.			
3. Packing sample coolers	3a. Pinch points 3b. Cut by glass and preservative burn (sample containers) 3c. Musculoskeletal Disorders (MSD) 3d. Changing conditions	3a. Ensure that crew is wearing the appropriate PPE including: hard hat, high vis vest or clothing, safety glasses, and steel-toed boots, work gloves, nitrile gloves for contact with groundwater, and hearing protection (As needed). 3a & c. Use care and do not rush, coolers can be heavy and the lids, and bottles can be pinch points. 3a. Watch tailgate and doors as coolers are often placed in field vehicles to ship samples. Take your time to avoid pinching your fingers. 3b. When packing the coolers inspect the sample container for damaged samples using a combination of nitrile and cut resistant gloves to avoid the potential of being cut by possible broken sample containers and contact with contaminated water. 3b Visually inspect coolers before placing hand inside the coolers to try to identify and remove damaged sample containers for disposal. 3c. Never carry a load that blocks your vision of the pathway in front of you. 3c. Observe proper lifting techniques – lift with legs, elbows in, and keep back straight. 3c. Team lift coolers over 50 pounds. 3c. Avoid prolonged bending, awkward positions, and repetitive movements. 3d. If conditions encountered in the field are not what is expected ANY TEAM MEMBER MAY STOP WORK to ensure the team and the sites safety.	**O**	**S**	**M**
4. Site Exposure	4a. Dehydration	4a. Review Section 9.2 of the site-specific PSHEP	**U**	**Cr**	**L**

	4b. Environmental Hazards Including: insects, poison ivy, snakes, rodents, etc… 4c. Sunburn 4d. Trip and Fall 4e. Thunder Storms 4f. First Aid 4g. Communications 4h. Site Contaminants of Concern	4a. Provide sufficient amounts of cool water, at least one quart per employee per hour for the entire work day. 4b. Watch for signs of heat stress in field team members. If high humidity and or high temperature conditions arise than institute heat stress monitoring and prevention protocols. 4a. Use the "buddy system" to monitor fellow employees for signs of heat stress/stroke. 4a. Provide access to shaded area. 4a. Try to schedule work during the cooler hours of the day. 4b. Watch for spiders, flying insects, snakes, etc. 4b. Be mindful of poison ivy, oak and sumac. Remember: Leaves of three; let it be. 4b. Wear poison ivy barrier cream if necessary. 4b. Wear mosquito repellant if necessary 4c. Wear sunscreen and hat as necessary 4d. Configure operations (equipment, coolers, etc.) as to minimize trip hazards. 4d. Mark-out or barricade pot-holes and other trip hazards. 4e. If lightning is observed or thunder is heard, suspend work until 30 minutes have passed without the occurrence of lightning/thunder. Allow time to secure equipment from potential heavy rain, heavy wind, and hail. Seek proper cover. 4f. Parsons truck is equipped with a first aid kit and eye wash. 4f. Contact Work Care at (888) 449-7787 for medical guidance and notify the project team of any incident 4g. All field personnel must be equipped with a cellular phone for communication purposes. 4h. Wear the appropriate PPE – review the Notes on page 1 of this AHA.			
5. Site Specific Hazards	5a. Site Control 5b. Site Traffic	5a. Sign in and sign out when accessing or departing the site. 5b. Wear appropriate PPE including high visibility vest or high visibility clothing 5b. Inform the crew of the site traffic. 5b. Inform crew to give site traffic the right-of-way. 5c. Establish an upwind meeting point and reevaluate the location throughout the day based on wind direction.	**S**	**Cr**	**M**

Equipment to be Used	Training Requirements/Competent or Qualified Personnel	Inspection Requirements
PPE (Level D) - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Equipment inspection as necessary, recorded in field book.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 026 Waste Characterization Sampling – Orphan Well** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

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Activity/Work Task: Field Oversight/Site Walk	Overall Risk Assessment Code (RAC) (Use highest code)						M
Project Location: New York (various sites) **Project Number:**	**Risk Assessment Code (RAC) Matrix**						
	Severity	**Probability**					
Date Prepared: 04/15/2020		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by: Ed Ashton	Catastrophic	E	E	H	H	M	
	Critical	E	H	H	M	L	
Reviewed by (Name/Title): Greg Ertel	Marginal	H	M	M	L	L	
Employer / GBU: Parsons	Negligible	M	L	L	L	L	
Notes: (Field Notes, Review Comments, etc.) **References:** PSHEP, ESHARP Manual, DASH Card	**Step 1:** Review each "Hazard" with identified safety "Controls" and determine RAC (See above). **The RAC is developed after correctly identifying all of the hazards and fully implementing all controls.**						
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.				**RAC Chart**		
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible				**E = Extremely High Risk** **H = High Risk**		
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.				**M = Moderate Risk** **L = Low Risk**		

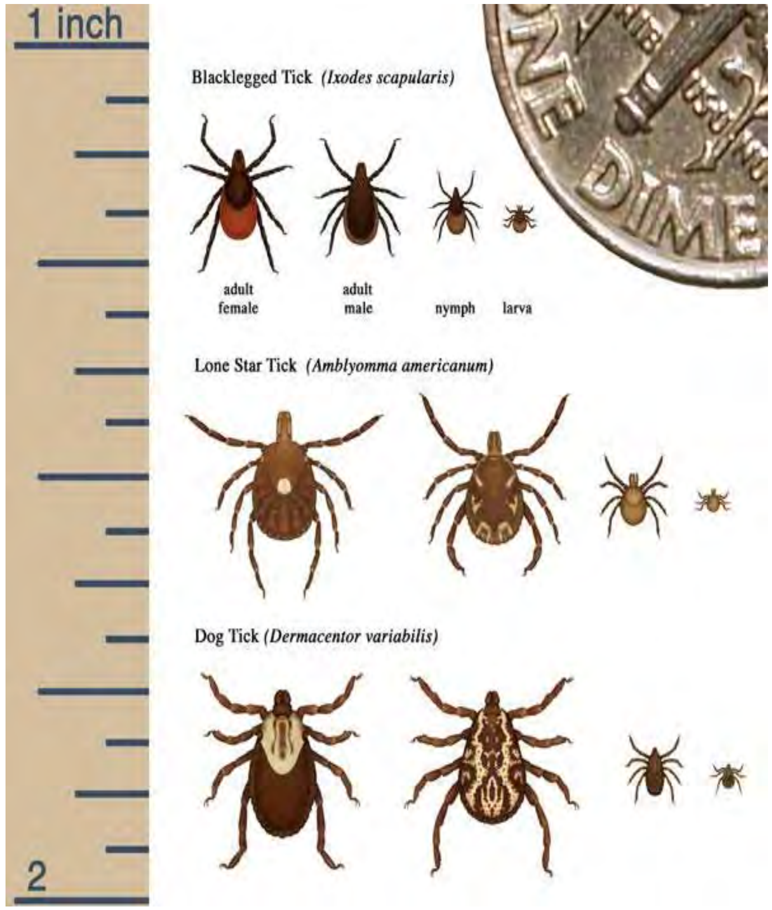
Job Steps	Hazards	Controls	P	S	RAC
Field Oversight/Site Walk	Slips, Trips, Falls (due to uneven ground, or various debris)	▪ Workers will be aware of potentially slippery surfaces and tripping hazards. Do not talk on cell phone or look at documents while walking, focus on task. ▪ Walk slowly during transit. Jumping, running, and horseplay are prohibited. ▪ Workers will keep all areas clean and free of debris to deter any unnecessary trips and falls. ▪ Wear ankle high safety shoes fully laced with good tread, keep hands out of pocket in case of fall. Do not carry more than 50 lbs by yourself, and plan your route. ▪ Clean up all spills immediately. ▪ Personnel will notify the Project Manager of any unsafe conditions	O	M	M
	Rain	▪ Have proper PPE (i.e. rain gear, footwear, etc.) available. Be aware of slip hazards, puddles, etc.	O	M	M

	Working Around Heavy Equipment	▪ Discuss and understand the overall hazards and operation of the heavy equipment and drill rig with the contractor supervisor and operator. Understand procedures and lines of communication during operation of equipment. Verify H2S monitoring is occurring and action levels are not exceeded. ▪ Discuss and review overhead hazards with contractor supervisor and operator. Survey overhead area of the drill rig prior to approaching to identify and obvious hazards. Wear hardhat and steel toe boots. ▪ Discuss and review areas of heavy equipment and drill rig operations where stored energy poses a line-of-fire risk and hazard. Avoid personnel being present in those areas during operations that pose a line-of-fire risk or hazard. ▪ Discuss and review blind spots of various equipment and drill rig. Understand lines of communication (line-of-sight, hand signals, etc.) to the operator of such equipment. Avoid blind spots during operations. ▪ Identify kill switches or procedure for de-energizing equipment in the event of an incident. ▪ Understand site emergency signals and sirens from equipment. ▪ Use three points of contact when getting in and out of equipment	S	Cr	M
	Sunshine	▪ Have sunscreen and safety sunglasses available for ultraviolet protection. Have water for dehydration.	O	M	M
	Biological Hazards	▪ Know how to recognize biological hazards (see photos below) ▪ Avoid contact with poison ivy ▪ Use caution when opening wells to avoid being bit by insects ▪ Personnel will be aware of potential exposure to biological hazards. ▪ Wear appropriate clothing (hard hat, minimum short -sleeve shirt, long pants, gloves, boots etc.) and insect repellant. ▪ Conduct tick check daily, ▪ If you observe a tick, remove using approved methods, refer to Workcare guidance. If a rash or any symptoms develop call Workcare	O	M	M
	Lightning/Thunder	▪ Monitor Weather Forecast and Communicate to On-site Personnel ▪ Do not begin or continue work until lightning subsides for 30 minutes. Check weather forecast, reschedule if there is a severe weather warning.	O	M	M
	High winds, dust storm	▪ Wear goggles if dust/debris is visible. Stop work if vision is significantly impaired or creates unsafe conditions. ▪ Shut down rig operations for gusts over 35 mph	O	M	L

	Cold and Heat Stress	▪ Visitors will dress accordingly to prevent injuries from extreme heat, or cold. ▪ SSHO will monitor for cold/heat stress symptoms. ▪ Drinks for hydration will be available ▪ Break areas for cooling or warming will be available	O	M	M
	Site Hazards Material Exposure	▪ Conduct air monitoring of Oxygen, LEL, CO, H2S, and VOCs. Action Levels as follows: o Oxygen: At 19.5% or below – Exit area, provide adequate ventilation, or proceed to Level B, or discontinue activities Verify presence of adequate oxygen (approx. 12% or more) before taking readings with LEL meter. Note: If oxygen levels are below 12%, LEL meter readings are not valid. o LEL: Less than 10% LEL – Continue working, continue to monitor LEL levels. Stop work at >10% and exit area. o H2S: At greater than 10 ppm, exit area and discontinue activities o CO: At greater than 35 ppm, exit area, provide adequate ventilation or discontinue activities. o VOCs: From 5 ppm to 25 ppm: Ventilate, or Discontinue Activities. If greater than 25 ppm: Discontinue Activities, wait for proper ventilation to occur ▪ Training and safety awareness of potential exposure to contaminates at the site. ▪ Practice contamination avoidance, work upwind if feasible, limit contact to the extent possible, and do not eat in areas with potential exposure, keep drink containers covered. ▪ Appropriate PPE will be worn dependent on site conditions and actions levels. ▪ Must sign off on health and safety plan.	O	M	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE (Level D) - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Equipment inspection as necessary, recorded in field book.

Ticks


1 inch
Blacklegged Tick (Ixodes scapularis)
adult female
adult male
nymph
larva
Lone Star Tick (Amblyomma americanum)
Dog Tick (Dermacentor variabilis)
2

Hogweed

Poison Ivy

3-point contact—Vehicles and equipment

Explain dangers

Getting on and off equipment is not as easy as it sounds. More than one-quarter of all injuries to equipment operators and truck drivers occur during mounting and dismounting.

Identify controls

To climb on and off construction equipment safely, always maintain three points of contact.

That means two hands and one foot or two feet and one hand on the equipment at all times.

Three-point contact forms a triangle of anchor points that changes in form while you mount or dismount. You have the most stability when the centre of this triangle is close to your centre of gravity.

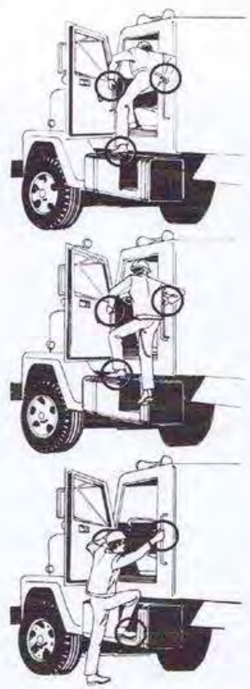
Your weight should be evenly distributed among the three contact points. This means that you should avoid sideways movement because it can put you off balance.

- Take your time and always face the vehicle or equipment when mounting and dismounting.
- Climb on and off only when the equipment is standing still.
- Break 3-point contact only when you reach the ground, the cab, or a stable platform.
- Use the parts designed by the manufacturer for mounting and dismounting—steps, footholds, running boards, traction strips, handgrips, etc.
- Keep these parts clear of mud, snow, grease, and other hazards that can cause slips, trips, or falls.
- Take extra care in wet, snowy, icy, or other dangerous weather conditions.
- Don't use wheel hubs, machine tracks, or door handles for mounting and dismounting.
- Avoid wearing loose or torn clothing that can catch on something.
- Don't jump down when exiting the vehicle.

Demonstrate

Demonstrate 3-point contact by mounting and dismounting from a truck, bulldozer, or other piece of heavy equipment on site.

Ask your crew to try out 3-point contact as well.



Vehicles and Equipment 57 IHSA.ca Work Safe for Life

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

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Activity/Work Task: Site Visit or Site Walk with Ticks and Bio Hazards	Overall Risk Assessment Code (RAC) (Use highest code)						**M**
Project Location: New York (Various Locations)	**Risk Assessment Code (RAC) Matrix**						
Project Number:	**Severity**	**Probability**					
Date Prepared: 4-15-20		Frequent	Likely	Occasional	Seldom	Unlikely	
Prepared by: Greg Ertel	Catastrophic	**E**	**E**	**H**	**H**	**M**	
	Critical	**E**	**H**	**H**	**M**	**L**	
Reviewed by (Name/Title): Greg Ertel	Marginal		**M**	**M**	**L**	**L**	
Employer / BU: Parsons / INF	Negligible	**M**	**L**	**L**	**L**	**L**	

Notes: (Field Notes, Review Comments, etc.)
References:
PSHEP, ESHARP Manual. Workcare and CDC guidance, DASH Card

Workcare #: 1-888-449-7787

Place in your cell phone

Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above).
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Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

- **E = Extremely High Risk**
- **H = High Risk**
- **M = Moderate Risk**
- **L = Low Risk**

Ticks **Bio hazards**	Biological Hazards (ticks, bees, mosquitoes, snakes, etc.)	▪ Personnel will be aware of potential exposure to biological hazards ▪ If feasible have the area pre-cleared with mechanical means (brush hog, etc) ▪ Wear appropriate clothing – long sleeves and pants with DEET based insect repellant applied to exposed skin. (Deet on the exposed skin, Permetherin on clothes) Use Tyvek taped at ankles and wrist if working in vegetation or high-risk areas. ▪ Wear Rynoskin under clothing in high risk areas ▪ Do a thorough buddy and self ick check throughout the day and before getting into vehicle. ▪ If you discover an embedded tick remove with tweezers as soon as feasible and save tick if possible. ▪ If a tick embeds report to your Supervisor and call Workcare # 1-888-449-7787 for guidance	S	Cr	M

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE (Level D) - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site-specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Equipment inspection as necessary, recorded in field book.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 028 Site Visit or Site Walk with Ticks and Bio Hazards – Orphan Well** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

NAME	SIGNATURE	COMPANY	DATE	CRAFT	TRAINER	TRAINER SIGNATURE
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Work Activity/Task: Working near water or on boat on water	**Overall AHA Risk Assessment (Highest RAC)**						**M**
Client/Project Name: New York (Various Locations)	**Risk Matrix**						
Project Location:	**Severity**	**Probability**					
Date Prepared: 2/11/2020. Revised 3-17-22		**Frequent (F)**	**Likely (L)**	**Occasional (O)**	**Seldom (S)**	**Unlikely (U)**	
Prepared by (Name/Title): Greg Ertel, Program HS Manager, Ed Ashton	**Catastrophic (Ca)**	E	E	H	H	M	
	Critical (Cr)	E	H	H	M	L	
Reviewed by (Name/Title): Greg Ertel, Program HS Manager	**Marginal (Ma)**	H	M	M	L	L	
	Negligible (Ne)	M	L	L	L	L	
Employer / GBU: Parsons	**Step 1**	Assign a probability and severity code for each hazard identified, and a corresponding code after implementing controls.			**Risk Assessment Code (RAC)**		
	Step 2	Assign a RAC using the risk matrix (E, H, M, or L) after implementing controls. Low Risk is the desired target, but Moderate Risk is acceptable. If the risk is High or Extremely High, then use different controls.			**E = Extremely High Risk (Unacceptable)**		
Field Notes, Comments, References, etc.: PSHEP, ESHARP Manual, DASH Card	**Step 3**	Annotate the overall highest RAC and color at the top of AHA.			**H = High Risk (Unacceptable)**		
	Probability is the likelihood to cause an incident, near miss, or accident and identified as: Frequent (F), Likely (L), Occasional (O), Seldom (S) or Unlikely (U).				**M = Moderate Risk (Acceptable)**		
	Severity is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic (Ca), Critical (Cr), Marginal (Ma), or Negligible (Ne).				**L = Low Risk (Target)**		

Job Steps (copy/paste more rows if necessary)	Hazards	Controls	P	S	RAC
Check weather	Heavy rain, snow, hail, high winds impeding safe work practices	Do not work in inclement weather. Reschedule in the case of heavy rains, snow, sleet, hail or high winds. Monitor conditions throughout the day and stop work as necessary.	O	Ne	L
Traffic / Driving to Site	Vehicle accident	Inspect vehicles prior to trip. Plan your route and make sure you are rested and focused on driving. Fall all posted speed limits and signs, drive defensively; keep 3 seconds of following distance. Avoid distractions, do not use cell phone or electronic device.	O	Ma	M

Job Steps (copy/paste more rows if necessary)	Hazards	Controls	P	S	RAC
Unloading Equipment and working within 3 feet fo the waters edge.	Slip, Trip, and Fall	Ensure the use of appropriate foot wear and keep shoe laces tied. Ensure that the area is free from waste/scrap material. Avoid muddy ground where possible. Plan your route and take the safest path, Do not talk on cell phone or look at documents while walking. Wear chest waders while near or over water, as necessary. If water enters wader, take off wader to remove water. Wear a life jacket while 3 ft from waters edge. Wear Mustang Survival suit when working from boat in winter when water and air temperature are 85 or below Maintain safe distance from edge of water when possible and be aware of edge of lake at all times. Always wear a life jacket while working on water. Freezing cold temperatures. Self and buddy monitor, where cold weather clothes, gloves and Mustang suit when working in boat. Have a warm break area and stay hydrated.	S	Ma	**L**
	Drowning	Always wear a life jacket while working on water. Ensure that rescue/ emergency procedures are in place. Always use buddy system while working on water and have a throwable rescue device with 90 feet of line readily available..	U	Ca	**M**
	Ergonomic/lifting injuries Pinch points	Ensure proper lifting techniques are used. Stand close to the load with feet spread to shoulder width apart, and bend at the knees to pick up heavy objects. Get a firm grip before lifting, and lift with your legs. Keep your hands out of hazard areas/pinch points, wear work glovles Use two person carries for large or heavy equipment such as boats. Plan your route and carrying method. Check area for hazards in the pathway to be used for carrying equipment prior to lifting or carrying.	O	Ma	**M**
Pushing boat or boats into the water	Slips, trips, and falls	Position boat to allow stable entrance from shore, and shove off, use a pole or paddle to push off and minimize need to stand in water.	S	Ma	**L**
Marking or surveying sample locations – working on just one boat	Pinch points	Push stake into soft sediment without hammer first to minimize hammering and ensure a more stable surface. Wear work gloves when using a stake and hammer	S	Ma	**L**
	Tip and fall from leaning over the edge of the boat	Two people should be in the boat, and the second person should be acting as a counterweight when one person is leaning over the water. Avoid over reaching and awkard postures. Work from knees and try to stay low to avoid falls.	S	Ma	**L**
	Hypothermia	Wear an exposure suit or dry suit when the combined air and water temperature is below 85 degrees	U	Ca	**M**
	Drowning	Always wear a USCG approved life jacket or exposure suit while working on water.	U	Ca	**M**

Job Steps (copy/paste more rows if necessary)	Hazards	Controls	P	S	RAC
Launching boats	Pinch points	Wear work gloves when attaching boats with clamps and rods. Be aware of hand placement and keep hands out of hazard areas. Plan the task and communicate among work crew.	S	Ma	L
	Slips, trips, and falls	Ensure the use of appropriate foot wear and keep shoe laces tied.	S	Ma	L
		Ensure that the area is free from waste/scrap material.			
		Avoid muddy ground where possible. Plan your route and take the safest path, Do not talk on cell phone or look at documents while walking.			
		Wear chest waders while near or over water, as necessary. If water enters wader, take off wader to remove water.			
		Wear a life jacket while 3 ft from waters edge.			
		Maintain safe distance from edge of water when possible and be aware of edge of lake at all times.			
		Always wear a life jacket while working on water. Freezing temperatures. Wear Mustang survival suit when working from boats.			
	Ergonomic/lifting injuries	Ensure proper lifting techniques are used. Stand close to the load with feet spread to shoulder width apart, and bend at the knees to pick up heavy objects. Get a firm grip before lifting, and lift with your legs.	O	Ma	M
		Use two person carries for large or heavy equipment such as boats.			
		Plan your route and carrying method. Check area for hazards in the pathway to be used for carrying equipment prior to lifting or carrying.			
Anchor/Tow line set up	Splash Hazards	Minimize throwing distance for sending rope to opposite shore. Wear gloves for throwing catching, and any on water work.	S	Ne	L
	Incompetent anchor points	Anchor first at the shore near the location of entering the water. From the potential boring location, row in a straight line to the opposite shore, and throw rope to a person on the shore. Choose adequate anchor points such as live trees and jersey barriers. Keep oars on boat as a back up method to move boat around.	U	Ne	L
	Tips and falls	Two people should be in the boat, and the second person should be acting as a counterweight when one person is leaning over the water. Avoid awkward postures and over reaching.	S	Ma	L

Job Steps (copy/paste more rows if necessary)	Hazards	Controls	P	S	RAC
Working on boat to install casing, hand auger, drivable geoprobe (slide hammer) 2-3 ft samplers acetate liners	Injured from slapping branches	When the boat is ready to be put on the lake from the trailer prior start of probing activities, cut any branches and obstacle that are in the way.	S	Ma	**L**
	Pinch or crushed fingers	Wear leather gloves when getting the boat off the trailer and into the water Use handles on boat, and keep hands away from areas where boat contacts the trailer rails. Slide hammer	S	Ma	**L**
	Ergonomics/Exertion	Kneeling in the boat, minimize standing, if standing work toward center, maintain 3 points of contact while moving to a standing position, maker sure there is a plywood center between 2 boats Limit time while working on hand augering or slide hammer use. Work in short spurts, rotate high demand tasks, take breaks as needed.	S	M	L
	Slip, Trip, and Fall	Ensure the use of appropriate foot wear and keep shoe laces tied. When working off the side of the boat communicate with buddy and have them off-set the weight on the other side of the boat. Keep boat equipment neat and in good order. Don't leave unnecessary equipment where it will be a tripping hazard. Ensure that the area is free from waste/ scrap material. Always wear a life jacket while working on water. Be aware of edge of boat at all times.	S	Ma	**L**
	Rods getting stuck	Use a pipe wrench to rotate, then hammer again			
	Hypothermia	Wear a exposure suit, dry suit, or insulated neoprene wet suit when the combined air and water temperature is below 85 degrees	U	Ca	**M**
	Drowning	Always wear a life jacket while working on water. Always use buddy system while working on water. Have a throwable rescue ring with line readily available and use the buddy system when working near water.	U	Ca	**M**
Handing off Samples	Slips trips, passing samples forward	Minimize trips (maximize samples , buddy system passing of samples, check clamps when on shore	U	Ca	**M**

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Personal Protective Equipment.and boat USCG approved lifejacket or buoyant work vest or Mustang buoyant exposure suits waders if needed PPE (Level D) - Long pants, safety glasses, hard hat (in presence of heavy equipment), high-visibility vest/clothing, steel-toed boots, gloves, goggles. Depending on environment at project site: blanket, sunscreen, cold/hot drink, extra clothing, traffic warning signage, cones, hi-vis markers, etc, fire extinguisher, insect repellent.	All personnel engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances or health hazards shall receive appropriate training as required by 29 CFR 1910.120(e), including, but not limited to, initial 40-hour, 8-hour Supervisor and annual 8-hour refresher. Medical qualification, training and fit-testing must be received on an annual basis for individuals that wear a respirator. If an individual wears a respirator more than 30 days per year, or they are exposed at or above the Permissible Exposure Limit (PEL) of a chemical for more than 30 days in a year, then they must participate in a Medical Surveillance Program as required by 29 CFR 1910.120(f). All assigned employees are required to familiarize themselves with the contents of this AHA before starting a work activity and review it with their Supervisor during their Daily Safety Huddle. All personnel performing work onsite must have received the site specific orientation. Competent FA / CPR / AED responder will be onsite while all work is occurring at all times. *Parson personnel shall not operate any subcontractor equipment.* STOP WORK AUTHORITY Right, Obligation and Responsibility Every single employee has the responsibility and the authority to STOP WORK at any time necessary to protect the safety or health of themselves, others, and the environment. Anyone can execute this responsibility without repercussions. We believe that the GOAL OF ZERO is possible with everyone's support and commitment.	PPE and boat to be inspected prio to and after each use Ongoing environmental condition inspection (weather, wind, heat, cold). Ongoing personnel inspection (buddy system) Inspection of work area for general hazards as covered under this AHA prior to beginning any task. Take 5 Card when appropriate Equipment inspection as necessary, recorded in field book.

ACTIVITY HAZARDS ANALYSIS TRAINING ACKNOWLEDGEMENT AND SIGN OFF

Read Carefully Before Signing Below

This is to acknowledge that I have had a chance to review a copy **AHA 029 Working Near Or On Boat On Water** and have been trained on its contents. I understand a copy will be provided to me upon request. I will read and abide by all requirements of the aforementioned AHA and any additional rules and regulations of my job. I understand that working safely, complying with and obeying any and all Company safety rules, regulations or standards is a condition of my employment. Should I not comply with Company safety rules, regulations or standards, I am subject to disciplinary action including removal from the site and possible termination of employment.

NAME	SIGNATURE	COMPANY	DATE	CRAFT	TRAINER	TRAINER SIGNATURE
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APPENDIX H

ORDER FOR TREATMENT OF WORK-RELATED INJURY OR ILLNESS

WC Injury Management Workflow

When an injury occurs, provide caring, nonjudgmental response to the injured employee. Determine the extent of the injury and arrange for the appropriate level of medical attention. Maintain regular ongoing contact with the injured employee during his/her recovery. The employee's supervisor must complete IndustrySafe Online Incident Report within (4) hours of his/her knowledge of the incident. Additionally, the employee's supervisor must promptly notify the BU SH&E Director.

For Serious/Life Threatening, Emergency Medical Care Required

#1 – Immediate Response

1. CALL 911 or Local Emergency Medical Services
2. Contact designated Project/Office Personnel — *Heather Budzich (315.857.8375)*
3. Contact designated BU SH&E Contact — *Greg Ertel* (585.465.0557)
4. As required, contact client, any others — *George Momberger* (518-402-9814)
5. Call WorkCare. **Available 24/7**. Available for Parsons' employees and agency employees.
   From North America: 888.449.7787; from outside North America: 714.456.2104

#2 – Medical Care

1. Supervisor (preferred) or designated alternate shall accompany the injured employee or follow to medical provider (Also, see #3 below)
2. Provide the Order for Treatment Forms to the medical provider at the time of the initial evaluation
3. Inform medical provider that temporary light/alternate duty is available
4. Obtain work status note from injured employee after each and every re-evaluation
   a. Provide copy to WC Claims Manager
   b. During recovery, identify temporary light-duty or alternate assignments necessary to accommodate injured employee's return to work based on work restrictions outlined by the medical provider

#3 – Post Accident Drug/Alcohol Screen

Not Applicable

Parsons does not have a companywide mandated post accident substance screen/policy. It is the responsibility of our projects to know whether or not their project requires such and if so, the project must set-up post accident drug screen process/protocol thru TM with their designated occupational clinic; and at the time of an employee's initial evaluation for a work related injury/illness, request that the medical provider perform this screen.

#4 – Reports/Investigation/Follow-up Activities

1. Complete IndustrySafe Online Incident Report within (4) hours
2. Complete WC Accident Reports and submit to WC Claims Manager
3. Complete any other required project or client specific injury/accident forms
4. Take active role in root cause accident investigation. Take corrective actions. Contact BU SH&E Director re: your role in the investigation
5. Consult with BU SH&E Director to make OSHA recordability determination
6. Maintain ongoing contact with the injured employee during his/her recovery
7. Complete final investigation report in IndustrySafe within (72) hours
8. Immediately notify WC Claims Manager & TM if employee misses time from work

For non-medical emergency that may require clinical consultation

#1 – Immediate Response

1. Tend to the injured employee, assess the extent of the injury and arrange for appropriate level of medical attention
2. Promptly call WorkCare,*before* employee seeks medical care for Parsons' employees and agency employees. Available **24/7**
   From North America: 888- 449-7787; from outside N. America: 714.456.2104
3. Contact designated Project/Office Personnel — *Add name(s)/number(s)*
4. Contact designated GBU SH&E Contact — *Add name(s)/number(s)*
5. As required, contact client, any others — *Add name(s)/number(s)*

#2 – Medical Care

1. If after consulting with WorkCare, medical care is indicated, Supervisor (preferred) or designated alternate shall accompany the injured employee or follow to medical provider (Also, see #3 below)
2. Provide the Order for Treatment Forms to the medical provider at the time of the initial evaluation
3. Inform medical provider that temporary light/alternate duty is available
4. Obtain work status note from injured employee after each and every re-evaluation
   a. Provide copy to WC Claims Manager
   b. During recovery, identify temporary light-duty or alternate assignments necessary to accommodate injured employee's return to work based on work restrictions outlined by the medical provider

#3 - Post Accident Drug/Alcohol Screen

Not Applicable

Parsons does not have a companywide mandated post accident substance screen/policy. It is the responsibility of our projects to know whether or not their project requires such and if so, the project must set-up post accident drug screen process/protocol thru TM with their designated occupational clinic and at the time of an employee's initial evaluation for a work related injury/illness, request that the medical provider perform this screen.

#4 – Reports/Investigation/Follow-up Activities

1. Complete IndustrySafe Online Incident Report within (4) hours
2. Complete WC Accident reports and submit to WC Analyst
3. Complete any/other required project or client specific injury/accident forms
4. Take active role in root cause accident investigation. Take corrective actions. Contact BU SH&E Director re: your role in the investigation
5. Consult with BU SH&E Director to make OSHA recordability determination
6. Maintain ongoing contact with the injured employee during his/her recovery
7. Complete final investigation report in IndustrySafe within (72) hours
8. Immediately notify WC Claims Manager & TM if employee misses time from work

Project/Office Designated WC Medical Providers

Compile and post at jobsite your Project/Offices' Designated WC Medical Clinic and Hospital information as well as map from site to each and note that unless state rules specifically prohibit, Parsons directs our injured employees to our predesignated occupational medical facilities when a work-related injury occurs. Contact Parsons WC Claims Manager for information about the wc provisions in your state and for list of wc network medical providers.

PARSONS

__________________________ _______________________________ of Parsons Corporation
(Employee Name) (Occupation)

is authorized to go to ____ for the following service(s):
(Name of Medical Provider)

Treatment for a Work-Related Injury/Illness for Date of Injury: ______________________.

In the event the above medical provider determines this injury or condition NOT TO BE WORK RELATED, the employee and Parsons understand that this employee may then be referred by the above medical provider to his/her personal medical doctor.

Employer Information:	Parsons Corporation 100 West Walnut Street Pasadena, CA 91124
Workers' compensation carrier:	**Insurance Information:** WC Carrier: AIG (Except for the monopolistic states), underwritten by: CA - American Home Assurance Company; All other states/FL/MA/WI: Insurance Company of the State of Pennsylvania WC policies, effective 1/1/19-1/1/20: All other states: WC014629641; California: WC014629640; Florida: WC014629639; MA/WI: WC014629638
Adjusting Office and Telephone No.:	Call AIG for address as varies by state
	(877) 802-5246

Comments to Provider: Parsons attempts to provide any modified, alternate, light duty recommended.

____

____

__________________________ __________________________ ________________
Authorized Employer Signature Print Name Date

661-904-0978 866-293-0114
Phone Number Fax Number

Disability slips and return-to-work notifications: Immediately fax to Parsons ***and*** provide copy to employee at conclusion of every evaluation/treatment.

Attention Emergency Department: After acute care, please refer patient back to a
_______________________________________ for follow-up treatment.
(Medical provider—to be completed by Parsons—where permitted by law.)

- Parsons uses WorkCare as our Corporate Medical Director and Occupational Health Consultant. Parsons is committed to the health and well-being of its employees. Work Care's role is to ensure that Parsons employees receive timely, appropriate, high-quality medical care and that necessary work restrictions are accommodated.

- WorkCare must be contacted when a Parsons employee comes to the clinic, prior to treatment in all non-emergency cases. WorkCare will make every effort to also call the clinic prior to the employee's arrival. If you have not been contacted by WorkCare, please call 1-888-449-7787 and identify what clinic you are from, the nature of your concern, and ask to speak to a WorkCare clinician.

- Please note that Parsons expects WorkCare to assist in the process of developing a course of treatment.

- Please also note that you may receive calls from both Parsons and WorkCare.

- A "Doctor's Work Status Report" form is attached so that you can make recommendations regarding the injured employee's work capacity. The medical provider's role is to identify any activity restrictions that will allow the injured body part to heal. These activity restrictions should be adhered to 24/7. Parsons responsibility is to determine what work can be done safely with these activity restrictions. Parsons is committed to providing temporary modified duty (transitional work) for those employees who are unable to return to work on full duty. **WorkCare requests that Parsons employees return-to-work unless their injury is so severe that they are confined to bed rest with no activity permitted.**

- Parsons is also committed to reducing OSHA recordable injuries. We request that you keep these OSHA recordability guidelines in mind when treating Parsons employees. We are not in any way encouraging under treatment of employees but at the same time, over treatment should be avoided. For example, use of steri-strips instead of sutures is preferred if such treatment is proper for a given laceration. Use of over-the-counter (OTC) medications at OTC dosages is also preferred if deemed adequate for treatment. Provide prescription level medication to employees if it is required for proper medical treatment

- IMMEDIATELY upon conclusion of EVERY medical evaluation (initial and all follow-up evaluations), place phone call and/or email and/or fax to Donna Miller to provide diagnosis and return-to-work restrictions. Also, provide copy to injured worker.

- WorkCare is available 24/7, 365 days a year at: 1-888-449-7787

- Parsons Workers' Compensation Analyst
  Donna P. Miller
  Office Telephone No. and Cell No.: (661) 904-0978
  Fax No.: (866) 293-0114
  100 West Walnut Street
  Pasadena, CA 91124
  Email: donna.miller@parsons.com

Doctor's Work Status Report

◆ **Please Fax to Donna Miller (866) 293-0114 and Provide Copy to Employee** ◆

Note: Job duties assigned to this employee will match the capabilities you define.

Employee Name:	**Claim Number:**		
Diagnosis:	**Date of Injury:**	____/____/_____ **(mm / dd /yyyy)**	

RETURN TO WORK STATUS

☐ May return to regular work (Date): / /
☐ Released to full duty with intention given not to aggravate injury (Date): / /
☐ May return to modified work (Date): / /
☐ May not return to work until (Estimated Date): / /
Estimated Duration of Modified Work:

PHYSICAL LIMITATIONS: I certify the employee can perform duties within the capabilities defined as follows:

☐ **Without any restrictions.**

OTE: In terms of an 8-hour workday, Occas. (Occasionally) equals 1–33%; Freq. (Frequently) equals 34–66%; Contin. (Continuously) equals 67–100%

Capabilities	Never	Occas.	Freq.	Contin.	Lifting\Carrying	Never	Occas.	Freq.	Contin.
Bend	☐	☐	☐	☐	0–5 lbs.	☐	☐	☐	☐
Squat	☐	☐	☐	☐	6–10 lbs.	☐	☐	☐	☐
Crawl	☐	☐	☐	☐	11–20 lbs.	☐	☐	☐	☐
Reach above shoulders	☐	☐	☐	☐	21–25 lbs.	☐	☐	☐	☐
Kneel	☐	☐	☐	☐	26–50 lbs.	☐	☐	☐	☐
Stoop	☐	☐	☐	☐	51–100 lbs.	☐	☐	☐	☐
Climb stairs, steps and step stools	☐	☐	☐	☐	Repeated push/pull	☐	☐	☐	☐
Climb ladders	☐	☐	☐	☐	Repeated simple grasp	☐	☐	☐	☐
Walk on uneven ground	☐	☐	☐	☐	Repeated fine manipulation	☐	☐	☐	☐
Other (Specify):	☐	☐	☐	☐	Other (Specify):	☐	☐	☐	☐

Restrictions of Activities	None	Mild	Moderate	Total	Comments
Unprotected heights	☐	☐	☐	☐	
Be around moving machinery	☐	☐	☐	☐	
Exposure to changes in temperature and humidity	☐	☐	☐	☐	
Driving automotive equipment	☐	☐	☐	☐	
Exposure to dust, fumes, and gases	☐	☐	☐	☐	

In an 8-hour workday, Worker can: (CHECK full capacity for each activity)

Total at One Time (Hours)											**Total During Entire 8-Hour Day (Hours)**										
Hours	**0**	**1/2**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Hours**	**0**	**1/2**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Sit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Sit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Stand	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Stand	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Walk	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	Walk	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

☐ Job duties were explained to me by (Name/Title): On (Date): / /
☐ I have received a written list of job tasks.
☐ I have **NOT** received a written list of job tasks, **BUT I AGREE THAT DUTIES MAY BE ASSIGNED AND/OR CHANGED, SO LONG AS THEY MATCH THE LIMITS DEFINED BY ME ABOVE**. ☐ No ☐ Yes

PROGNOSIS

Permanent Restrictions Likely? ☐ No ☐ Yes ☐ Unknown at this time
Medically Stationary? ☐ No ☐ Yes Date: / /

Physician Name (PRINT):	**Telephone No.:**
Signature:	**Date: / /**

APPENDIX I

COVID-19 PROTOCOLS AND PROCEDURES

Note:
COVID-19 Guidelines and Protocols are constantly changing and should be reviewed to make sure current Guidelines and Protocols are being followed.

PARSONS

COVID-19 Management Plan
[Put in NYSDEC Project Site]

Purpose

This document provides guidance to reduce the potential for contracting or spreading Coronavirus Disease 2019 (COVID-19) and will be updated following any issued change(s) in federal, state, or local health agency guidance or as needed to address changes in scheduled site work.

Document Version

This document was prepared consistent with the requirements of NYSDEC Specification 01 35 33 – COVID 19 Risk Management, Revision 0 issued April 7, 2020. Below is the version history for the COVID-19 Management Plan developed for the [Put in NYSDEC Project Site].

Revision 0: Original version, issued April 22, 2020.

Project Location and Description

[Put the project location, scope of work, and schedule of work activities]

Project Team

Multiple contractors will be on-site to implement and/or oversee each task. A list of key team members, their company and contact information are provided below.

New York State Department of Environmental Conservation (NYSDEC):

- Project Manager: [Put in Project Manager name and telephone number]

Property Owners:

[Put in applicable information (i.e. owner(s) name, address, e-mail address, and telephone number]

Remedial Action and/or Investigation Activities Oversight Contact: Parsons

- Project Manager: [Put in name, e-mail, and telephone number]
- Construction Manager: [Put in name, e-mail, and telephone number; if applicable]
- Technical Director: [Put in name, e-mail, and telephone number; if applicable]

Remedial Action and/or Investigation Activities Contractor: [Put in contractor name(s)]

- Project Manager: [Put in name, e-mail, and telephone number]
- Case Manager: [Put in name, e-mail, and telephone number; if applicable]
- Subcontractors:
  - TBD: [Put in all subcontractors working on project and general duties]
    - [Put in name of Project Manager, e-mail, and telephone number]

COVID-19 Management Plan
[Put in NYSDEC Project Site]

Local Health Department

The project site is located in [Put in county that work is being performed in]. Contact information for the local health department is listed below.

[Put in local health department contact information]

As of the date this plan was prepared, there are no local COVID-19 testing sites [Revise this statement if new information indicates differently]. As an alternative, the local health department recommends all COVID testing be coordinated through primary care physicians. In the event, a worker develops symptoms they are instructed to call their primary care provider for further instructions. Additionally, the local health department advised of online resources for "virtual walk-ins" in the immediate project area. Contact information is provided below.

FACILITY: [Put in online resources facility information (i.e. telephone number and weblink]

Potential Exposure Pathways, Risks and Symptoms

COVID-19 spreads mainly between people who are in close contact with one another (within about 6 feet) through respiratory droplets produced when an infected person coughs or sneezes. COVID-19 can also be transmitted by touching a surface or object that has the virus on it and then touching one's own mouth, nose, or possibly eyes, but this is not thought to be the main way the virus spreads. Risk of infection for the virus that causes COVID-19 is higher for people who are close contacts of someone known to have COVID-19 and those who live in or have recently been in an area with ongoing spread of COVID-19. Patients with COVID-19 have had mild to severe respiratory illness with symptoms of fever, cough, shortness of breath, difficulty breathing, chills, repeated shaking with chills, muscle pain, headache, sore throat, and new loss of taste and smell. These symptoms may reveal themselves 2 to 14 days after exposure to the virus.

Exposure Mitigation

Exposure mitigation will be managed at the Site by first implementing administrative controls and then by using personal protective equipment (PPE) as described below. A visual reminder is included in ***Attachment 1***, as well.

Administrative Controls:

- Dedicated staffing will be used by all on-site contractors and Parsons to the extent practical to reinforce this control among all work groups in all work zones.
- Ensure on-site personnel are effectively isolated from COVID-19 exposure when possible utilizing social distancing. Social distancing means contractors and Parsons employees are able to maintain a distance of 6 feet between people.
- Tailgate meetings will be held each morning with all on-site contractors and stakeholders to review scheduled activities and to evaluate whether tasks can be completed using social distancing. Markers (e.g., tape, cones, spray paint markings, etc.) will be placed on the ground at each designated work location six feet apart. If the task can be completed safely, work may

resume as planned. If social distancing can't be maintained, personal protective equipment (PPE, face coverings) is required.

- Since there is no running water at the site [Update if site has running and mention hand-washing protocols per CDC], contractors and Parsons employees will use an alcohol-based hand rub that contains at least 60% alcohol frequently throughout the day, but particularly after going to the bathroom, before/after eating, after blowing nose/coughing/sneezing in hands, and arriving/departing from the Site.
- Contractors and Parsons employees should avoid touching their eyes, nose, or mouth with unwashed hands.
- Avoid handshakes.
- Cough and sneeze into your elbow. If you use a tissue to blow your nose, dispose of the tissue promptly and use hand sanitizer to cleanse your hands.
- Utilize disinfectants from the EPA list (https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2) by wiping down surfaces you touch prior to starting work and routinely throughout the day, including shared vehicles as appropriate.
- Clean and disinfect all supplies (pens, clipboards, etc.), tablets, cellphones, reusable equipment (meters, pumps, etc.), and non-disposable PPE (hardhats, safety glasses, earmuffs) at the end of each day. Avoid using other employee's phones and personal work items, when possible.
- Do not come to work if you are sick or exhibiting any symptoms of COVID-19. Symptomatic employees will not be allowed to enter the Site, no exceptions. If a person comes to the site sick, isolate them, and send them home.
- All on-site workers must complete COVD-19 awareness training before being allowed to work on-site.

Personal Protective Equipment (PPE):

- Where social distancing guidelines (staying 6 feet apart) cannot be adhered to, an appropriate face covering must be worn at the Site.
- Every contractor and Parsons employee entering the site must have a face covering available for use or entry may be refused.

Community Safety

[Put in applicable information]

- Scope of work to be performed around structures and public.
  (See example below)

Example:

Proposed construction of the horizontal SVE system and repairs to monitoring wells will take place across three properties: 2, 6 and 7 Badger Avenue. All three of these properties are associated with active businesses. The property where contractors are most likely to cross-paths with the public/ community are associated with 2 Badger Avenue. This property is a bottle redemption facility and is open to the public

Monday through Saturday, 9:00 am to 5:00 pm. Employees of this facility may work extended hours. It is not uncommon to see employees of this facility entering/exiting the building and loading trucks located in the street between 2 and 7 Badger Avenue. Customers of this facility often park just outside the building while they unload their bottles/cans.

Construction work planned in and around this building will primarily occur outside. Contractors may need to enter this building during the geophysical investigation to facilitate the location of subsurface utilities prior to commencing intrusive work. Contractors may also need to enter this building during horizontal drilling to confirm the position of the drilling sonde. Exposure mitigation techniques, as described in this plan, will be implemented to minimize potential exposure pathways between the construction team and the bottle redemption facility employees and customers.

For 7 Badger Avenue, the exposure to the public is minimal and may be limited to a truck driver pulling in/out of this property. Additionally, there may be limited interaction during repair to monitoring well HRP-MW-10 as this well is located in a public parking area associated with an apartment complex to the east of 7 Badger Avenue. Public interaction on 6 Badger Avenue property will also be minimal, especially on the west side of 2 Badger Avenue. There may be a higher chance of interaction to the south of 2 Badger Avenue as customers or employees of the bottle redemption facility may park in this area. Construction work associated with these properties will occur outside only. No inside work is planned.

Site Access Control

[Put in applicable information]

- (See example below)

Example:

Badger Avenue is a dead-end road. A chain link fence borders the site to the north. The site is bordered to the east and west by 2 and 7 Badger Avenue buildings. The site is open to the south. The parking area along the fence line that makes-up the southern boundary of the 7 Badger Avenue site will be the control center for the Site (see Figure 2). This location has been selected because it is out of traffic flow associated with active businesses in this area.

All personnel associated with the remedial action construction entering or leaving the site, will be required to check-in with Parsons Construction Manager and complete a Self-Declaration Questionnaire (SDQ) included as Attachment 2. Parsons will submit a copy of each SDG to NYSDEC with the Daily Inspection Report.

Personnel reporting for work must line up a minimum of 6 feet apart prior to being assessed. Spray paint or other markers will be placed in this area to facilitate social distancing requirements. Parsons Construction Manager will distribute the SDQs as a means to pre-screen construction workers prior to accessing the site. The remedial action team is encouraged to self-monitor their body temperature at home prior to completing the SDQ when feasible. All workers must be assessed and cleared prior to entering the construction area each day. Parsons Construction Manager will also maintain an entry and exit log which will be signed by all personnel to prohibit access to the site by those that pose an elevated *risk of spreading COVID-19 (see Attachment 3). Parsons will submit a copy of the log to NYSDEC with the Daily Inspection Report. Site Access Restriction Posters will be posted at the control center for the site (See Attachment 4).*

Procedure if Personnel is Diagnosed

This section details the procedures in the event a member of the construction team is diagnosed with COVID-19, is suspected of having COVID-19 or has been in close proximity to someone who has contracted COVID-19.

1. If a contractor or a Parsons employee is sick/symptomatic, please stay home and do not return to work until you are well.
2. If a contractor's or a Parsons employee symptoms align to COVID-19 as described above, please seek medical attention for guidance.
3. Call 911 immediately, if someone develops any emergency warning signs/symptoms. Emergency symptoms may include trouble breathing, persistent pain or pressure in the chest, new confusion or inability to arouse and bluish lips or face. Notify the operator or Parsons Site Safety Officer the ill person has or may have, COVID-19. If possible, put on a cloth face covering before medical help arrives.
4. If a contractor or a Parsons employee has been in close proximity to someone who has contracted the virus, please stay home 14 days to ensure the worker is not sick/symptomatic before returning to work.

If a contractor or a Parsons employee has been diagnosed with COVID-19 and has stayed home (home isolated), this person can stop home isolation under the following conditions:

OPTION 1: If the contractor or a Parsons employee will not have a test to determine if they are still contagious, the contractor or a Parsons employee can leave home after these three things have happened: the person has had no fever for at least 72 hours (that is three full days of no fever without the use of medicine that reduces fevers) AND other symptoms have improved (for example, when the worker's cough or shortness of breath has improved) AND at least 7 days have passed since the worker's symptoms first appeared.

OPTION 2: If the contractor or a Parsons employee will be tested to determine if they are still contagious, the contractor or a Parsons employee can leave home after these three things have happened: the person no longer has a fever (without the use of medicine that reduces fevers) AND other symptoms have improved (for example, when the person's cough or shortness of breath have improved AND has received two negative tests in a row, 24 hours apart.

In all cases, contractors or Parsons employees should follow the guidance of their healthcare provider and local health department. The decision to stop home isolation should be made in consultation with their healthcare provider and state and local health departments.

Daily Cleaning Schedules and Disinfection Procedures

Common areas for this Site are limited to port-a-johns; there will be no field trailers/office space [Revise if site has field trailers and/or office space]. Common surfaces (e.g., port-a-john door handles, toilet paper roll covering, seats, etc.), community objects (pens, clipboards, field notebooks, tablets, etc.) and reusable equipment (meters, pumps, etc.) will be disinfected between users and/or at minimum once daily. Non-disposable PPE (hardhats, safety glasses, earmuffs, etc.), which are person specific will be disinfected/cleaned at the end of each day. All contractors and Parsons employees will make every effort to avoid using other personnel's phones and personal work items.

Contractors and Parsons employees will use disinfectants from the EPA list to do so (https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2). Labels contain instructions for safe and effective use of the product including precautions taken when applying the product, such as wearing gloves and using good ventilation during use of the product. Gloves should be discarded after each cleaning and disinfection. If available, contractors and Parsons should provide their staff with disposable disinfecting wipes to use on commonly used surfaces. Throw disinfecting wipes away after one use.

Hand sanitizer should be made available at common areas for employee use (e.g., in the port-a-john, support vehicles, heavy equipment, etc.). A copy of the World Health Organization Hand Rubbing poster will be posted near shared sanitizers (see Attachment 5).

In the event there is/are suspected COVID-19 cases among site personnel, work will stop. All site personnel will gather at pre-marked spaces, 6 feet apart at the site control center. A collaborative discussion amongst all site personnel will be used to identify where the person was working, surfaces encountered , etc. The cleaning and disinfection procedures identified above will be implemented.

Training

Each company must train their own employees at length with respect to COVID-19 and provide their employees with appropriate PPE including disinfectants, hand sanitizers, face coverings, etc. Parsons in collaboration with [Name of Contractors, if applicable] will provide general COVID-19 awareness training including a review of the contents of this plan and best management practices for completing each phase of work to all contractors and Parsons employees working at the Site. Employees who have completed the training will be required to sign the training form in Attachment 6. Parsons will submit a copy of the training log to NYSDEC with the Daily Inspection Report (see Attachment 7).

At a minimum, the following information and training will be provided:

1. Sources of exposure to the COVID-19.
2. The hazards associated with that exposure, and appropriate workplace protocols in place to prevent or reduce the likelihood of exposure.
3. Information regarding where employees can go to obtain more knowledge.

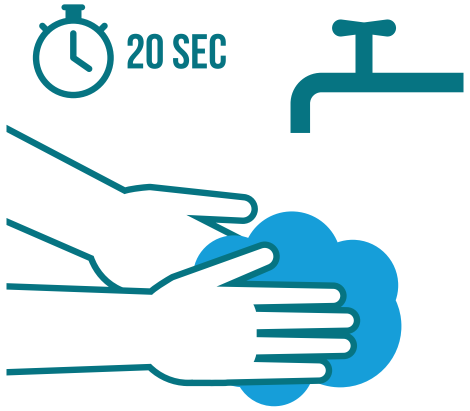
Supervisors must brief employees on any applicable updates to internal COVID-19 guidance during daily huddles/toolbox meetings before beginning work.

Note:

- **Additional information on COVID-19 is provided in Attachment 8.**

ATTACHMENT 1

PREVENT INFECTION



Wash your hands and use hand sanitizer

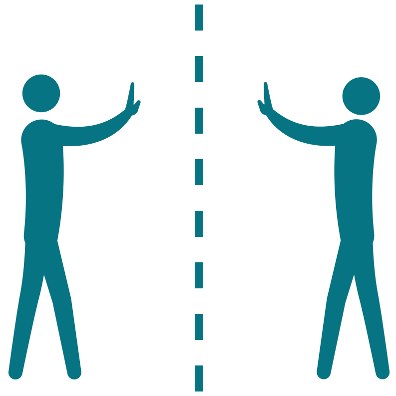
Wash your hands frequently and thoroughly, for a minimum of 20 seconds.

Use hand sanitizer, containing at least 60% alcohol when you are unable to wash you hands with soap and water.

Cover your cough or sneeze

Cover your mouth and nose when coughing or sneezing. Turn your head away from others, if possible, when sneezing.

Use a paper tissue or your sleeve and not your hand. Dispose of used tissues immediately.



Limit physical contact

Avoid handshakes, kisses and hugs.

Maintain at least 6 feet from all others persons when possible.

Keep clean

Regularly sanitize frequently touched and shared surfaces at home as well as at work.

Be considerate

Stay home whenever possible especially if you are experiencing symptoms.

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

ATTACHMENT 2

COVID-19 Self-Declaration Questionnaire

To prevent the spread of COVID-19 and reduce the potential risk of exposure to our employees and others, we are conducting a simple screening questionnaire. Your participation is important to help us take precautionary measures to protect you and everyone at your project location. Thank you for your time.

Name:	Contact Number:
Company/Organization:	Parsons POC:
Project Name:	City/State:

Self-Declaration

1. Have you returned from any of the Level 3 countries listed on the CDC website https://www.cdc.gov/coronavirus/2019-ncov/travelers/after-travel-precautions.html within the last 14 days? (Note as of 4/22/20: The current list recommends all non-essential international travel be avoided.)

   Yes No

2. Have you had close contact with or cared for someone diagnosed with COVID-19 within the last 14 days?

   Yes No

3. Have you been in close contact with anyone who has traveled within the last 14 days to one of the Level 3 countries listed on https://www.cdc.gov/coronavirus/2019-ncov/travelers/after-travel-precautions.html (Note as of 4/22/20: The current list recommends all non-essential international travel be avoided.)

   Yes No

4. Have you experienced any cold or flu-like symptoms in the last 14 days (including fever, cough, sore throat, respiratory illness, difficulty breathing)?

   Yes No

If the answer is “yes” to any of these questions, access to the field project location is not permitted.

Signature (visitor): ________________________________ Date: ______________

ATTACHMENT 3

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Entry/Exit Log with COVID-19 Acknowledgement

Project Name: ______________________________________

Project #: ____

New York State Department of Environmental Conservation's (DEC) objective is to provide a safe and healthy workplace. In response to COVID-19, DEC is prohibiting access to our work areas by those who pose an elevated risk of spreading COVID-19. By completing this site Entry/Exit log, you acknowledge your understanding of this policy and confirm that your health and travel history is NOT in one of the prohibited access groups listed below, and to the best of your knowledge, you do not pose an elevated risk of transmitting COVID-19 to others. Please leave the site immediately and follow recommendations from public health agencies and your healthcare provider if you fall into one of the prohibited access groups listed below:

- You are experiencing flu-like symptoms including but not limited to fever, chills, cough, sore throat, diarrhea, vomiting, runny/stuffy nose, muscle or body aches, headaches, fatigue.

- You have traveled to CDC-restricted destinations in the last 2 weeks including China, South Korea, Iran, United Kingdom & Ireland, all European Union countries, Switzerland and regions within the U.S. for which public health agencies have prohibited travel.

- You had direct contact with a person diagnosed with COVID-19 or suspected of having COVID-19 during the last 2 weeks.

Name	Initials	Affiliation	Date	Time In	Time Out

ATTACHMENT 4

SITE ACCESS RESTRICTIONS

SITE ACCESS IS PROHIBITED FOR THE FOLLOWING PERSONS DUE TO COVID-19 RISK

- **You are experiencing flu-like symptoms including but not limited to:**

  Fever or feeling feverish/chills, cough, sore throat, diarrhea, vomiting, runny or stuffy nose, muscle or body aches, headaches, fatigue (tiredness)

- **You have traveled to CDC-restricted destinations during the last 2 weeks:**

  China, South Korea, Iran, United Kingdom & Ireland, all European Union countries, Switzerland and regions within the U.S. for which public health agencies have prohibited travel

- **You had direct contact with a person diagnosed with COVID-19 or suspected of having COVID-19 during the last 2 weeks**

  Immediately notify NYSDEC site management.

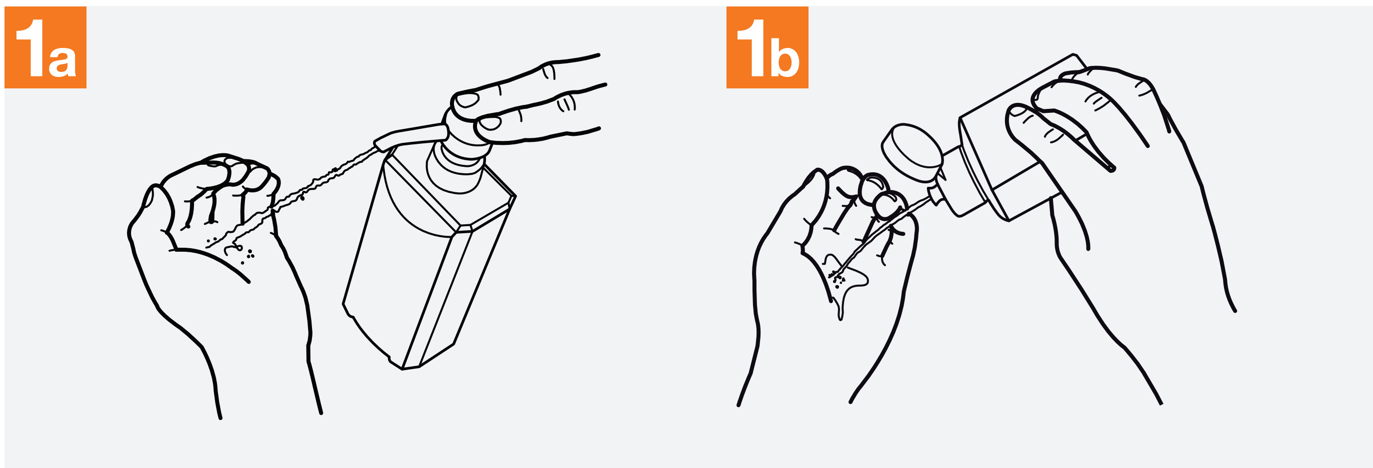
NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

ATTACHMENT 5

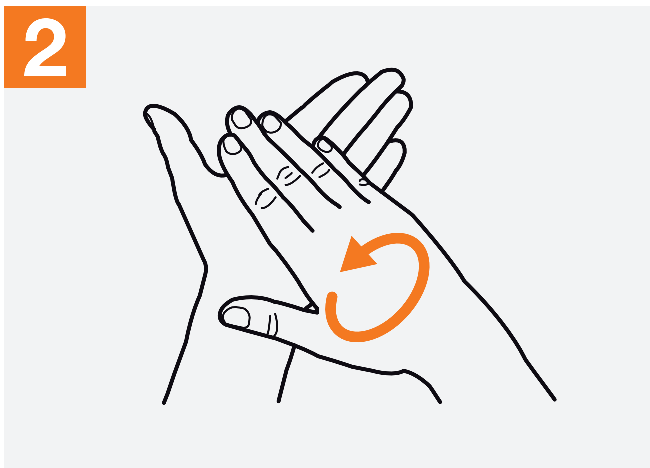
How to Handrub?

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

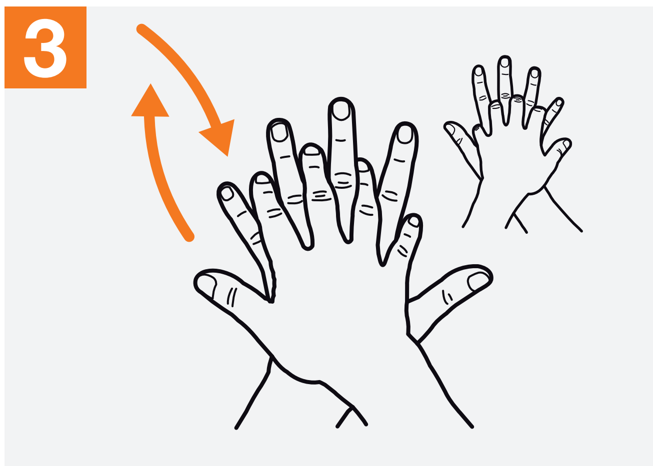
Duration of the entire procedure: 20-30 seconds



Apply a palmful of the product in a cupped hand, covering all surfaces;



Rub hands palm to palm;

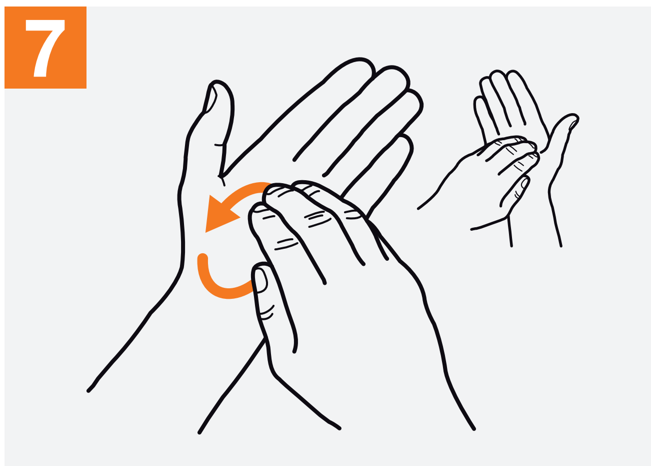


Right palm over left dorsum with interlaced fingers and vice versa;

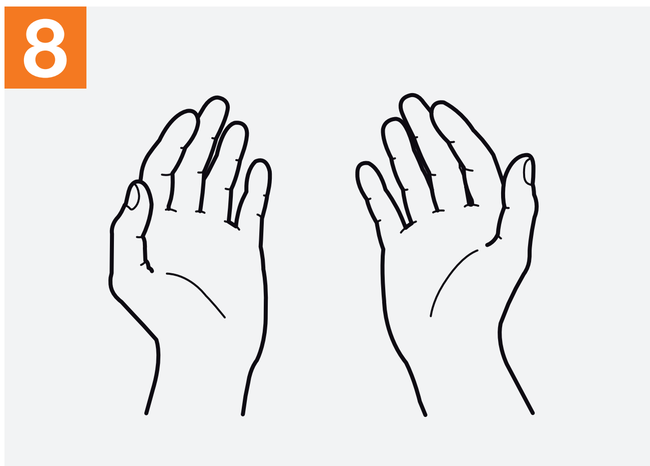
Palm to palm with fingers interlaced;

Backs of fingers to opposing palms with fingers interlocked;

Rotational rubbing of left thumb clasped in right palm and vice versa;



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



Once dry, your hands are safe.

World Health Organization

Patient Safety
A World Alliance for Safer Health Care

SAVE LIVES
Clean **Your** Hands

WHO acknowledges the Hôpitaux Universitaires de Genève (HUG), in particular the members of the Infection Control Programme, for their active participation in developing this material.

May 2009

ATTACHMENT 6

COVID-19 General Awareness Training Log

NYSDEC Project Site:

Name	Company	Phone	Email	Date Training Completed	Training Provided by

ATTACHMENT 7 - DAILY INSPECTION REPORT

Report No. **(Site Name) - NYSDEC Site No. ___________** Date: ________

NYSDEC Division of Environmental Remediation		PARSONS		**NYSDEC Contract No.** Superintendent: NYSDEC PM: Consultant PM: Consultant Site Inspectors:
Site Location:				
Weather Conditions				
General Description		AM		PM
Temperature		AM		PM
Wind		AM		PM

Health & Safety **If any box below is checked "Yes", provide explanation under "Health & Safety Comments".**			
Were there any changes to the Health & Safety Plan?	*Yes	No	NA
Were there any exceedances of the perimeter air monitoring reported on this date?	*Yes	No	NA
Were there any nuisance issues reported/observed on this date?	*Yes	No	NA
Health & Safety Comments			

Summary of Work Performed	Arrived at site:		Departed Site:	

Equipment/Material Tracking **If any box below is checked "Yes", provide explanation under "Material Tracking Comments".**			
Were there any vehicles which did not display proper D.O.T numbers and placards?	*Yes	No	NA
Were there any vehicles which were not tarped?	* Yes	No	NA
Were there any vehicles which were not decontaminated prior to exiting the work site?	* Yes	No	NA

Personnel and Equipment

Individual	Company	Trade	Total Hours

ATTACHMENT 7 - DAILY INSPECTION REPORT

Report No. ______ **(Site Name) - NYSDEC Site No. ___________**Date: _________

Equipment Description	Contractor/Vendor	Quantity	Used

Material Description	Imported/ Delivered to Site	Exported off Site	Waste Profile (If Applicable)	Source or Disposal Facility (If Applicable)	Daily Loads	Daily Weight (tons)*

*On-Site scale for off-site shipment, delivery ticket for material received

Equipment/Material Tracking Comments:

Visitors to Site

Name	Representing	Entered Exclusion/CRZ Zone	
		Yes	No
		Yes	No
		Yes	No
		Yes	No
		Yes	No
		Yes	No
		Yes	No
		Yes	No
		Yes	No

Site Representatives

Name	Representing

Project Schedule Comments

Issues Pending

Interaction with Public, Property Owners, Media, etc.

Include (insert) figures with markups showing location of work and job progress

Site Photographs (Descriptions Below)	

Comments

Site Inspector(s):	Date:

DAILY HEALTH CHECKLIST

Is social distancing being practiced?	Yes ☐	No ☐
Is the tail gate safety meeting held outdoors?	Yes ☐	No ☐
Are remote/call in job meetings being held in lieu of meeting in person where possible?	Yes ☐	No ☐
Were personal protective gloves, masks, and eye protection being used?	Yes ☐	No ☐
Are sanitizing wipes, wash stations or spray available?	Yes ☐	No ☐
Have any workers/visitors been excluded based on close contact with individuals diagnosed with COVID-19, have recently traveled to restricted areas or countries, or are symptomatic (fever, chills, cough/shortness of breath)?	Yes ☐	No ☐
Comments:		

REMEDIAL ACTIVITIES AT PROPERTIES

1. Have anyone at this location been tested and confirmed to have COVID-19?	Yes ☐	No ☐
2. Is anyone at this location isolated or quarantined for COVID-19?	Yes ☐	No ☐
3. Has anyone at this locaton had contact with anyone known to have COVID-19 in the past 14 days?	Yes ☐	No ☐
4. Does anyone at this locaton have any symptoms of a respiratory infection (e.g., cough, sore throat, fever, or shortness of breath)?	Yes ☐	No ☐
5. Does the Department and its contractors have your permission to enter the property at this time?	Yes ☐	No ☐
If Yes to <u>any</u> of 1-4 above: • If it is <u>not</u> critical that service/entry be carried out immediately and can be postponed until the risk of COVID-19 is lower, or can be accomplished remotely/without entry, postpone or conduct service without entry. • If it <u>is</u> critical that service/entry be carried out immediately, advise occupants that as a precaution and for our own protection, project personnel will be donning appropriate PPE* (including respiratory protection) - and do so prior to entry.	Yes ☐	No ☐
Comments:		

NUISANCE CHECKLIST

Were there any community complaints related to work on this date?	Yes ☐	No ☐	N/A☐
Were there any odors detected on this date?	Yes ☐	No ☐	N/A☐
Was noise outside specification and/or above background on this date?	Yes ☐	No ☐	N/A☐
Were vibration readings outside specification and/or above background on this date?	Yes ☐	No ☐	N/A☐
Any visible dust observed beyond the work perimeter on this date?	Yes ☐	No ☐	N/A☐
Any visible contrast (turbidity) beyond engineering controls observed on this date?	Yes ☐	No ☐	N/A☐
Was turbidity checked at the Montauk Highway outfall?	AM ☐	PM ☐	N/A☐
Were any property owners NOT provided advance notice for work performed on this property on this date?	Yes ☐	No ☐	N/A☐
Was the temporary fabric structure closed at the end of the day?	Yes ☐	No ☐	N/A☐
Has Contractor failed to protect all foundations and structures adjacent to and adjoining the site which are affected by the excavations or other operations connected with performance of the Work?	Yes ☐	No ☐	N/A☐
If yes, has Contractor been notified?	Yes ☐	No ☐	N/A☐
Comments:			

ATTACHMENT 8

Appendix 8.1

PARSONS

OWN ZERO

Coronavirus Disease 2019 (COVID-19)

March 17, 2020

What is Coronavirus disease 2019?

Coronavirus disease 2019 (COVID-19) is a respiratory illness that can spread from person to person. The virus that causes COVID-19 is a novel coronavirus that was first identified during an investigation into an outbreak in Wuhan, China.

Can I get COVID-19?

Yes. COVID-19 is spreading from person to person in many parts of the world. Risk of infection from the virus that causes COVID-19 is higher for people who are close contacts of someone known to have COVID-19, for example healthcare workers, or household members. Other people at higher risk for infection are those who live in or have recently been in an area with ongoing spread of COVID-19.

How does COVID-19 spread?

The virus is thought to spread mainly between people who are in close contact with one another (within about 6 feet) through respiratory droplets produced when an infected person coughs or sneezes. It also may be possible that a person can get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes, but this is not thought to be the main way the virus spreads.

What are the symptoms of COVID-19?

Patients with COVID-19 have had mild to severe respiratory illness with symptoms of:

- fever
- cough
- shortness of breath
- pneumonia in both lungs and other severe complications

People can help protect themselves from respiratory illness with everyday preventive actions.

- Avoid close contact with people who are sick.
- Avoid touching your eyes, nose, and mouth with unwashed hands.
- Wash your hands often with soap and water for at least 20 seconds.
- Use an alcohol-based hand sanitizer that contains at least 60% alcohol if soap and water are not available.
- Practice social distancing –stay 6' away from other people. Avoid handshakes.

If you are sick, to keep from spreading respiratory illness to others, you should

- Stay home when you are sick.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash.
- Clean and disinfect frequently touched objects and surfaces.

What workplace guidance is available to help protect employees and prevent the spread of COVID-19?

- Employees are asked to review Parsons internal COVID-19 Crisis Response site and Company News Group updates for the latest directives on travel, working/returning to work and other relevant documents.
- A COVID-19 Prevention Procedure has been developed to offer additional field guidance covering personal hygiene practices, cleaning/sanitation, training and other relevant information.

Are there additional resources to learn more about COVID-19?

- Centers for Disease Control - Interim Guidance for Businesses and Employers (https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html).
- For hygiene and hand washing best practices, Centers for Disease Control COVID—19 How to Protect Yourself. (https://www.cdc.gov/coronavirus/2019-ncov/prepare/prevention.html).
- World Health Organization Hand Rubbing poster (https://www.who.int/gpsc/5may/How_To_HandRub_Poster.pdf)
- EPA list of disinfectants (https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2)

Appendix 8-2 - Business Travel COVID-19 Pandemic

Parsons Corporate Response Management Team (CRMT) is actively monitoring the outbreak caused by COVID-19 (coronavirus). Updates are being announced in the Company News Workplace group regularly as conditions change. This Appendix is intended to provide managers with additional information to help manage the crisis during business travel activities.

TRAVEL

All employees are advised to postpone all non-essential business travel, domestic or international, until further notice. This includes non-essential attendance at meetings, conferences, and events.

Essential Travel is defined as:

- Travel to and from client meetings when it is not feasible to conduct the meeting virtually or postpone the meeting.
- Travel required to prevent immediate impacts to the health and safety of the employee and family.
- Travel, that if postponed or cancelled, would cause material impacts to the financial, operational, business development, safety, reputational, legal or compliance status of Parsons.
- When in doubt about what is essential, contact your leadership team.

In general, COVID-19 is believed to be most commonly transmitted via person-to-person contact. There's certainly the chance of contracting the virus through contact with contaminated surfaces, but according to the CDC, this is "not thought to be the main way the virus spreads."

There are several great resources on the CDC and WHO websites about precautions we can take to stay healthy and limit exposure to COVID-19. Traveling employees are encouraged to take preventative actions to help stop the spread of germs:

- Wash hands frequently using soap and water.
- Use alcohol-based hand sanitizer frequently as recommended
- Avoid touching your eyes, nose, and mouth with an unwashed hand
- Wearing masks: Are you sick? If so, wearing a mask will protect others. If not, wearing a mask may or may not protect you. Masks are much more effective when placed on an infected person
- Practice social distancing when possible
- Avoid areas of known infection or interactions with known infected

Control Measures are provided in the table below to reduce the likelihood of infection during essential business travel.

Appendix 8-2 - Business Travel COVID-19 Pandemic

Table 1: Protection Against COVID-19 During Business Related Travel

ACTIVTY	HAZARD	CONTROL
Airline Travel	Transmission Through Person to Person Contact • Between people who are in close contact with one another (within about 6 feet). • Through respiratory droplets produced when an infected person coughs or sneezes. • Contact with Contaminated Surfaces and Objects	Airline travel is permitted if considered essential (see definition above) Employees are encouraged to wash their hands after passing through the security checkpoint and before eating or drinking Avoid touching your eyes, nose or mouth with unwashed hands Travel with disinfecting wipes if possible and clean frequently touched surfaces (tray table, armrest, and seatback display) If carrying hand sanitized, apply before takeoff and after disinfecting surfaces Avoid aisle seats as you are exposed to more passengers during the flight.
Staying in Hotels	Transmission Through Person to Person Contact • Between people who are in close contact with one another (within about 6 feet). • Through respiratory droplets produced when an infected person coughs or sneezes. • Contact with Contaminated Surfaces and Objects	Top tier and other hotel chains have established COVID-19 response plans for protecting guests. Employees should not stay in hotels or hotel chains in which a COVID-19 response plan has not been published Employees are encouraged to wash their hands immediately upon entering the room Travel with disinfecting wipes if possible and clean frequently touched surfaces in room (remote control, light switches, bedside lamp switches, the alarm clock, the phone, the bathroom sink) Remove the comforter to avoid potential contact with lingering bodily fluids that can harbor germs Employees are asked to practice social distancing when possible and should discuss accommodation options (e.g. kitchenette) with their manager prior to booking.
Carpooling (Parsons Vehicles)	Transmission Through Person to Person Contact • Between people who are in close contact with one another (within about 6 feet).	Carpooling in Parsons vehicles is permitted if travel is considered essential (see definition above). Carpooling or ridesharing with strangers or non-essential passengers *in Parsons vehicles* is prohibited. Don't carpool if you or other passengers are symptomatic (fever, cough, or shortness of breath) or have been in close proximity to someone who has contracted the virus within the last 14 days.

Appendix 8-2 - Business Travel COVID-19 Pandemic

ACTIVTY	HAZARD	CONTROL
Carpooling (Parsons Vehicles)	• Through respiratory droplets produced when an infected person coughs or sneezes. • Contact with Contaminated Surfaces and Objects	**<u>Regularly clean and disinfect your vehicle:</u>** • The steering wheel is constantly touched. They should be wiped down with a disinfectant wipe or spray daily. • Don't forget the exterior and interior door handles, your gear shifter, the climate control buttons and radio knobs or buttons, the rearview mirror, and your center console including the cupholders. • Look for specific wipes available made for cleaning your car's leather. • Use microfiber cloths to wipe down touchscreens. **<u>Things to keep in your vehicle:</u>** • Box of tissues along with a small trash bag to gather the used tissues. Empty it daily. • Hand sanitizer: According to the Centers for Disease Control, use a hand sanitizer that contains at least 60% alcohol. • Sanitary wipes or spray
Traveling to Remote Locations	Transmission Through Person to Person Contact • Between people who are in close contact with one another (within about 6 feet). • Through respiratory droplets produced when an infected person coughs or sneezes. • Contact with Contaminated Surfaces and Objects	Work in remote locations is permitted if travel is considered essential (see definition above). Employees should never perform remote field activities alone Ensure reasonable quantities of food, water, medicines and essentials in the event of travel restrictions, quarantine or limited local supplies. For field work, pack adequate supplies of disinfectants, sanitizing products, trash bags, and nitrile gloves. Disinfect equipment and shared tools before and after use Identify nearest healthcare providers along route and at designation to assist with any medical needs or severe sickness prior to trip Ensure availability and/or ability to use communication devices. Contact Parsons Global Hotline: 1-667-225-6153 for business travel emergencies

Appendix 9-3 – COVID-19 Self-Declaration Form

To prevent the spread of COVID-19 and reduce the potential risk of exposure to our employees and others, we are conducting a simple screening questionnaire. Your participation is important to help us take precautionary measures to protect you and everyone at your project location. Thank you for your time.

Name:	Contact Number:
Company/Organization:	Parsons POC:
Project Name:	City/State:

Self-Declaration

1. Have you returned from any of the Level 3 countries listed on the CDC website https://www.cdc.gov/coronavirus/2019-ncov/travelers/after-travel-precautions.html within the last 14 days?

   Yes No

2. Have you had close contact with or cared for someone diagnosed with COVID-19 within the last 14 days?

   Yes No

3. Have you been in close contact with anyone who has traveled within the last 14 days to one of the Level 3 countries listed on https://www.cdc.gov/coronavirus/2019-ncov/travelers/after-travel-precautions.html .

   Yes No

4. Have you experienced any cold or flu-like symptoms in the last 14 days (including fever, cough, sore throat, respiratory illness, difficulty breathing)?

   Yes No

If the answer is "yes" to any of the following questions, access to the field project location is not permitted.

Signature (visitor): ____ Date: ________________

1. Purpose

This document provides guidance to reduce the potential for contracting or spreading Coronavirus Disease 2019 (COVID-19).

2. Procedure

2.1. Parsons Corporate Response Managememt Team (CRMT) actively monitors the outbreak and impacts the COVID-19 may have on our employees and customers.

2.2. Project Managers are asked to refer to Parsons internal COVID-19 Crisis Responses site and Company News Group updates for the latest directives on travel, working/returning to work and other relevant documents/resources. Project Managers shall modify this procedure as updates are made to internal guidance.

2.3. Managers are encouraged to collaborate with customers, subcontractors, and partners on crisis guidelines and contingency/preparedness plans. Our customers, subcontractors, and partners may provide different guidelines to their employees, ultimately impacting Parsons employees. In cases where local site guidelines are stricter, the strictest will apply.

2.4. The potential exposure to COVID-19 will be incorporated into each project's risk register, risk planning meetings and mitigation documents, as appropriate.

2.5. Exposure mitigations will be based on the hierarchy of controls with PPE serving as the last line of protection.

2.5.1. **Elimination:** We must eliminate all non-critical path work until further notice.

2.5.2. **Administrative Control**: We must ensure that our people are effectively isolated from COVID-19 exposure when possible utilizing social distancing and perimeter barricading. Symptomatic employees must not be allowed to enter the work zone with no exceptions.

2.5.3. **Administrative control:** All employees must be required to frequently wash and disinfect their hands per CDC guidelines. This will require dedicated staffing to reinforce this control among all work groups in all work zones.

2.5.4. **Administrative control:** All common areas, breakrooms, restrooms, and working surfaces used by Parsons employees must be cleaned and disinfected per CDC guidelines. Each project should establish their own sanitation schedule based upon usuage but no less than daily.

2.5.5. **Administrative Control:** All onsite workers must complete COVID-19 awareness training before being allowed to work on site.

2.5.6. **Administrative Control:** Breaks and lunches can be staggered in order to minimize employee contact and interaction. Site specific guidelines must implemented to ensure that guidelines related to social distancing, handwashing and sanitation are adhered to.

2.5.7. **PPE:** Where social distancing guidelines, general hygiene and surface sanitation practices cannot be adhered to then appropriate respiratory protection must be provided and worn. Additionally, workers and worksite visitors must always wear medical grade gloves. All OSHA requirements related to the use of respiratory protection training (e.g. training, fit testing, medical screening, etc.) must be followed.

2.6. For additional information, please refer to the Centers for Disease Control - Interim Guidance for Businesses and Employers (https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html).

3. Personal Hygiene

3.1. Frequently wash your hands with soap and water for at least 20 seconds and always before/after eating and arriving/departing the site.

3.2. If soap and running water are not available, use an alcohol-based hand rub that contains at least 60% alcohol.

3.3. Avoid touching your eyes, nose, or mouth with unwashed hand.

3.4. Use respiratory etiquette, including covering coughs and sneezes. Wash hands or use hand sanitizer after each time you cough or sneeze.

3.5. Minimize contact among employees, contractors, and other stakeholders by replacing face-to-face meetings with virtual communications and implementing telework if feasible.

3.6. Utilize disinfectants from the EPA list (https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2) by wiping down surfaces you touch prior to starting work and routinely throughout the day, including shared vehicles as appropriate.

3.7. Clean and disinfect all supplies (pens, clipboards, etc.), tablets, cellphones, reusable equipment (meters, pumps, etc.), and non-disposable PPE (hardhats, safety glasses, earmuffs) at the end of each day. Avoid using other employee's phones and personal work items, when possible.

3.8. Practice social distancing –stay 6' away from other people. Avoid handshakes.

3.9. Do not come to work if you are sick or exhibiting any symptoms of COVID-19. Refer to internal COVID-19 site for additional guidance on returning to work.

3.10. If another person on site does come into work or to the site sick, isolate them, and send them home, if Parsons is the controlling employer. If Parsons is not the controlling employer, isolate employees from the person, and inform the controlling employer accordingly.

3.11. For additional guidance on hygiene and hand washing best practices, please refer to the Centers for Disease Control COVID—19 How to Protect Yourself (https://www.cdc.gov/coronavirus/2019-ncov/prepare/prevention.html).

4. Field Trailer Cleaning/Sanitation

The following steps should be taken if site employees are utilizing common areas for meetings and breaks.

4.1. Each Parsons managed location must designate responsible person(s) for cleaning all common areas within a field trailer. This includes tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks.

4.2. If Parsons employees have work areas in a shared field trailer controlled by others, obtain information from controlling employer on sanitation practices.

4.3. To clean common areas, use disinfectants found on the EPA list.

4.4. Labels contain instructions for safe and effective use of the product including precautions taken when applying the product, such as wearing gloves (Personal Protective Equipment) and using good ventilation during use of the product. Gloves should be discarded after each cleaning and disinfection.

4.5. Provide disposable disinfecting wipes for staff to use on commonly used surfaces (for example, keyboards, desks, etc.), which can be wiped down by staff at their own workstations. Throw disinfecting wipes away after one use.

4.6. Have hand sanitizer available at common areas for employee use. Post the World Health Organization Hand Rubbing poster (https://www.who.int/gpsc/5may/How_To_HandRub_Poster.pdf) near shared sanitizers.

5. Screening Employees – Pandemic Conditions

Parsons may encounter Customer requests or higher risk field locations (e.g. craft projects, multi-employer) that require additional steps to support the separation of symptomatic employees from the healthy population. The objective is to reduce risk and potential COVID-19 exposures to those entering the facility and/or field location.

5.1. Self-declaration questionnaires (See Appenix 9.3) can be used as a means to pre-screen employees prior to accessing a locations point of entry. **Note:** Project Managers may need to update this questionnaire as local conditions and requirements change (e.g. updates to Customer quarantine requirements). Any changes to the self-declaration questionnaire must be cleared by Parsons Legal. Employees are encouraged to self-monitor their body temperature at home prior to completing the self-declaratiion questionnaire when feasible.

5.2. Onsite temperature screenings are permitted under the following conditions:

5.2.1. The agent conducting the screening has a health service background with the requisite training, equipment, and knowledge necessary to effectively assess worker suitability to enter the work zone. For Parsons controlled sites, this will require contracting through a local health service provider.

5.2.2. A visible barricade has been established around the perimeter of all Parsons work areas to ensure that no "non-cleared" personnel enter these work zones at any time. Cleared personnel are those who have been assessed as asymptomatic for COVID-19 infection by an agent who has been expressly trained to recognize and test persons for symptoms.

5.2.3. All workers must be assessed and cleared prior to entering these work zones.

5.2.4. Workers must line up a minimum of 6 ft. apart in advance of these work zones prior to being assessed.

6. Training

6.1. COVID-19 awareness training is included on the project training matrix. Subcontractors must train their own employees.

6.2. At a minimum, the following information and training is provided:

6.2.1. Sources of exposure to the COVID-19

6.2.2. The hazards associated with that exposure, and appropriate workplace protocols in place to prevent or reduce the likelihood of exposure

6.2.3. Information regarding where employees can go to obtain more knowledge

Project Managers can utilize Appendix 9.1 COVID-19 Factsheet to assist with employee awareness training.

6.3. Supervisors must brief employees on any applicable updates to internal COVID-19 guidance during daily huddles/toolbox meetings before beginning work.

6.4. Using an acceptable training form, the records custodian maintains a record of all training or instruction given to employees.

7. Responsibilities

7.1. **Corporate SH&E:** Responsible for developing and maintaining this procedure and conducting periodic reviews and updates to ensure alignment and integration with related or referenced policies and procedure; support and guidance to help ensure the success of this procedure; and auditing its effectiveness.

7.2. **Project Manager (PM):** Ultimately responsible for delivering the project and assigning roles and responsibilities to discipline managers and the Project Management Team; implementing and enforcing this procedure, and designating a records custodian for the project.

7.3. **Records Custodian:** Responsible for documenting and maintaining employee training.

7.4. **Subcontractor:** Complies with all Parsons' requirements. Submit subcontractor COVID-19 preparedness documentation. Trains subcontractor employees.

8. Exceptions

8.1. The Project Mananger may request or require a more stringent process if required by the contract or is beneficial to the project.

9. Appendices

9.1. COVID-19 Factsheet

9.2. Business Travel COVID-19 Pandemic

9.3. COVID 19 Self-declaration Form

Revision History

Revision	Changes	Approver	Approval Date
0	Original Issue	Barker, John	3/20/2020
1	Added Section 2.5 and Section 5. Added Appendix 9.2 and 9.3	Barker, John	3/31/2020

Appendix 9.1

PARSONS

OWN ZERO

Coronavirus Disease 2019 (COVID-19)

What is Coronavirus disease 2019?

Coronavirus disease 2019 (COVID-19) is a respiratory illness that can spread from person to person. The virus that causes COVID-19 is a novel coronavirus that was first identified during an investigation into an outbreak in Wuhan, China.

Can I get COVID-19?

Yes. COVID-19 is spreading from person to person in many parts of the world. Risk of infection from the virus that causes COVID-19 is higher for people who are close contacts of someone known to have COVID-19, for example healthcare workers, or household members. Other people at higher risk for infection are those who live in or have recently been in an area with ongoing spread of COVID-19.

How does COVID-19 spread?

The virus is thought to spread mainly between people who are in close contact with one another (within about 6 feet) through respiratory droplets produced when an infected person coughs or sneezes. It also may be possible that a person can get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes, but this is not thought to be the main way the virus spreads.

What are the symptoms of COVID-19?

Patients with COVID-19 have had mild to severe respiratory illness with symptoms of:

- fever
- cough
- shortness of breath
- pneumonia in both lungs and other severe complications

People can help protect themselves from respiratory illness with everyday preventive actions.

- Avoid close contact with people who are sick.
- Avoid touching your eyes, nose, and mouth with unwashed hands.
- Wash your hands often with soap and water for at least 20 seconds.
- Use an alcohol-based hand sanitizer that contains at least 60% alcohol if soap and water are not available.
- Practice social distancing –stay 6' away from other people. Avoid handshakes.

If you are sick, to keep from spreading respiratory illness to others, you should

- Stay home when you are sick.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash.
- Clean and disinfect frequently touched objects and surfaces.

What workplace guidance is available to help protect employees and prevent the spread of COVID-19?

- Employees are asked to review Parsons internal COVID-19 Crisis Response site and Company News Group updates for the latest directives on travel, working/returning to work and other relevant documents.
- A COVID-19 Prevention Procedure has been developed to offer additional field guidance covering personal hygiene practices, cleaning/sanitation, training and other relevant information.

Are there additional resources to learn more about COVID-19?

- Centers for Disease Control - Interim Guidance for Businesses and Employers (https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html).
- For hygiene and hand washing best practices, Centers for Disease Control COVID—19 How to Protect Yourself. (https://www.cdc.gov/coronavirus/2019-ncov/prepare/prevention.html).
- World Health Organization Hand Rubbing poster (https://www.who.int/gpsc/5may/How_To_HandRub_Poster.pdf)
- EPA list of disinfectants (https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2)

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In general, COVID-19 is believed to be most commonly transmitted via person-to-person contact. There's certainly the chance of contracting the virus through contact with contaminated surfaces, but according to the CDC, this is "not thought to be the main way the virus spreads."

There are several great resources on the CDC and WHO websites about precautions we can take to stay healthy and limit exposure to COVID-19. Traveling employees are encouraged to take preventative actions to help stop the spread of germs:

- Wash hands frequently using soap and water.
- Use alcohol-based hand sanitizer frequently as recommended
- **Avoid touching your eyes, nose, and mouth** with an unwashed hand
- Wearing masks: Are you sick? If so, wearing a mask will protect others. If not, wearing a mask may or may not protect you. Masks are much more effective when placed on an infected person
- Practice social distancing when possible
- Avoid areas of known infection or interactions with known infected

Control Measures are provided in the table below to reduce the likelihood of infection during essential business travel.

Table 1: Protection Against COVID-19 During Business Related Travel

ACTIVTY	HAZARD	CONTROL
Airline Travel	Transmission Through Person to Person Contact • Between people who are in close contact with one another (within about 6 feet). • Through respiratory droplets produced when an infected person coughs or sneezes. • Contact with Contaminated Surfaces and Objects	Airline travel is permitted if considered essential (see definition above) Employees are encouraged to wash their hands after passing through the security checkpoint and before eating or drinking Avoid touching your eyes, nose or mouth with unwashed hands Travel with disinfecting wipes if possible and clean frequently touched surfaces (tray table, armrest, and seatback display) If carrying hand sanitized, apply before takeoff and after disinfecting surfaces Avoid aisle seats as you are exposed to more passengers during the flight.
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Carpooling (Parsons Vehicles)	Transmission Through Person to Person Contact	Carpooling in Parsons vehicles is permitted if travel is considered essential (see definition above). Carpooling or ridesharing with strangers or non-essential passengers *in Parsons vehicles* is prohibited.

ACTIVTY	HAZARD	CONTROL
Carpooling (Parsons Vehicles)	• Between people who are in close contact with one another (within about 6 feet). • Through respiratory droplets produced when an infected person coughs or sneezes. • Contact with Contaminated Surfaces and Objects	Don't carpool if you or other passengers are symptomatic (fever, cough, or shortness of breath) or have been in close proximity to someone who has contracted the virus within the last 14 days. **<u>Regularly clean and disinfect your vehicle:</u>** • The steering wheel is constantly touched. They should be wiped down with a disinfectant wipe or spray daily. • Don't forget the exterior and interior door handles, your gear shifter, the climate control buttons and radio knobs or buttons, the rearview mirror, and your center console including the cupholders. • Look for specific wipes available made for cleaning your car's leather. • Use microfiber cloths to wipe down touchscreens. **<u>Things to keep in your vehicle:</u>** • Box of tissues along with a small trash bag to gather the used tissues. Empty it daily. • Hand sanitizer: According to the Centers for Disease Control, use a hand sanitizer that contains at least 60% alcohol. • Sanitary wipes or spray
Traveling to Remote Locations	Transmission Through Person to Person Contact • Between people who are in close contact with one another (within about 6 feet). • Through respiratory droplets produced when an infected person coughs or sneezes. • Contact with Contaminated Surfaces and Objects	Work in remote locations is permitted if travel is considered essential (see definition above). Employees should never perform remote field activities alone Ensure reasonable quantities of food, water, medicines and essentials in the event of travel restrictions, quarantine or limited local supplies. For field work, pack adequate supplies of disinfectants, sanitizing products, trash bags, and nitrile gloves. Disinfect equipment and shared tools before and after use Identify nearest healthcare providers along route and at designation to assist with any medical needs or severe sickness prior to trip Ensure availability and/or ability to use communication devices. Contact Parsons Global Hotline: 1-667-225-6153 for business travel emergencies

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Name:	Contact Number:
Company/Organization:	Parsons POC:
Project Name:	City/State:

Self-Declaration

1. Have you returned from any of the Level 3 countries listed on the CDC website https://www.cdc.gov/coronavirus/2019-ncov/travelers/after-travel-precautions.html within the last 14 days?

   Yes No

2. Have you had close contact with or cared for someone diagnosed with COVID-19 within the last 14 days?

   Yes No

3. Have you been in close contact with anyone who has traveled within the last 14 days to one of the Level 3 countries listed on https://www.cdc.gov/coronavirus/2019-ncov/travelers/after-travel-precautions.html .

   Yes No

4. Have you experienced any cold or flu-like symptoms in the last 14 days (including fever, cough, sore throat, respiratory illness, difficulty breathing)?

   Yes No

If the answer is "yes" to any of the following questions, access to the field project location is not permitted.

Signature (visitor): ____ Date: ________________

SECTION 01 35 33 – COVID-19 RISK MANAGEMENT

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes requirements for managing and minimizing the potential for transmission of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus, which causes the Novel Coronavirus Disease 2019 (COVID-19). COVID-19 typically causes respiratory illness in people.

B. Transmission: SARS-CoV-2 is currently known to spread via respiratory droplets produced when a person infected with the virus coughs or sneezes, the same way flu and other respiratory illnesses spread. SARS-CoV-2 can also be transmitted if people touch surfaces and objects with the virus on it.

C. Symptoms: COVID-19 can cause mild to severe respiratory illness with symptoms of fever, cough, and difficulty breathing. Preliminary information suggests older adults and people with underlying health conditions or compromised immune systems may be at higher risk of severe illness from this virus. Center for Disease Control (CDC) believes that symptoms of COVID-19 begin between 2 and 14 days after exposure.

D. Best Practices to Prevent Infection: Currently the best way identified to prevent infection is to minimize the potential of exposure to SARS-CoV-2. CDC recommends everyday actions to help prevent the spread of any respiratory viruses

- Wash your hands often with soap and water for at least 20 seconds. If soap and water are not available, use an alcohol-based hand sanitizer, containing at least 60% alcohol.
- Avoid touching your eyes, nose, and mouth with unwashed hands.
- Avoid close contact with people who are sick.
- Stay home when you are sick.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash can and wash hands or use hand sanitizer.
- Clean and disinfect frequently touched objects and surfaces.
- Wear face masks
- Safe social distancing (e.g., maintain a distance of 6 feet between people, limited group meetings)

1.2 OBJECTIVE

A. The objective of this specification is to minimize transmission and subsequent infections of COVID-19 in project staff that may arise as a result of exposure to SARS-CoV-2 released into the environment during construction and renovation activities. Controlling the dispersal of airborne infectious agents is critical to achieving this objective.

1.3 PERFORMANCE REQUIREMENTS AND RESPONSIBILITIES

A. The intent of this Section is to document and formalize the Contractor’s requirements for minimizing the risk of transmission of COVID-19 among site workers, project staff, and the surrounding community during construction per the latest recommendations of federal, state and local health agencies. This includes developing a COVID-19 Management Plan, establishing procedures for conducting onsite work activities to prevent virus transmission, monitoring staff health, and reporting requirements.

B. The Contractor is expected to communicate the requirements described in this section to all site workers, subcontractors, and visitors to the site daily, during daily Health and Safety meetings as well as through site postings (see attachment).

C. Contractors and their subcontractors are required at all times to guard the safety and health of all persons on and in the vicinity of the work site.

D. Contractors and their subcontractors are required to comply with all applicable rules, regulations, codes, and bulletins of the New York State Department of Labor and the standards imposed under the Federal Occupational Safety and Health Act of 1970, as amended ("OSHA").

E. Contractors and their subcontractors must comply with all City or State of New York safety requirements for projects within the City or State of New York constructed in accordance with the applicable building code.

F. Contractors and their subcontractors shall stay current and immediately implement the most up-to-date government issued practices to protect the safety and health of your employees, clients, and the general public.

1.4 RELATED SECTIONS

A. Section <INSERT APPLICABLE REFERENCE>, Contractor’s Health and Safety Plan

1.5 REFERENCES

A. Occupational Safety and Health Administration (OSHA) Guidance on Preparing Workplaces for COVID-19

B. New York State Department of Health

C. Centers for Disease Control and Prevention (CDC)

D. National Institute for Occupational Safety and Health (NIOSH)

E. Health Insurance Portability and Accountability Act (HIPAA)

1.6 SUBMITTALS

A. The Contractor shall prepare a COVID-19 Management Plan which can be a Supplement, or Addendum, to the Contractor’ Health and Safety Plan

B. The CONTRACTOR shall develop a one-page summary of site-specific practices for COVID-19 management and clearly display on site. Operating hours, delivery times, and extra considerations for works involving a high volume of personnel or potential for interaction with community members could also be included in the summary.

C. The Contractor's Daily Field Report shall include a Daily Health Checklist, with the following questions at a minimum:

DAILY HEALTH CHECKLIST

Is social distancing being practiced?	Yes ☐	No ☐
Is the tail gate safety meeting held outdoors?	Yes ☐	No ☐
Are remote/call-in job meetings being held in lieu of meeting in person where possible?	Yes ☐	No ☐
Were personal protective gloves, masks, and eye protection being used?	Yes ☐	No ☐
Are sanitizing wipes, wash stations or spray available?	Yes ☐	No ☐
Have any workers/visitors been excluded based on close contact with individuals diagnosed with COVID-19, have recently traveled to restricted areas or countries, or are symptomatic (fever, chills, cough/shortness of breath)?	Yes ☐	No ☐
Comments:		

1.7 COVID-19 MANAGEMENT PLAN

A. At a minimum, the COVID-19 Management Plan shall include:
1. Identification of potential exposure pathways and exposure risks associated with work tasks, e.g. activity hazard analysis (AHA).
2. Identification of local health department contact information and COVID-19 testing sites and procedures.
3. Detailed written description of the onsite personnel protection measures that will be utilized and a detailed explanation of how they will be implemented, monitored, and communicated.
4. Detailed written description of measures that will be taken to prevent transmission to or from the surrounding community and how they will be implemented and communicated.
5. Procedures to be followed in the event a site worker is diagnosed with or is suspected of having COVID-19, including identification of all personnel potentially exposed and isolation requirements.
6. Daily cleaning schedules and disinfection procedures per the most recent CDC guidelines.
7. Cleaning and disinfection procedures in the event there is/are suspected COVID-19 case(s) among site personnel.
8. Site access controls and entry/exit procedures.
9. Plan view of points of egress and delivery locations.

B. The COVID-19 Management Plan must be updated following any issued change(s) in federal, state, or local health agency guidance.

1.8 PRECONSTRUCTION CONFERENCE

A. Pre-Construction Conference shall include a review of methods and procedures related to COVID-19 risk management including, but not limited to the following:
1. Review of COVID-19 Management Plan

2. Review infection control procedures
3. Review staff monitoring and reporting requirements.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 RISK IDENTIFICATION

A. COVID-19 is a new disease; scientists and health agencies are continuously learning about how it spreads. The Contractor shall adjust site policies based on the most up to date government issued guidance regarding transmission.

B. Contractor shall confirm staff that have worked in locations where quarantine orders are in place, have met the minimum quarantine guidance and do not have symptoms prior to mobilizing to site.

C. Contractor shall monitor staff daily, including checking, and documenting, temperature with no contact infrared thermometer, to confirm onsite staff do not exhibit COVID-19 symptoms. Contractor shall provide daily reports of those tests upon NYSDEC's request.

3.2 RISK MINIMIZATION

A. Engineering Controls
1. Increasing ventilation rates of interior workspaces.
2. Access controls, including fences and locking gates.
3. Maintain 6 feet distances, using distance markers where appropriate in the field.

B. Administrative Controls
1. Continuous and effective communication of administrative controls/requirements to all site personnel and visitors, through the posting of site signage, preparation and distribution of site plans, presented during site meetings, and verbal warnings if necessary.
2. Require that all employees exhibiting any COVID-19 symptom do not enter the site and provide sick leave policies to support this requirement.
3. To minimize face-to-face interaction, the Site's Health & Safety Officer's (or other designated employee) phone number shall be prominently posted and disseminated to project staff to be called for the purpose of site sign in and sign out by all visitors to the site upon arrival and exit. The designated employee will receive entry and exit calls each day and will fill out the site entry/exit log for each site visitor to reduce traffic in site trailer and/or the number of individuals contacting the site access tracking log.
4. Staffing: only those employees necessary to complete critical path task(s) shall be present on-site at any given time. Work shall be scheduled to minimize the density of personnel in any given area at any given time.
5. Working Remotely; employees shall be encouraged to complete work remotely if possible.
6. Face-to-face meetings shall be replaced with video or phone conferences when practicable.

7. Social distancing shall be exercised for face-to-face meetings e.g. daily Health and Safety tailgate meeting. In addition, the Contractor shall plan to have multiple meetings (if necessary) to keep the number of participants to a threshold that allows for the practice of social distancing protocol. The Health and Safety officer will keep a record of all present for each meeting on the Health and Safety log.
8. Quarantine staff that have been in contact with a anyone that tested positive and notify NYSDEC immediately.

C. Safe Work Practices
1. The Contractor shall employ social distancing protocol for all onsite activities when able.
2. The Contractor provide PPE and adequate hand washing stations and hand sanitizer (containing a minimum of 60% alcohol) to allow site personnel and visitors to practice good personal hygiene.
3. The Contractor shall provide tissues, paper towels, no-touch trash cans, and disinfectants to maintain site cleanliness.
4. Sharing of tools and heavy equipment shall be limited to the extent practicable; handles of shared tools and equipment shall be sanitized regularly.

D. Personal Protective Equipment
1. Employees shall be provided disposable personal protective equipment (PPE), including gloves, goggles, face shields, face masks, and respiratory protection, as appropriate based on work environment and current recommendations by OSHA and CDC.
2. All PPE must be selected based on hazard to the worker, properly fitted and periodically refitted, consistently and properly worn when required, regularly inspected, maintained, and replaced, as necessary, and properly removed, cleaned, and stored or disposed of, to avoid contamination of self, others, or the environment.
3. PPE worn to prevent transmission of COVID-19 is not to be confused with PPE for protection against site contaminants.
4. PPE must be worn, removed, and disposed of correctly in order to remain effective.
    a. Face masks should fit snugly but comfortable against the side of the face and over the nose and be secured with ties or ear loops; cloth masks must include multiple layers of fabric, allow for breathing without restriction, and be able to be laundered and machine dried without damage.
    b. Face masks should be worn consistently and removed without touching eyes, nose, and mouth. An individual should wash their hands after handling a used face mask.
    c. Cloth face coverings should be sterilized by machine washing between use; disposable face masks shall be disposed of properly after using.
    d. Gloves are only effective if changed and disposed of frequently, to avoid cross-contamination.

3.3 NOTIFICATION OF POTENTIAL OR CONFIRMED INFECTION

A. The Contractor shall notify the Department immediately upon identification of a suspected or confirmed infection of COVID-19. This notification shall comply with HIPAA regulations.

B. The Contractor shall remove an individual suspected to have COVID-19 from the site immediately (to the individuals' hotel or local place of residence if transport home is not immediately feasible), as well as those who have worked in close contact with that individual for extended periods of time (an hour at a time or more) over the previous week. The individual with suspected infection shall contact their health care provider and/or follow local health department testing procedures and protocol.

C. While in the process of removing an employee exhibiting symptoms, steps should be taken to isolate the individual, place a surgical mask on the individual and inform the local health department and the NYSDEC.

D. In the event the individual with suspected infection cannot get home right away, they shall isolate in their hotel room (notifying hotel management of their symptoms), contact their health care provider, and/or follow local health department testing procedures and protocol.

E. In the absence of local health department information, the individual may call the New York State Hotline at 1-888-364-3065.

F. The Contractor shall maintain communication with potentially infected individual(s) and notify the Engineer upon receipt of COVID-19 test results.

G. Positively infected individuals may return to work at the site after 72 hours of being symptom-free and 7 days of isolation after the first symptoms appeared, or in accordance with the current federal, state, and local guidelines

H. OSHA recordkeeping requirements at 29 CFR Part 1904 mandate covered employers record certain work-related injuries and illnesses on their OSHA 300 log. COVID-19 can be a recordable illness if a worker is infected as a result of performing their work-related duties. However, employers are only responsible for recording cases of COVID-19 if all the following are met:

1. The case is a confirmed case of COVID-19 (see CDC information on persons under investigation and presumptive positive and laboratory-confirmed cases of COVID-19).

2. The case is work-related, as defined by 29 CFR 1904.5; and

3. The case involves one or more of the general recording criteria set forth in 29 CFR 1904.7 (e.g. medical treatment beyond first-aid, days away from work).

END OF SECTION

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APPENDIX C QUALITY ASSURANCE PROJECT PLAN

GENERIC QUALITY ASSURANCE PROJECT PLAN (QAPP)

NYSDEC WA #D009811

Prepared For:

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

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AUGUST 2020

REVIEWED AND APPROVED BY:

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Date

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FIXLIST OF ACRONYMS

Acronym	Definition
ASTM	American Society for Testing and Materials
BFB	4-Bromofluorobenzene
bgs	below ground surface
ºC	Degrees Celsius
CAR	Corrective Action Request
CCB	continuing calibration blanks
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
cis-1,2-DCE	cis-1,2-dichloroethene
CLP	Contract Laboratory Program
COC	Chain-of-Custody
CVOC	chlorinated volatile organic compound
1,1-DCE	1,1-dichloroethene
DER	Division of Environmental Remediation
DFTPP	decafluorotriphenylphosphine
DL	detection limit
DOT	Department of Transportation
DQO	Data Quality Objective
DUSR	Data Usability Summary Report
EDD	Electronic Data Deliverable
EIMS	Environmental Information Management System
ELAP	Environmental Laboratory Accreditation Program
FAP	Field Activities Plan
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectroscopy
ICB	initial calibration blanks
ICP	inductively coupled plasma
ICV	Initial Calibration Verification
IDL	Instrument Detection Limit
LCS	Laboratory Control Sample

LIMS	Laboratory Information Management System
LPM	Laboratory Project Manager
MD	Matrix Duplicate
MDL	method detection limit
µg/L	microgram per liter
mg/kg	milligram per kilogram
mL	milliliter
MS	matrix spike
MSA	Method of Standard Additions
MSB	matrix spike blank
MS/MSD	matrix spike/matrix spike duplicate
MSD	matrix spike duplicate
NCM	Nonconformance Memo
ng	Nanograms
NIST	National Institute of Standards and Technology
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PDI	photoionization detector
PE	performance evaluation
PFAS	polyfluoroalkyl substances
PFOA	perflourooctanoic acid
PID	photoionization detector
PMP	Project Management Plan
PPE	personal protective clothing
PRRL	Project Required Quantitation Limit
PSHEP	Project Safety, Health and Environment Plan
PQL	project quantitation limit
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAM	Quality Assurance Manual

QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference
RRF	relative response factors
SDG	Sample Delivery Group
SOP	Standard Operating Procedure
SVOC	Semivolatile Organic Compound
TCE	tetrachloroethene
TCL	Target Compound List
TIC	tentatively identified compounds
TOGS	Technical and Operational Guidance Series
trans-1,2-DCE	trans-1,2-dichloroethene
USEPA	Unites States Environmental Protection Agency
VC	vinyl chloride
VOC	Volatile Organic Compound

SECTION 1 PROJECT DESCRIPTION

1.1 INTRODUCTION

This generic Quality Assurance Project Plan (QAPP) has been prepared to support activities and specifies the quality assurance/quality control (QA/QC) procedures for field and laboratory sampling and measurements for work assignments awarded by the New York State Department of Environmental Conservation (NYSDEC) under Standby Engineering Contract #D009811. The specific objectives of the QAPP are:

- Foster data quality that is sufficient to meet the investigation objectives and to support the decision-making process
- Provide a standard for control and review of measurement data to confirm that the data are scientifically sound, representative, comparable, defensible, and of known quality.

This QAPP has been prepared in accordance with USEPA guidance (USEPA, 2000a, 2002b) and NYSDEC guidance (NYSDEC, 2019, 2020). Project or site specific work plans for each work assignment awarded will have additional scope and quality requirements that may not be addressed in this QAPP. Addendums to this QAPP or a project specific QAPP may be required for each work assignment.

Project scope and descriptions of the work assignment are provided in the specific Work Assignment Scoping Documents including the project specific QAPP. A site map indicating sample locations will also be included in the project specific QAPP. Standard field operating procedures including groundwater sampling, surface water sampling, soil/sediment sampling, vapor intrusion sampling, emerging contaminate sampling of 1,4-dioxane and per- and polyfluorinated alkyl substances (PFAS), decontamination activities, monitoring well development, slug testing, etc., are included in the Generic Field Activities Plan (FAP) and the project specific FAP. The January 2020 NYSDEC Guidelines for the Sampling and Analysis of PFAS are included in Attachment 1.

Polyfluoroalkyl substances (PFAS), can be found in many standard environmental sampling materials, including: Fluoropolymer bailer/tubing, some decontamination solutions, and pump bladders/valves. One specific PFAS compound, perflourooctanoic acid (PFOA), has been broadly utilized in the production of various everyday items such as: waterproof/stain-resistant clothing, non-stick cookware, and many commonly used plastics. The field activities and methods herein have been appropriately modified to prevent cross-contamination during sampling for PFAS and 1,4-dioxane.

The sampling team will review the summary of prohibited and acceptable items prior to mobilization to prevent cross contamination and to avoid the introduction of external contaminant sources. **Table 1.1** includes a summary of prohibited and acceptable PFAS and 1,4-dioxane items. A PFAS and 1,4-dioxane sampling checklist is included as Attachment 2 and should be filled out daily by field personnel. Additionally, field sampling efforts will comply with the NYSDEC Guidelines for Sampling and Analysis of PFAS under NYSDEC's Part 375 Remedial Programs (January 2020).

SPECIAL PRECAUTIONS FOR PFAS SAMPLING
Refer to **TABLE 1.1** for special clothing, PPE, supply and equipment requirements for PFAS and 1,4-dioxane sampling. Bottles for PFAS samples should be stored and shipped to and from laboratory in separate coolers from other bottleware/samples. DO NOT mix bottleware for PFAS samples with other bottleware to make bottle sets for sample locations.

Change nitrile gloves prior to handling bottles for PFAS analysis and collection of samples for PFAS analysis.

A PFAS and 1,4-dioxane sampling checklist is included as **Attachment 2** and should be filled out daily by field personnel.

TABLE 1.1 PROHIBITED AND ACCEPTABLE ITEMS FOR PFAS AND 1,4-DIOXANE SAMPLING

PROHIBITED	ACCEPTABLE
Field Equipment	
Teflon® containing materials	High Density High density polyethylene (HDPE), stainless steel or polypropylene materials
Low density polyethylene (LDPE) materials	Acetate liners Silicone Tubing
Waterproof field books, waterproof paper and waterproof sample bottle labels	Loose non-waterproof paper and non-waterproof sample labels
Waterproof markers / Sharpies®	Pens
Post-It Notes®	Tape; loose leaf paper
Chemical (blue) ice packs	Wet Ice
Field Clothing and PPE	
New cotton clothing or synthetic water resistant, waterproof, or stain-treated clothing, clothing containing Gore-TexTM	ell-laundered clothing made of natural fibers (preferable cotton)
Clothing laundered using fabric softener	No fabric softener
Boots containing Gore-TexTM or treated with water- resistant sprays	Boots made with polyurethane and PVC
Coated Tyvek®	Laundered cotton clothing
No cosmetics, moisturizers, hand cream, or other related products as part of personal leaning/showering routine on the morning of sampling	Sunscreens - Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss My Face, and baby sunscreens that are "chemical free", "toxin free", or "natural"
Sunscreens or insecticides except as noted on right	Insect Repellents - Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellant, Herbal Armor, California Baby Natural Bug Spray, Baby Ganics Sunscreen and insect repellant - Avon Skin So Soft Bug Guard Plus - SPF 30 Lotion
Sample Containers	
LDPE or glass containers	HDPE or polypropylene
Teflon®-lined caps	Unlined polypropylene caps
Rain Events	

Waterproof or resistant rain gear	Wet weather gear made of polyurethane and PVC only; field tents that are only touched or moved prior to and following sampling activities
Equipment Decontamination	
Decon 90® Water from an on-site well	Alconox® and/or Liquinox®

SECTION 2 PROJECT ORGANIZATION

2.1 PROJECT AND TEAM ORGANIZATION

The project organization and the function and responsibility of each group affected by the QAPP are presented in the Work Assignment Scoping Documents for each assignment and the project specific QAPP. The project organization is designed to promote the exchange of information and for efficient project operation. Key contact information and resumes of project personnel are summarized and presented in the Work Assignment Scoping Documents and the project specific QAPP.

2.1.1 Analytical Services

The analytical laboratory (or laboratories) will analyze environmental samples collected for the specified project. Laboratory operations will be conducted under the supervision of a general manager or laboratory director and a quality assurance manager. A laboratory project manager and alternate will be assigned to each project. The laboratory project manager will be the primary point of contact and will be responsible for coordination and quality of all laboratory activities associated with the project. The laboratory's project manager will manage project sample receipt, analysis scheduling, and data reporting. In case of temporary absence, the direct supervisor will assume the responsibilities of the absent employee or delegate the responsibility to qualified personnel. Sample Management Staff is responsible for receiving, logging, and maintaining internal custody of samples during the sample's residence in the laboratory. In addition, the laboratory will ensure that project analytical requirements are met; monitor project analytical compliance and immediately notify Parsons if conflict or discrepancies arise; initiate and implement appropriate corrective actions; ensure adequate quality review of deliverables prior to release; and participate in coordination meetings.

2.2 SPECIAL TRAINING/CERTIFICATION

Management and field personnel must review the requirements of this QAPP to make certain that persons assigned to specific tasks have appropriate credentials and experience. The Field Team Leaders will check that all onsite personnel have read and understood the QAPP.

Field personnel will be required to adhere to the generic Health and Safety Plan (HASP) and FAP. They must also follow applicable task-specific health and safety plans that project subcontractors develop before they begin investigation activities.

Laboratories will have trained and experienced staff capable of performing the analyses specified in this QAPP. Laboratories will have New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) certification for all analyses pertaining to solid and hazardous waste categories. Laboratories will provide a copy of their ELAP certification, Quality Assurance Manual (QAM), and laboratory SOPs prior to commencement of the work assignment. Additionally, the laboratories must be able to demonstrate that they have analyzed performance-evaluation or proficiency-testing samples within 12 months of beginning the analyses.

All personnel independent of the laboratory generating the data who are performing data validation and verification must have experience in data validation, quality assurance oversight, and auditing. The data validator must have a Bachelor's degree in chemistry or natural sciences with a minimum of 20 credit hours in chemistry; one year experience in the implementation and application of analytical laboratory methodologies; and one year experience evaluating data packages of all matrices (e.g., soil, water, air, tissue) for compliance and usability with respect to the USEPA National Functional Guidelines with regional modifications and NYSDEC guidance (NYSDEC, 2020).

3.0 DATA QUALITY OBJECTIVES AND DATA QUALITY CRITERIA

3.1 INTRODUCTION

A systematic planning process will develop site-specific data quality objective (DQOs). These DQOs will clarify study objectives, define the appropriate type of data, and specify tolerable levels of potential errors. These parameters, in turn, will be the basis for establishing the quality and quantity of data needed to support the utility of the data. This section was prepared in accordance with USEPA Guidance for the Data Quality Objectives Process (USEPA, August 2000). Project DQOs will be developed using the "seven-step" DQO process, consisting of the following steps:

Step 1: State the problem
Step 2: Identify the decision
Step 3: Identify inputs to the decision
Step 4: Define the study boundaries
Step 5: Define the decision rule
Step 6: Specify tolerable limits of decision error
Step 7: Optimize the design

Data quality objectives specify the underlying reason for collecting the data and the data type, quality, quantity, and uses needed to make decision, and they provide the basis for designing data collection activities. DQOs and quality assurance objectives are related data quality planning and evaluation tools for all sampling and analysis tools.

The purpose of this QAPP is to provide a standard for control and review of measurement data to ensure they are scientifically sound, representative, comparable, defensible, and of known quality. The data will be used to evaluate the physical and chemical attributes of samples collected. The project objective for analytical testing is to characterize the physical characteristics and chemical constituents and to provide data to support the decision-making process.

The data produced during sampling activities will be compared with the defined quality assurance (QA) objectives and criteria for precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) to see that the data reported are representative of actual conditions at the site.

This data assessment activity is an on-going coordinated process with data production and is intended to assure that data produced during the project are acceptable for use in subsequent evaluations. Both statistical and qualitative evaluations will be used to assess the quality of the data. The primary evaluation of the data will be based upon the field quality control samples described in Section 8.1.1 and the laboratory quality control samples described in Section 8.1.2. The "blank" samples (laboratory QC blank samples and field QC blank samples) will be used to evaluate whether or not the laboratory and/or the field team's procedures for handling of samples represent a possible source of sample contamination. Laboratory duplicate sample results will be used to evaluate analytical precision. Field duplicate sample results will be used to evaluate the overall precision of the sampling and analysis process, as well as sample representativeness and site heterogeneity. Laboratory control samples will be used to evaluate the accuracy of analytical results, as will other analysis-specific criteria, such as surrogate compound recoveries for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), 1,4-dioxane, PFAS, pesticides, polychlorinated biphenyls (PCBs), and herbicides. Matrix spike/matrix spike duplicate (MS/MSD) analysis of project samples will be used to evaluate potential sample matrix effects on the analytical results (both of the sample utilized for MS/MSD and of other samples collected from the site). For all sample results, the impact of sample-specific, analysis-specific, and site-specific factors will be evaluated, and an assessment will be made as to their impact, if any, on the data. Duplicate sample (field and laboratory QC samples) results will be used to evaluate data precision.

3.1.1 Data Use Objectives

Data use objectives define why analyses are being conducted and how ultimately the data will be used to meet the overall project objectives. For the work assignment activities, these project objectives are stated in the Work Assignment Scoping Documents.

3.2 DATA QUALITY OBJECTIVES (PARCCS PARAMETERS)

3.2.1 Introduction

Data Quality Objectives (DQOs) are based on the premise that different data uses require different levels of data quality. The term *data quality* refers to a degree of uncertainty with respect to PARCCS data quality indicators. Specific objectives are established to develop sampling protocols and identify applicable documentation, sample handling procedures, and measurement system procedures. These DQOs are established by onsite conditions, objectives of the project, and knowledge of available measurement systems. Overall work assignment DQOs are presented and discussed in detail in this QAPP. A wide range of data quality is achieved through the use of various analytical methods. The following data quality levels are widely accepted as descriptions of the different kinds of data that can be generated for various purposes:

- **Level I, Field screening or analysis using portable instruments (e.g., photoionization detector [PID]):** Results are often not compound-specific, but results are available in real time. Depending on the analysis being performed and the instrumentation used, the results may be considered qualitative, semi-quantitative, or quantitative.
- **Level II, Field analysis using more sophisticated portable analytical instruments (e.g., on-site mobile laboratory):** There is a wide range in the quality of data that can be generated depending on the use of suitable calibration standards, reference materials, and sample preparation equipment. Results are available in real-time or typically within hours of sample collection.
- **Level III, All analyses performed in an off-site analytical laboratory using methods other than USEPA-approved analytical methods**: These data generally do not include the level of formal documentation required under Level IV and are not subject to formal data validation. These data are typically used for engineering studies (e.g., treatability testing), site investigations and remedial design.
- **Level IV, Data generated using USEPA methods and enhanced by a rigorous QA program, supporting documentation, and data validation procedures:** These data are typically used for engineering studies (e.g., treatability testing), risk assessment, site investigations, and remedial design, and may be suitable for litigation/enforcement activities. Results are both qualitative and quantitative.

Work assignment data quality level requirements for sample analyses may be as follows:

- Level I data quality will be obtained for field screening data collected with portable instruments such as pH meters, temperature probes, and PIDs which will be used for health and safety and field operational monitoring. In addition, these instruments or field test kits may be used to produce data for determining where to collect a sample to assess impacts and for field screening of samples to be designated for laboratory confirmation analyses.

- A Level II data quality assurance program will be executed by the field team for obtaining data.
- A Level III data quality assurance program will be executed by the laboratory for chemical analyses not required to be Level IV, such as pH.
- A Level IV data quality assurance program will be executed, in general, by the laboratory for chemical analyses necessary to meet the work assignment objectives.

3.2.2 PARCCS Parameters (Data Quality Indicators)

3.2.2.1 Precision

Precision is an expression of the reproducibility of measurements of the same parameter under a given set of conditions. Specifically, it is a quantitative measurement of the variability of a group of measurements compared to their average value (USEPA, 1987). Precision is usually stated in terms of standard deviation, but other estimates such as the coefficient of variation (relative standard deviation), absolute difference (D), range (maximum value minus minimum value), relative range, and relative percent difference (RPD) are common.

The objectives for precision for each chemical are based on the capabilities of the approved EPA analytical method with respect to laboratory performance. For this project, field-sampling precision will be determined by analyzing coded (blind) duplicate samples for the same parameters, and then, during data validation, calculating the %RPD for duplicate sample results. Field duplicate precision criteria for the water samples will be 30%RPD and 50%RPD for soil and air samples. The laboratory will determine analytical precision by calculating the %RPD or %D, as applicable to the analytical method being used, e.g., pH will be evaluated using %D.

The laboratory will determine analytical precision by calculating the RPD for the results of the analysis of the laboratory duplicates and matrix spike duplicates. The formula for calculating %RPD is as follows:

$$\%RPD = \frac{|V1 - V2|}{(V1 + V2)/2} \times 100$$

where:

RPD	=	Relative percent difference
V1, V2	=	Values to be compared
|V1 - V2|	=	Absolute value of the difference between the two values
(V1 + V2)/2	=	Average of the two values

For data evaluation purposes, in instances where both sample concentrations are less than five times (<5x) the RL, duplicate precision will be evaluated using the calculated %D result. In this instance, the applicable precision criterion will be two times the RL (2xRL). If a value is not detected, the %RPD criterion will be considered to be not applicable and the %RPD will not be calculated (i.e. precision will not be quantitatively determined). The data quality objectives for analytical precision, calculated as the RPD between duplicate analyses, are defined in the Work Assignment Scoping Documents for each analytical method and in Table 3.1.

3.2.2.2 Accuracy

Accuracy is a measure of the degree of agreement of a measured value with the true or expected value of the quantity of concern (Taylor, 1987) or the difference between a measured value and the true or accepted reference value. The accuracy of an analytical procedure is best determined by the analysis of a sample containing a known quantity of material and is expressed as the percent of the known quantity that is recovered or measured. The recovery of a given analyte depends on the sample matrix, method of analysis, and the specific compound or element being determined. The concentration of the analyte relative to the detection limit of the analytical method is also a major factor in determining the accuracy of the measurement. Concentrations of analytes that are less than the quantitation limits are less accurate because they are more affected by such factors as instrument "noise." Higher concentrations will not be as affected by instrument noise or other variables and, thus, will be more accurate.

The objectives for accuracy for each chemical are based on the capabilities of the approved USEPA analytical method with respect to laboratory performance. Analytical accuracy is typically assessed by examining the percent recoveries of surrogate compounds that are added to each sample (organic analyses only), the percent recoveries of matrix spike compounds added to selected samples, and the percent recoveries of spike compounds added to laboratory control samples (LCS). An LCS will be analyzed to provide additional information on analytical accuracy. Additionally, initial and continuing calibrations must be performed and accomplished within the established method control limits to define the instrument accuracy before analytical accuracy can be determined for any sample set.

Accuracy is normally measured as the percent recovery (%R) of a known amount of analyte, called a *spike*, added to a sample (matrix spike or laboratory control). The accuracy on a per sample basis will be measured using surrogates for the organics analyses. The %R is calculated as follows:

Matrix Spike Recovery: $$\% \text{ Recovery} = \frac{SSR - SR}{SA} \times 100$$

where:

%R	=	Percent recovery
SSR	=	Spike sample result: concentration of analyte obtained by analyzing the sample with the spike added
SR	=	Sample result: the background value; *i.e.,* the concentration of the analyte obtained by analyzing the sample
SA	=	Spiked analyte: concentration of the analyte spike added to the sample

Surrogate Recovery: $$\% \text{ Recovery} = \frac{\text{Concentration (or amount) found}}{\text{Concentration (or amount) spiked}} \times 100$$

LCS Recovery: $$\% \text{ Recovery} = \frac{\text{Concentration (or amount) found}}{\text{Concentration (or amount) spiked}} \times 100$$

The acceptance limits for accuracy for each parameter are presented in the Work Assignment Scoping Documents and in Table 3.1.

3.2.2.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point or an environmental condition. Representativeness is a qualitative parameter and is most concerned with the proper design of the sampling program (USEPA, 1987). Samples must be representative of the environmental media being sampled. An important factor in the selection of sample locations and sampling procedures will be obtaining representative samples.

Field and laboratory procedures will be performed in such a manner as to ensure, to the degree technically possible, that the data derived represents the in-place quality of the material sampled. Care will be exercised to see that chemical compounds are not introduced to the sample from sample containers, handling, and analysis. Field blanks, equipment rinse blanks, trip blanks, and laboratory method/prep blanks will be analyzed to monitor for potential sample contamination from field and laboratory procedures.

The assessment of representativeness also must consider the degree of heterogeneity in the material from which the samples are collected. Sampling heterogeneity will be evaluated during data validation through the analysis of coded (blind) field duplicate samples. The analytical laboratory will also follow acceptable procedures to assure the samples are adequately homogenized prior to taking aliquots for analysis such that the reported results are representative of the sample received. Chain-of-custody (COC) procedures will be followed to document the possession of sample containers from the time of container preparation through sample collection and receipt back at the laboratory. Field QC samples will be collected and analyzed to provide information to evaluate sample representativeness. Details of field QC sample collection (field blanks, equipment rinse blanks, trip blanks, temperature blanks, field duplicates) and COC procedures are presented in Section 4.2 and Section 8.1.1.

3.2.2.4 Completeness

Completeness is defined as the percentage of measurements that meet the project's data quality objectives (USEPA, 1987). Completeness is calculated for each method (or analyte) and sample matrix for an assigned group of samples. Completeness for a data set represents the results usable for data interpretation and decision making. The completeness objective for the analytical and field data is 95%. Completeness is defined as follows for all sample measurements:

$$\%C = \frac{V}{T} \times 100$$

where:

%C = Percent completeness

V = Number of measurements judged valid (not rejected during data validation)

T = Total number of measurements

Completeness, which is expressed as a percentage, is calculated by subtracting the number of rejected and unreported results from the total planned results and dividing by the total number of results. Results rejected because of out-of-control analytical conditions, severe matrix effects, broken or spilled samples, or samples that could not be analyzed for any other reason, negatively affect influence completeness and are subtracted from the total number of results to calculate completeness.

3.2.2.5 Comparability

Comparability expresses the degree of confidence with which one data set can be compared to another (USEPA, 1987). The comparability of all data collected for this project will be managed by:

- Using identified standard methods (including laboratory SOPs) for both sampling and analysis phases of this project
- Requiring traceability of all analytical standards and/or source materials to the USEPA or National Institute of Standards and Technology (NIST)
- Requiring that calibrations be verified with an independently prepared standard from a source other than that used for calibration (if applicable)
- Using standard reporting units and reporting formats including the reporting of QC data

- Performing data validation on the analytical results, including the use of data qualifiers in all cases where appropriate
- Evaluating the sample collection information and analytical QC sample results
- Requiring that the significance of all validation qualifiers be assessed any time an analytical result is used for any purpose.

By taking these steps during the investigation, future users of either the data or the conclusions drawn from them will be able to judge the comparability of these data and conclusions.

3.2.2.6 Sensitivity and Quantitation Limits

When selecting an analytical method during the DQO process, the achievable detection limit (DL) and method reporting limit (RL) must be evaluated to verify that the method will meet the project quantitation limits necessary to support project decision making requirements. This process ensures that the analytical method sensitivity has been considered and that the methods used can produce data that satisfy users' needs while making the most effective use of resources. The concentration of any one target compound that can be detected and/or quantified is a measure of sensitivity for that compound. Sensitivity is instrument, compound, method, and matrix specific and achieving the required project quantitation limit (PQL) and/or method detection limit (MDL) objectives depends on instrument sensitivity and potential matrix effects. With regard to instrument sensitivity, it is important to monitor the instrument performance to ensure consistent instrument performance at the low end of the calibration range. Instrument sensitivity will be monitored through the analysis of method/prep blanks, calibration check samples, and low standard evaluations.

Laboratories generally establish limits that are reported with the analytical results; these results may be called reporting limits, detection limits, quantitation limits, or other terms. These laboratory-specific limits, apply undiluted analyses and must be less than or equal to the project RLs. The RL, also known as the PQL, represents the concentration of an analyte that can be routinely measured in the sampled matrix within stated limits and with confidence in both identification and quantitation. Throughout various documents RL and PQL may be interchanged, but they effectively have the same meaning. The RLs are established based on specific knowledge about the analyte, sample matrix, project specific requirements, and regulatory requirements. The RL is typically established by the laboratory at the level of the lowest calibration standard and is generally in the range of two to ten times the MDL.

The MDL is defined as "the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results" (40 Code of Federal Regulations (CFR) 136 Appendix B). MDLs are experimentally determined and verified for each target analyte of the methods in the sampling program. The laboratory will determine MDLs for each analyte and matrix type prior to analysis of project samples. In addition, when multiple instruments are employed for the analysis of the same method, each individual instrument will maintain a current MDL study. MDLs are statistically calculated in accordance with the Title 40, Code of Federal Regulations Part 136 (40 CFR 136) as promulgated in September 2017. If risk-based project objectives are developed, then where practicable, MDLs must be lower than the risk-based criteria determined for the project.

Laboratory RLs and MDLs for all analyses will meet at a minimum the standards criteria specified in the NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives for Unrestricted Use, the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations," NYSDOH May 2017 Soil Vapor/Indoor Air Matrix, and/or Guidelines for Sampling and Analysis of PFAS under NYSDEC's Part 375 Remedial Programs.

Analytical results below the MDL will be flagged with a *U* at the RL to indicate the data are non-detect. However, the laboratory will flag analytes detected at a level less than the RL but greater than the MDL (or the laboratory's determined minimum reportable concentration) with a *J* to denote an estimated concentration.

When results are corrected for dry weight, the reporting limits are then elevated accordingly. To compensate for the low solids, modifications are made either to increase the initial volume extracted/digested or to reduce the final volume of extract/digestate.

For samples that do not meet the project-specified RLs or MDLs, (taking into consideration elevated detection limits due to percent solids or percent moisture and aliquots used for the designated analysis), the laboratory must make available compelling documentation (e.g., screening data) and a justifiable explanation for its inability to meet the specified limits using the project protocols. It must also provide an appropriate, justifiable explanation of the issues and resolution in the analytical report/data package (dilution factor, interference, etc.). Excessive, unnecessary dilutions on any sample for a project are unacceptable. The laboratory will analyze all samples initially undiluted unless a preliminary analytical screen is performed and is indicative of instrument damage or compromise may occur if the sample is not analyzed initially at dilution. In this instance, the sample will be analyzed at the lowest possible dilution factor. If multiple extractions/ analyses are performed (such as undiluted and diluted analyses), resulting in several data sets for the same sample, the laboratory will report all data and results from each of the multiple analyses in the data package.

Quantitation limits for all definitive data quality level laboratory analytical methods, compounds, and matrices are to be addressed for each work assignment in the Work Assignment Scoping Documents and in Table 3.2. Individual soil sample RLs and MDLs will be adjusted accordingly based on moisture and aliquots used for analysis.

SECTION 4 DATA ACQUISITION

4.1 SAMPLING METHODS

Any non-disposable sampling equipment used for chemical sampling will be cleaned and decontaminated prior to use to prevent potential cross-contamination between each use. The NYSDEC Generic FAP, SOP included by reference, best practices, and field decontamination methods will be used to mitigate cross contamination. Additionally, this QAPP describes management, handling, and tracking procedures for investigation-derived waste, including solid and liquid materials, and personal protective equipment.

The special precautions described here will be taken to confirm that each sample collected is representative of the conditions at that location and that the sampling and handling procedures neither alter nor contaminate the sample. If failure in the sampling or measurement system occurs, the procedures specified in Section 10.3 of this QAPP will be followed to identify who is responsible for implementing the appropriate corrective action. This section presents sample container preparation procedures, sample preservation procedures, and sample holding times.

For this program, the laboratory will purchase and distribute certified clean sample containers with chemical preservatives. The sample containers used for chemical analysis must be virgin bottleware, I-Chem™ Series 300 (or equivalent). Vendors are required to provide documentation of analysis for each lot of containers, and the documentation will be kept on file at the laboratory. Alternatively, the laboratory may perform testing to certify that the sample containers are not contaminated. Since the containers supplied by the laboratory will be certified clean, the bottles will not be rinsed in the field prior to use.

Laboratory-supplied sample kits (coolers containing field COC forms, custody seals, sample containers, preservatives, and packing material) will be prepared by the laboratory's Sample Management Staff and shipped to the Field Team Leader. The type of containers, required sample volumes, preservation techniques, and holding times for specific analyses are presented in the Work Assignment Scoping Documents and in Table 4.1.

Samples requiring chemical preservation will be collected in sample containers provided by the analytical laboratory that already contain sufficient quantities of the appropriate preservative(s) to ensure that the sample is kept in accordance with the method requirements. The laboratory must provide an adequate amount of pre-preserved bottles with traceable high-purity preservatives, and additional preservative for use if the added amount is not sufficient, based on request by the Field Team Leader and on an as-needed basis if additional bottleware is needed during the field activities. The field team must verify that the preservative has been added appropriately.

4.2 SAMPLE HANDLING AND CUSTODY

This section presents sample handling and custody procedures for both the field and laboratory. Implementation of proper handling and custody procedures for samples generated in the field is the responsibility of field personnel. Both laboratory and field personnel involved in the COC and transfer of samples will be trained as to the purpose and procedures prior to implementation. For transfer of samples within the laboratory, an internal COC will be required.

4.2.1 Sample Handling

Samples to be collected for each work assignment will be specified in the Work Assignment Scoping Documents and FAP. After the samples are collected, they will be split as necessary among preserved containers appropriate to the parameters to be analyzed. Each container will be provided with a sample label that will be filled out at the time of collection. The sampler will print label information, specified below, on each label either before or immediately after collecting the sample with an indelible writing instrument. The label will be protected from water and solvents with clear label packing tape.

The following information, at a minimum, is required on each sample label (note: the location ID and the sample ID as described in the Data Management section below inherently identify some of this information, see below):

- Client
- Project name
- Sampling location
- Sample number
- Date and time of sample collection
- Parameters to be analyzed
- Preservative(s) added, if any
- Initials of the sampler.

Following sample collection, excess soil, water, etc., will be wiped from the outside of the sample containers with a paper towel and the lids will be checked to verify they are tightly closed. Each glass container will be wrapped with bubble wrap to minimize breakage during transport. Bottles containing soil, sediment, and water samples will be placed in separate Ziploc® bags (one bag) and set on ice (ice bath not necessary). Documentation of equipment and methods used in the field for treating the samples will be maintained in the field logs, and a COC will be initiated to document transfer of the samples from the field team to the laboratory. In preparation for shipment to the analytical laboratory, the shipment cooler will be packaged as follows:

Soil and water samples:

- Fill a dry shipment cooler with inert cushioning to a depth of 1 inch to prevent bottle breakage. A separate shipment cooler will be used for PFAS samples.
- Place the bagged samples and the laboratory-provided temperature blank upright in the sample cooler. The temperature blank should be placed in the center (horizontally and vertically) with the samples surrounding.
- Place additional cushioning material around the sample bottles as necessary.
- Place bags of ice in the remaining void space to keep the samples cooled to 4 degrees Celsius (°C).
- Complete the COC form (see Section 4.2.2). Place the COC form in a polyethylene, sealable bag (such as a 1-gal Ziploc® bag or equivalent) and tape the bag to the interior of the cooler lid. Field personnel retain a copy of the COC form; another copy is transmitted to data management personnel, quality assurance officer (QAO), and the Project Manager specified in the Work Assignment Scoping Documents.
- Prior to sealing for shipment, the list of samples will be checked against the container contents to verify the presence of each sample listed on the COC record including the temperature blank.
- Affix a custody seal to the cooler.
- Seal the cooler securely with packing tape, taking care not to cover labels if already present.
- Label the cooler appropriately in accordance with the Department of Transportation (DOT) regulations (49 CFR 171 through 179).
- Ship the samples in accordance with the DOT requirements outlined in 49 CFR 171 through 179. Complete the carrier bill of lading and retain a copy on file.
- Samples will be delivered to the laboratory by the most expedient means to meet holding times. Whenever practicable, samples will be shipped on the day of collection for delivery to the laboratory the morning of the day after collection. The laboratory will be required to adhere to holding times for sample analyses. Laboratory performance requirements for analysis turnaround time will be established from the day of

sample collection in accordance to NYSDEC requirements. The field team will carefully coordinate sampling activities with the laboratory to see that holding times are met.

The required holding times must be adhered to for the initial sample preparation/analysis. If subsequent reanalysis or re-extraction becomes necessary because of method requirements or additional requirements stated here, the laboratory will make every effort to perform those re-extractions and/or reanalysis within the primary holding times. Any holding time that is exceeded will be reported immediately to the Project Manager and the QAO by the laboratory QA manager.

Vapor intrusion samples are typically shipped to the lab in the same box the lab sent them in. The return shipment should include all samples properly labeled consistent with sample identification used on the COC. The return shipment should include any flow regulators, duplicate sample tees, an extra summa canisters not used for sampling. Complete a copy of the COC (see Section 4.2.2) and place the COC in a sealable bag. Field personnel retain a copy of the COC; another copy is transmitted to the data management personnel, QAO, and the Project Manager specified in the Work Assignment Scoping Documents.

4.2.2 Field Sample Custody

The primary objective of sample custody procedures is to create an accurate written record that can be used to trace the possession and handling of samples from the moment of their collection through analysis until their final disposition. A sample (or sample container) will be considered under custody if:

- In a person's possession
- Maintained in view after possession is accepted and documented
- Locked and tagged with custody seals placed on the sample cooler so that no one can tamper with it after having been in physical custody
- In a secured area that is restricted to authorized personnel.

The sample custody flowchart is shown in Figure 4.1.

DATA REQUIRED ON CHAIN-OF-CUSTODY
Project name and client Signatures of samplers Sample number, date and time of collection, and grab or composite sample designation Signatures of individuals involved in sample transfer If applicable, the air bill or other shipping number
ADDITIONAL ITEMS THAT SHOULD BE INCLUDED
Sample matrix Number of sample containers Analyses to be performed, Preservative(s) Name of the analytical laboratory to which the samples are sent Method of sample shipment Project number.

A COC record will accompany the samples from the time the samples leave the original sampler's possession through the sample shipments' receipt at the laboratory. Triplicate copies of the COC record must be completed for each sample set collected. See chart for data requirements.

If samples are split and sent to different laboratories, a copy of the COC record is sent with each sample.

The REMARKS space on the COC form is used to indicate if the sample is a matrix spike/matrix spike duplicate (MS/MSD), or any other sample information for the laboratory. Since they are not specific to any one-sample point, blanks are indicated on separate rows. Immediately prior to sealing the sample cooler, the sampler will sign the COC form and write the date and time on the first RELINQUISHED BY space. The sampler will also write the method of shipment, the shipping cooler identification number, and the shipper air bill number on the top of the COC form. Mistakes will be crossed out with a single line in ink and initialed by the author.

Sampling personnel will retain one copy of the COC form, and the other two copies are put into a sealable plastic bag and taped inside the lid of the shipping cooler. The cooler lid is closed, custody seals provided by the laboratory are affixed to the latch and across the back and front lids of the cooler, and the person relinquishing the samples signs his or her name across the seal. The seal is taped, and the cooler is wrapped tightly with clear packing tape. Field personnel then relinquish the cooler to personnel responsible for shipment, typically an overnight carrier.

The COC seal must be broken to open the sample cooler. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Field Team Leader for direction on whether to proceed with the analyses.

Sampling personnel record the information placed on the COC record in the field logs. They also include in the log a detailed description of the exact locations from which the samples were collected, any pertinent conditions under which the samples were obtained, and the lot number of the containers used.

4.2.3 Laboratory Sample Management

The laboratory has a designated Sample Management Staff responsible for receiving samples in the laboratory, opening the coolers, checking the sample integrity and custody seals, logging samples into the laboratory information management system (LIMS), and controlling the handling and storage of samples while in the laboratory. The laboratory is a secure facility and only authorized laboratory personnel are allowed to handle active samples. The laboratory maintains an SOP for sample management.

4.2.4 Sample Receipt and Logging

Upon receipt at the laboratory, sample-receiving personnel inspect the samples for integrity of the custody seal, check the shipment against the COC form, and note any discrepancies. Specifically, the sample-receiving personnel note any damaged or missing sample containers. At this time, the field COC record is completed and signed by the Sample Management Staff.

Using the temperature blank in each cooler, the temperature of each incoming sample cooler is measured and recorded during the sample receipt and log-in procedures before samples are placed in laboratory cold storage. Similarly, the laboratory documents that its cold storage facilities are being maintained through daily (at a minimum) documented temperature measurements using a thermometer.

Upon receipt, Sample Management Staff measure and record on the preservation documentation sheet the pH of acid- or base-preserved aqueous samples. Any problems observed during sample receipt must be communicated to the Field Team Leader and/or the QAO verbally and either by fax transmission or email within 24 hr (preferably 3 hr beginning with the normal business day or immediately following for problems noted during second shifts or weekends) after discovery and before samples are released to the laboratory for analysis. Problems may include but are not limited to broken bottles, errors or ambiguities in paper work, insufficient sample volume or weight, inappropriate pH, and elevated temperature.

When the shipment is inspected and the COC record agree, the sample receiving personnel enter the sample and analysis information into the LIMS and assign each sample a unique laboratory number. This number is affixed to each sample bottle.

4.2.5 Sample Storage Security

While in the laboratory, the samples and aliquots that require cold storage will be stored and will be maintained in a secured refrigerator unless they are being used for preparation and/or analysis. All of the refrigerators in the laboratory used for storage of samples have restricted access and are numbered. In addition, dedicated refrigerators are designated for extracts and analytical standards. The sample storage areas are in the laboratory, and access is limited to laboratory personnel. Specific requirements for sample storage are described below:

- Samples will be removed from the shipping container and stored in their original containers unless damaged.
- Damaged samples will be disposed in an appropriate manner, and the disposal will be documented or repacked as necessary and appropriate.
- Samples and extracts will be stored in a secure area designed to comply with the storage method(s) defined in the contract.
- The storage area will be kept secure at all times. The sample custodian or designated personnel will monitor access to the storage area.
- Standards or reagents will not be stored with samples or sample extracts.

The following SOPs for laboratory sample security will be implemented to confirm that the laboratory satisfies sample COC requirements:

- Samples will be stored in a secure area.
- Access to the laboratory will be through a monitored area. Other outside access doors to the laboratory will be kept locked.
- Visitors must sign a visitor's log and will be escorted while in the laboratory.
- Refrigerators, freezers, and other sample storage areas will be securely maintained.

Storage blanks will be initiated and analyzed on a weekly basis for each cold storage unit used to hold samples submitted for the analysis of VOCs. Field QC samples must be stored in the same cold storage units as the samples that they are associated with (even if the matrices are different). All soil samples must undergo thorough sample homogenization (stirred within the original sample container) using inert utensils and mixing platforms that will not interfere with the target analytes being requested for analysis with the exception of soil samples submitted for the analysis of VOCs. Samples for VOC determinations will be stored in a secure refrigerator separate from other samples, sample extracts, reagents, and standards.

4.2.6 Retention and Disposal of Samples

The laboratory must retain all excess samples within their original sample bottles for a minimum of 30 days in cold storage (below 4°C) following submission of the validated data to NYSDEC. At that time, the laboratory must contact the Field Team Leader for authorization for responsible disposal or further storage instructions. At the point at which the laboratory is provided authorization to dispose of the samples, the laboratory will be responsible, and will assume all liability for proper characterization and disposal of samples and bottleware in accordance with all local, state, and federal regulations.

SECTION 5 DATA MANAGEMENT

5.1 INTRODUCTION

The electronic data management systems for each work assignment will be implemented to process the information effectively without loss or alteration. As of April 1, 2011, the New York State Division of Environmental Remediation (DER) has implemented an Environmental Information Management System (EIMS). The EIMS uses the database software application EQuIS™ from EarthSoft® Inc. In an effort to improve the management of environmental data and reduce paper quantities, all laboratory analytical data minus instrument raw data must be submitted in the DEC-approved Electronic Data Deliverable (EDD).

Data providers must download and install the EQuIS Data Processor (EDP) to check their properly formatted EDD as well as the NYSDEC DER Format file. The EDP performs a series of formatting checks on the EDD and identifies any errors in the data file prior to submission. All EDDs are to be error free when submitted. It is important that the most recent version of the EDP and NYSDEC format file are employed since the valid values used by EIMS are periodically updated for the EDP.

5.2 FIELD DATA MANAGEMENT

The Field Team Leader will manage data generated in the field. This person or their designee will be responsible for recording and documenting sampling activities in the field logs, on sampling records (as appropriate), and on COC forms (when samples are collected) as described in Section 4.2.2. The records may be photocopied and stored in the project file along with the original.

A sample nomenclature system was developed with the data management team. Each sample name will be unique to include a location ID and field sample ID. The Database Manager will add data to EIMS through the input module of the system.

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DATA INPUT TO EIMS MAY INCLUDE:
– Sample planning information (e.g., sample depth) – Chain-of-custody data – Sediment coring logs – Geotechnical data – Location and geographic data – Field measurements – Meteorological data – Waste characterization data – Groundwater levels – Radiodating data – Laboratory analytical data

5.3 LABORATORY DATA MANAGEMENT

Laboratory data management involves several important stages that include data transformation, review, verification, and validation, as well as data storage, retrieval, and security. The laboratory will implement a data management system to manage the data from its generation in the laboratory to its final reporting and storage. The data management system will include, but not be limited to, the use of standard record-keeping practices, standard document control systems, and the electronic data management system.

The laboratory data reduction, verification, validation, and reporting procedures and project data management activities, data/information exchange procedures ensure that complete documentation is maintained, transcription and reporting errors are minimized, and data are properly review.

Specific laboratory data management requirements and procedures are discussed in Sections 6 and 9 of this QAPP.

SECTION 6 DOCUMENTS AND RECORDS

6.1 INTRODUCTION

Records will be maintained to document accurately the data generation process during investigation in the field, sample analysis in the lab, and during data validation. Project documentation will be maintained in general accordance with guidelines in the National Enforcement Investigation Center Policies and Procedures (USEPA, 1986). A project file will be maintained that will contain appropriate project documentation; see components in chart. Some of this documentation may be retained electronically in lieu of paper copies. Table 6.1 summarizes the types of project documents and records.

MINIMUM COMPONENTS OF PROJECT FILE
- Project plans and specifications
- Field logs and data records
- Photographs, maps, and drawings
- Sample identification documents
- Chain-of-custody records
- Data review notes
- Report notes and calculations
- Progress and technical reports and
- Correspondence and other pertinent information
- Full analytical data deliverables package provided by the lab, including QC documentation and electronic data deliverable

6.2 FIELD RECORDS

Field personnel are responsible for documenting sample handling activities, observations, and data in field sampling records including field logs, COC records, photographs, and pre-design investigation records. The Field Team Leader is responsible for maintaining these documents. Each record is described below.

6.2.1 Field Log

A Field Log will be used to document work assignment activities. The field log will have consecutively numbered pages, and documentation will be recorded using waterproof ink. Incomplete lines, pages, and changes in the log will be lined out with a single line, dated, and initialed. More detailed procedures for documenting investigation activities (such as field sampling records and boring log forms) and type of information to include in the field log may be developed.

MINIMUM REQUIREMENT FOR INFORMATION IN FIELD LOG
- Responsible person's name - Date and time of activity - Equipment and methods used for field preparation of samples - Field measurements of samples (*e.g.,* pH, temperature) - Information coordinating sample handling activities with appropriate field activities and chain-of-custody documentation *Daily calibration activities:* Calibrator's name Instrument name and model Date and time of calibration Standards used and their source Temperature (if appropriate) Results of calibration Corrective actions taken (if any)

6.2.2 Electronic Field Data Management

The field sampling program will have an electronic data management component. The system will be designed to specify the necessary samples taken at any given location and to provide the ability to be updated and amended in the field. This will provide a management system that efficiently tracks the needs of the sampling scope. As the samples are taken, log entries are put in the database, and sample labels are printed. At any given time, a COC record can be printed as well.

6.2.3 Chain-of-Custody Record

The COC record establishes the documentation necessary to trace sample possession from the date and time of sample collection, through sample shipment, to the date and time of arrival at the laboratory designated to perform analysis. The ability to trace the history of a sample is essential to show that the sample collected was, indeed, the sample analyzed and that the sample was not subjected to biasing influences. Evidence of sample traceability and integrity is provided by COC procedures. These procedures are necessary to support the validity of the data and will accompany each shipping container.

A copy of the COC record will be detached and kept with the field log or placed in the project file; the original record will accompany the shipment.

6.3 LABORATORY RECORDS

Laboratories providing analytical support for this project must maintain records to ensure that all aspects of the analytical processes are adequately documented to ensure legal defensibility of the data.

When a mistake is made, the wrong entry is crossed out with a single line, initialed, and dated by the person making the entry, and the correct information recorded. Obliteration of an incorrect entry or writing over it is not allowed, nor is the use of correction tape or fluid on any laboratory records.

Overwriting or disposal of any electronic media prior to a 5-yr expiration period is strictly prohibited. All electronic and hardcopy data must be stored in an easily accessible climate-controlled environment. The laboratory will exercise “best practices” in terms of frequent, redundant electronic backup procedures on proper long-term storage media to assure that all electronic data representing sample analyses will be maintained for the 5-yr storage period. Electronic data must be stored in a secure, limited-access area with redundant copies stored in fireproof vaults and/ or stored off-site of the laboratory facilities.

Sample preparation in the laboratory must be fully documented and include sample preparation conditions (such as digestion temperatures). In addition, documentation must allow complete traceability to all prepared or purchased reagents, acids and solvents, and reference solutions. All spike solutions and calibration standards must be used prior to labeled expiration dates and stored in accordance with manufacturers recommended conditions. Complete and unequivocal documentation must exist to enable traceability of all prepared spike solutions, calibration standards, and prepared reagents back to the reference materials utilized. Organic extracts must be stored in the same type of vials (amber or clear) as the associated standards at the appropriate storage temperatures.

The unit conventions set forth in the figures for reported data will be consistent with standard laboratory procedures. Reporting units used are those commonly used for the analyses performed. Concentrations in soil and rock sediment samples will be expressed in terms of weight per unit dry weight, with moisture content reported for each sample.

Laboratory records used to document analytical activities in the laboratory will include reagent and titrant preparation records, standard preparation logs, sample preparation logs, bench data sheets, instrument run logs, and strip chart recordings/chromatograms/computer output. Additional records will include calibration records, maintenance records, nonconformance memos, and Corrective Action Request (CAR) forms.

LAB RECORDS SHOULD CONVEY:
- What was done - When it was done - Who did it and - What was found

REQUIREMENTS FOR LAB RECORDKEEPING
- Data entries must be made in indelible water-resistant ink
- Date of each entry and observer must be clear
- Observer uses his or her full name or initials
- Initial and signature log is maintained so the recorder of every entry can be identified
- Information must be recorded in notebook or on other records when the observations are made
- Recording information on loose pieces of paper not allowed

6.3.1 Operational Calibration Records

Operational calibration records will document the calibration of instruments and equipment that are corrected on an operational basis. Such calibration generally consists of determining instrumental response against compounds of known composition and concentration or the preparation of a standard response curve of the same compound at different concentrations. Records of these calibrations are maintained in the following documents:

- Standard preparation information, to trace the standards to the original source solution of neat compound, is maintained in LIMS or laboratory standard preparation logs.
- Instrument logbook provides an ongoing record of the calibration for a specific instrument. The logbook should be indexed in the laboratory operations records and should be maintained at the instrument by the chemist. The chemist must sign and date all entries, and the QM or his designee must review them.
- For NYSDEC Category B data packages, copies of the raw calibration data will be kept with the analytical sample data so the results can readily be processed and verified as one complete data package. If samples from several projects are processed together, the calibration data is copied and included with each group of data. The laboratory will maintain all calibration, analysis, and corrective action documentation (both hard copy and electronic data) for a minimum of 7 years. The documentation maintained must be sufficient to show all factors used to derive the final (reported) value for each sample. Documentation must include all calculation factors such as dilution factor, sample aliquot size, and dry-weight conversion for solid samples. The individual who performs hand calculations must sign and date them. This documentation must be stored with the raw data. Calculations performed by the data system will be documented and stored as electronic and hard copy data. The instrument printouts will be kept on file, and the electronic data will be stored by the laboratory for a minimum of 7 years.

6.3.2 Maintenance Records

Maintenance records will be used to document maintenance activities, service procedures, and schedules. They must be traceable to each analytical instrument, tool, or gauge. The individual responsible for the instrument must review, maintain, and file these records. These records may be audited by the QAO to verify compliance. Logs must be established to record and control maintenance and service procedures and schedules.

6.3.3 Nonconformance Memos

Nonconformance Memos (NCM) may be either a hard copy record or an electronic database record. In either case, review and release of the record must be documented by the initiator, the analytical group leader where appropriate, the laboratory project manager (LPM), and the laboratory QA manager. All internal laboratory nonconformance documentation will be communicated to the Field Team Leader by the laboratory project manager verbally and summarized in the report narrative. The NCM will be used to document equipment that fails calibration and will identify any corrective actions taken.

6.3.4 Corrective Action Request (CAR) Forms

The laboratory must use CAR forms to document any incidents requiring corrective action. The CAR form will be issued to the personnel responsible for the affected item or activity. A copy will also be submitted to the LPM. The individual to whom the CAR is addressed will return the requested response promptly to the QA personnel and will affix his or her signature and date to the corrective action block after stating the cause of the conditions and corrective action to be taken. QA personnel will maintain a log for status of CAR forms to confirm the adequacy of the intended corrective action and to verify its implementation. CARs will be retained in the project record file.

6.3.5 Analytical Data Reports

Analytical data will be reported as an EDD and as an analytical data package. The analytical laboratories are required to submit all data, preliminary and final, in formatted EDDs in accordance with NYSDEC's requirements. The laboratory must meet 100% compliance with these requirements. The Parsons Database Manager will submit written requests dictating the requirements and appropriate files to be supplied by the laboratory. The specifications of the EDD are presented in Section 5. EDDs are required for this project for all data collected regardless of whether the data will be validated or not.

Analytical data reports will be provided by the laboratory within 28 calendar days following receipt of a complete Sample Delivery Group (SDG) and will include the specifications identified in Attachment 3. An SDG is considered to include all samples received for the same project or site, to a maximum of twenty investigative samples not to exceed 5 consecutive days of sampling. The data package provided by the laboratory will be Level IV data in the NYSDEC ASP Category B format for all data requiring validation, unless an alternative requirement is specified in a laboratory statement of work (SOW) and will contain all information to support the data validation in accordance with the USEPA Region II SOPs and NYSDEC Guidelines for Sampling and Analysis of PFAS as described in Section 9. Additionally, the completed copies of the COC records, accompanying each sample from the time of initial bottle preparation to completion of analysis, must be attached to the analytical reports.

6.4 DATA VALIDATION AND AUDIT RECORDS

Data validation personnel are responsible for documenting validation procedures and results in the form of a data usability summary report (DUSR). The QAO will be responsible for maintaining this report and the QAO will be responsible for its distribution. Additionally, audit reports will be prepared and distributed by the QAO. A brief description of each record is described below.

6.4.1 Data Usability Summary Reports

The DUSR will be prepared as required by NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, Appendix 2B, May, 2010. The DUSR will summarize the impacts of using data that do not achieve overall data quality objectives or that do not meet PARCC and sensitivity criteria identified in Section 3.2. Additionally, the report will be used to identify, assess and present issues associated with the overall data.

6.4.2 Audit Reports

Among other QA audit reports, which may be generated during the conduct of activities, a final audit report for this project may be prepared by the QAO. The report will include:

- Periodic assessment of measurement data accuracy, precision, and completeness
- Results of performance audits and/or system audits
- Significant QA problems and recommended solutions for future projects

Status of solutions to any problems previously identified.

SECTION 7 ANALYTICAL PROCEDURES

7.1 INTRODUCTION

To meet program specific regulatory requirements for chemicals of concern, all methods will be followed as stated, with some specific requirements noted below. Chemical analyses for inorganics, organics, and wet chemistry parameters will be conducted in accordance with the QAPP, Work Assignment Scoping Documents, laboratory's SOPs (maintained "on-file" at the laboratory), and with referenced analytical methods including USEPA SW846 Test Methods for Evaluating Solid Waste, Physical, and Chemical (USEPA, 1997), and Methods for Chemical Analysis of Water and Wastes (USEPA, 1983). Where requirements conflict, the technical and QA/QC requirements in this QAPP, or the Work Assignment Scoping Documents take precedence.

7.2 STANDARD OPERATING PROCEDURES

Standard Operating Procedures (SOPs) are a written step-by-step description of laboratory operating procedures exclusive of analytical methods. Laboratories providing analytical support for this project will be required to document all procedures in SOPs. The SOPs must address the following areas:

- Storage containers and sample preservatives
- Sample receipt and logging
- Sample custody
- Sample handling procedures
- Sample transportation
- Glassware cleaning
- Laboratory security
- QC procedures and criteria
- Equipment calibration and maintenance
- Documentation
- Safety
- Data handling procedures
- Document control
- Personnel training and documentation
- Sample and extract storage
- Preventing sample contamination
- Traceability of standards
- Data reduction and validation
- Maintaining instrument records and logbooks
- Nonconformance
- Corrective actions
- Records management

SECTION 8 QUALITY CONTROL

8.1 INTRODUCTION

A QC program is a systematic process that controls the validity of analytical results by measuring the accuracy and precision of method and matrix, developing expected control limits, using these to detect anomalous events, and requiring corrective action techniques to prevent or minimize the recurrence of these events. QC measurements for analytical protocols are designed to evaluate laboratory performance, and measurement biases resulting from the sample matrix and field performance.

- **Field performance:** QC samples are used to evaluate the effectiveness of the sampling program to obtain representative samples, eliminating any cross contamination. These samples will include trip blanks, field duplicates and rinse blanks.
- **Sample performance:** Factors associated with sample preparation and analysis influence accuracy and precision. Such factors are monitored by the use of internal QC samples. QC field samples are analyzed to evaluate measurement bias due to the sample matrix based on evaluation of matrix spike (MS) and matrix spike duplicate (MSD) samples. If acceptance criteria are not met, matrix interferences are confirmed either by reanalysis or by inspection of the LCS results to verify that laboratory method performance is in control. Data are reported with appropriate qualifiers or discussion.
- **Laboratory method performance:** All QC criteria for method performance should be met for all target analytes for data to be reported. These criteria generally apply to instrument detector assessment (such as, tunes, inductively coupled plasma (ICP) interference check sample), calibration, method blanks, and LCS. Variances will be documented and noted in the case narrative of the report.

8.1.1 Field Quality Control Samples

QC samples will be collected in the field as part of the sampling program to allow evaluation of data quality. Field QA/QC samples will consist of the collection and analysis of field blanks, equipment rinse blanks, field duplicates, and matrix spike/matrix spike duplicate (MS/MSD) samples, at a frequency of 1:20 for each sample media. Temperature blanks will accompany each sample shipment container (cooler) shipped to the laboratory for sample analysis (water and soil). An equipment rinse blank will be collected from disposable sampling equipment at a frequency of once per lot. For PFAS sampling, equipment rinse blanks and field blanks will be collected in accordance to the NYSDEC Guidelines for Sampling and Analysis of PFAS presented in Attachment 1. Standard sample identifiers will identify field QA/QC samples and they may provide no indication of their nature as QA/QC samples.

A summary of the type and collection frequency of field QC samples to be collected respective to the sampling programs specified in this QAPP, is included in Tables 8.1 and 8.2. A description of each QC sample is included below.

8.1.1.1 Equipment Rinse Blanks

To assess field sampling and decontamination performance, equipment rinse blanks will be used to evaluate the effectiveness of the decontamination procedures for chemical sampling equipment. Equipment rinse blanks will be collected as part of all chemical sampling programs, except for vapor intrusion (air) and waste characterization samples. For groundwater and surface water sampling, an equipment rinse blank is a sample of deionized water provided by the laboratory that is poured over or through the sampling equipment (e.g., stainless steel spoon, tubing, etc.) into the sample container. An equipment rinse blank will be collected at a frequency of 1:20 samples per type of sample collection activity using non-disposable sampling equipment. An equipment rinse blank will be collected from disposable sampling equipment at a frequency of once per lot. For aqueous PFAS sampling, equipment rinse blanks will be collected daily using laboratory supplied PFAS-free water.

8.1.1.2 Field Duplicates

Coded (blind) field duplicates will be used to assess the precision of field sampling procedures. Precision of a sample is calculated by quantifying the RPD between two sample measurements (Section 3.2.2.1). If the RPD of field duplicate results is greater than the precision criterion, environmental results for the field duplicate pair will be qualified as estimated. The Field Leader responsible for sample collection and processing should be notified to identify the source of variability (if possible), and corrective action should be taken (Section 10.3).

Coded (blind) field duplicates will be collected to evaluate the representativeness and effectiveness of homogenization and proper mixing for soil and aqueous samples and to assess sampling errors for vapor intrusion samples. The field duplicate will be analyzed for all of the parameters for which the associated samples are being analyzed. The samples will be labeled in such a manner that the laboratory will not be able to identify the sample as a duplicate sample. This will eliminate bias that could arise by laboratory personnel.

8.1.1.3 Trip Blanks

During field sampling and sample shipping, contamination may be introduced to the samples that could affect the accuracy of analysis results. Trip blanks will be used during shipment of aqueous samples to detect cross-contamination. Each cooler of aqueous samples sent to the laboratory for analysis of VOCs will contain one trip blank. Trip blanks are prepared only when VOCs samples are taken and are analyzed for VOCs analytes. The trip blank consists of a VOC sample vial filled in the laboratory with American Society for Testing and Materials (ASTM) Type II reagent grade water, transported to the sampling site, handled like an environmental sample, and returned to the laboratory for analysis. Trip blanks are not opened in the field.

8.1.1.4 Field Blank

The primary purpose of this type of blank is to provide an additional check on possible sources of contamination. A field blank serves a similar purpose as a trip blank regarding water quality and sample bottle preparation. However, it is primarily used to indicate potential contamination from ambient air as well as from sampling instruments used to collect and transfer samples from point of collection into sample containers. If field blanks are required for PFAS sampling in the Work Assignment Scoping Documents, then the field blank will be collected using laboratory supplied PFAS-free water.

8.1.1.5 Temperature Blank

The temperature blank is used to indicate the temperature of the sample cooler upon receipt at the laboratory. A temperature blank consists of laboratory reagent in a 40-ml glass vial sealed with a Teflon® septum. Any cooler temperature exceeding the allowable 4 ± 2 °C must be noted and the QAO notified prior to sample analyses. Temperature blanks do not apply for the onsite laboratory.

8.1.2 Laboratory Quality Control Samples

QC data from the laboratory are necessary to determine precision and accuracy of the analyses and to demonstrate the absence of interferences and contamination of glassware and reagents. The laboratory will analyze QC samples routinely as part of the laboratory QC procedures. Laboratory QC results will consist of analysis of MS/MSD, LCS, method/preparation blanks, and surrogate spikes. The frequency of the analysis of laboratory QC is summarized in Table 8.3. QC samples will be prepared and analyzed utilizing the same preparation and analysis procedures as the field samples. These laboratory QC sample analyses will be run independently of the field QC samples. Results of these analyses will be reported with the sample data and kept in the project QC data file.

QC samples will be prepared and analyzed utilizing the same preparation and analysis procedures as the field samples. Re-preparation and/or reanalysis of the laboratory QC samples due to a failing recovery and/or precision failure without the re-preparation and reanalysis of the associated samples is prohibited. In all events, QC failures, holding time exceedances, or any other non-standard occurrence must be communicated immediately to the QAO and prior to reporting and then, with approval to report the data, summarized in the case narrative. If the criteria are not met, appropriate corrective action must be taken as specified in Section 9.1 and Section 10.

8.1.2.1 Matrix Spike/Matrix Spike Duplicate/ Matrix Duplicates

MS/MSD samples for organics, metals, and wet chemistry parameters will be taken at a frequency of 1 per 20 field samples (per SDG) per matrix per method. A "batch" is considered up to twenty samples from the same matrix, of the same extraction/digestion type, prepared and/or analyzed by a given analyst, within 12-hr, within an extraction/digestion event, whichever is more frequent. These samples are used to assess the effect of the sample matrix on the recovery of target compounds or target analytes by spiking a normal field sample with a known concentration of the analyte of interest. Samples identified as blanks (e.g., trip blank, field blank, equipment rinse blank) will not be used for the MS/MSD preparation or analysis.

Spiked samples will be analyzed, and the percent recovery will be calculated. Results of the analysis will be used to evaluate accuracy and precision of the actual sample matrix. For MS/MSD, the result will be compared and used to evaluate the precision of the actual sample matrix. The percent recovery for each analyte in the MS and MSD should fall within the limits established by laboratory QC protocol.

The original sample, MS, and MSD sample aliquots will be treated exactly the same throughout the sample preparation and analysis and will not be homogenized more than any other project sample (either in the field or at the laboratory). The spike samples will be analyzed for the same parameters as the sample. Field personnel must indicate on the COC form which sample(s) are designated as MS/MSD. If samples are not designated for these QC purposes and/or insufficient sample is available the Project Manager and/or QAO will be notified for resolution.

8.1.2.2 Laboratory Control Samples

Laboratory Control Samples (LCS) are designed to check the accuracy of the analytical procedure by measuring a known concentration of an analyte of interest. An LCS will be analyzed for each analytical batch requested for sample preparation and analysis. LCSs must be prepared at a frequency of one per batch for all analytical methods. If high LCS recoveries are observed and the associated samples are reported as "not detected" for the requested target analytes, no action is necessary other than to note the issue in the case narrative of the final analytical report.

8.1.2.3 Method and Preparation Blanks

Laboratory blank samples (also referred to as method or preparation blanks) are designed to detect contamination resulting from the laboratory environment or sample preparation procedure. Method blanks verify that method interferences caused by contaminants in solvents, reagents, glassware, or in other sample processing hardware, are known. Method blanks will be analyzed for each analytical batch using similar preparation techniques (separatory funnel and liquid/liquid extraction) to assess possible contamination and evaluate which corrective measures may be taken, if necessary.

Method blanks associated with field samples must undergo all of the processes performed on investigative samples, including but not limited to pre-filtration and sample cleanups. The blank will be deionized water for water samples or a purified solid matrix such as sodium sulfate for extractable soil samples. Where all the field samples in a batch do not require an additional cleanup procedure, an additional blank may be prepared to check the performance of the additional cleanup and will be associated with the field samples getting the specific additional cleanup. Where this is done, both blanks will be reported, and the procedure described in the case narrative. Method blanks must be prepared at a frequency of one per analytical batch.

8.1.2.4 Surrogate Spike Analyses

Surrogate spikes (applicable to organic analysis only) are used to determine the efficiency of analyte recovery in sample preparation and analysis. Calculated percent recovery of the spikes is used to measure the accuracy of the analytical method. A surrogate spike is prepared by adding a known amount of a compound similar in type to the analytes of interest. Surrogate compounds will be added to all samples analyzed by USEPA Methods, including method blanks, MS/MSDs, project environmental samples, and duplicate samples in accordance with the method.

8.2 INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

8.2.1 Field Equipment

Equipment failure will be minimized by routinely inspecting all field equipment to ensure that it is operational and by performing preventative maintenance procedures. Field sampling equipment will be inspected prior to sample collection activities, and repairs will be made prior to decontamination and reuse of the sampling equipment. PFAS-specific requirements for field sampling equipment are described in the FAP and NYSDEC guidance in Attachment 2. Equipment, instruments, tools, gauges, and other items requiring preventive maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedure, based on the manufacturer’s instructions or recommendations. Maintenance will be performed in accordance with the schedule specified by the manufacturer to minimize the downtime of the measurement system. Qualified personnel must perform maintenance work.

MINIMUM ROUTINE PREVENTIVE MAINTENANCE
Removal of foreign debris from exposed surfaces Storage in a cool dry place protected from the elements Daily inspections Verification of instrument calibrations (Section 8.3.1)

A list of critical spare parts will be developed prior to the initiation of fieldwork. Field personnel will have ready access to critical spare parts to minimize downtime while fieldwork is in progress. A service contract for rapid instrument repair or backup instruments may be substituted for the spare part inventory.

Non-routine maintenance procedures require field equipment to be inspected prior to initiation of fieldwork to determine whether or not it is operational. If it is not operational, it will be serviced or replaced. Batteries will be fully charged or fresh, as applicable.

8.2.2 Laboratory Instrumentation

Periodic preventive maintenance is required for all sensitive equipment. Instrument manuals will be kept on file for reference if equipment needs repair. The troubleshooting section of factory manuals may be used in assisting personnel in performing maintenance tasks.

Major instruments in the laboratory are covered by annual service contracts with manufacturers or other qualified personnel (internal or external). Under these agreements, trained service personnel make regular preventive maintenance visits. Maintenance is documented and maintained in permanent records by the individual responsible for each instrument.

The laboratory manager is responsible for preparation, documentation, and implementation of the program. The laboratory QA manger reviews implementation to verify compliance during scheduled internal audits.

Written procedures will establish the schedule for servicing critical items to minimize the downtime of the measurement system. The laboratory will adhere to the maintenance schedule and arrange any necessary and prompt service. Qualified personnel will perform required service.

8.3 INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

Instruments (field and laboratory) used to perform chemical measurements will be properly calibrated prior to use to obtain valid and usable results. The requirement to properly calibrate instruments prior to use applies equally to field instruments as it does to fixed laboratory instruments to generate appropriate data to meet DQOs.

8.3.1 Field Instruments

All field analytical equipment will be calibrated immediately prior to each day's use. The calibration procedures of field instruments (such as PID, pH, temperature), will conform to manufacturer's standard instructions to ensure that the equipment functions within the allowable tolerances established by the manufacturer and required by the project. Personnel performing instrument calibrations must be trained in its proper operation and calibration. Records of all instrument calibration will be maintained by the Field Team Leader in the field log (Section 6.2) and will be subject to audit by the QAO or authorized personnel. The Field Team Leader will maintain copies of all the instrument manuals on the site.

8.3.2 Laboratory Instruments

A formal calibration program will control instruments and equipment used in the laboratory. The program will verify that equipment is of the proper type, range, accuracy, and precision to provide data compatible with specified requirements. Instruments and equipment that measure a quantity or whose performance is expected at a stated level will be subject to calibration. Laboratory personnel or external calibration agencies or equipment manufacturers will calibrate the instruments using reference standards. Upon request, the laboratory will provide all data and information to demonstrate that the analytical system was properly calibrated at the time of analysis including calibration method, frequency, source of standards, concentration of standards, response factors, linear range, check standards, and all control limits. This data will be documented in a calibration record

(Section 6.3.1). Calibration records will be prepared and maintained for each piece of equipment subject to calibration.

This section provides an overview of the practices used by the laboratory to implement a calibration program. Detailed calibration procedures, calibration frequencies, and acceptance criteria are specified in the laboratory's analytical method SOPs. The requirements for the calibration of instruments and equipment depend on the type and expected performance of individual instruments and equipment. Therefore, the laboratory will use the guidelines provided here to develop a calibration program.

Two types of calibration are described in this section: periodic calibration and operational calibration. The results of the calibration activities will be documented in the analytical data package and the calibration records (Section 6.3.1).

- **Periodic calibration:** Performed at prescribed intervals for equipment, such as balances and thermometers. In general, equipment which can be calibrated periodically is a distinct, singular purpose unit and is relatively stable in performance.
- **Operational calibration:** routinely performed as part of an analytical procedure or test method, such as the development of a standard curve for use with an atomic absorption spectrophotometer. Operational calibration is generally performed for instrument systems.

Equipment that cannot be calibrated or becomes inoperable will be removed from service. Such equipment must be repaired and satisfactorily recalibrated before reuse. For equipment that fails calibration, analysis cannot proceed until appropriate corrective action is taken, and the analyst achieves an acceptable calibration. This type of failure will be documented in an NCM (Section 10).

8.3.3 Calibration System

The calibration system includes calibration procedures, equipment identification, calibration frequency, calibration reference standards, calibration failure, and calibration records. These elements are described next.

8.3.3.1 Calibration Procedures

Written procedures will be used by the laboratory for all instruments and equipment subject to calibration. Whenever possible, recognized procedures, such as those published by ASTM or USEPA, will be adopted. If established procedures are not available, a procedure will be developed considering the type of equipment, stability characteristics of the equipment, required accuracy, and the effect of operational error on the quantities measured. Calibration procedure established by the laboratory must, at a minimum, meet the calibration requirements of the method on which the SOP is based.

MINIMUM CALIBRATION PROCEDURES
Equipment to be calibrated Reference standards used for calibration Calibration technique and sequential actions Acceptable performance tolerances Frequency of calibration Calibration documentation format

8.3.3.2 Equipment Identification

Equipment that is subject to calibration is identified by a unique number assigned by the laboratory. Calibration records reference the specific instrument identification.

8.3.3.3 Calibration Frequency

Instruments and equipment will be calibrated at prescribed intervals and/or as part of the operational use of the equipment. Calibration frequency will be based on the type of equipment, inherent stability, manufacturer's recommendations, values provided in recognized standards, intended data use, specified analytical methods, effect of error upon the measurement process, and prior experience.

8.3.3.4 Calibration Reference Standards

Two types of reference standards will be used by the laboratory for calibration:

- **Physical standards**, such as weights for calibrating balances and certified thermometers for calibrating working thermometers, refrigerators and ovens, are generally used for periodic calibration. Physical reference standards that have known relationships to nationally recognized standards (such as NIST) or accepted values of natural physical constants will be used whenever possible. If national standards do not exist, the basis for the reference will be documented. Physical reference standards will be used only for calibration and will be stored separately from equipment used in analyses. In general, physical standards will be recalibrated annually by a certified external agency, and documentation will be maintained. Balances will be calibrated against class "S" weights by an outside source annually. Physical standards such as the laboratory's class "S" weights will be recertified annually.
- **Chemical standards,** such as vendor certified stock solutions and neat compounds, will generally be used for operational calibration. The laboratory, to provide traceability for all standards used for calibration and QC samples, will document standard preparation activities.

8.3.4 Operational Calibration

Operational calibration will generally be performed as part of the analytical procedure and will refer to those operations in which instrument response (in its broadest interpretation) is related to analyte concentration. Formulas used for calibration are listed in Table 8.4.

8.3.4.1 Preparation of a Calibration Curve

Preparation of a standard calibration curve will be accomplished by analyzing calibration standards that are prepared by adding the analyte(s) of interest to the solvent that is introduced into the instrument. The concentrations of the calibration standards will be chosen to cover the working range of the instrument or method. All sample measurements will be made within this working range. Average response factors will be used or a calibration curve will be prepared by plotting or regressing the instrument responses versus the analyte concentrations. Where appropriate a best-fit curve may be used for nonlinear curves and the concentrations of the analyzed samples will be back-calculated from the calibration curve.

8.3.4.2 Periodic Calibration

Periodic calibrations are performed for equipment (such as balances and thermometers), that is required in the analytical method, but that is not routinely calibrated as part of the analytical procedure. Table 8.5 lists the periodic calibration requirements used by the laboratories.

8.4 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

In the laboratory, personnel qualifying reagents and standards must be trained to perform the associated instrumental analysis, including instrument calibration, calculations, and data interpretation. Laboratory personnel must document the purchase, receipt, handling, storage, and tracking of supplies and consumables used during analysis. For example, analytical standards, source materials, and reference materials used for instrumental calibration/tunes/checks must be certified and traceable to the USEPA or NIST through reference numbers documented directly in each analytical sequence. Calibration for all requested analyses must be verified by an independent second source reference. Adhering to these procedures precludes the use of expired supplies and consumables or supplies and consumables that do not meet standard acceptance criteria.

Records must be maintained on reagent and standard preparation in the LIMS reagent system or laboratory standard preparation logs. The records should indicate traceability of the standards to their original source solution or neat compound, the name of the material, concentration, the method and date of preparation, the expiration date, storage conditions, and the preparer’s initials. Each prepared reagent or standard should be labeled with a unique identifier that links the solution to the preparation documentation that specifies an expiration and/or re-evaluation date for the solution.

SECTION 9 DATA VALIDATION AND USABILITY ELEMENTS

9.1 DATA REVIEW, VERIFICATION, AND VALIDATION

The data collected during this project will undergo a systematic review for compliance with the DQOs and performance objectives as stated in Section 3. In particular, field, laboratory, and data management activities will be reviewed to confirm compliance with the method QC criteria for performance and accuracy and to show that data were collected in a manner that is appropriate for accomplishing the project objectives. These data will be evaluated as to their usability during data verification. In particular, data outside QC criteria, but not rejected, will be reviewed for possible high and low bias. All data will be validated following verification and reduction.

Qualified data validation personnel will assess and verify data; they will review the data against QC criteria, DQOs (Sections 3 and 9.2.2), analytical method, USEPA Region 2 SOPs for data review, and NYSDEC guidelines (NYSDEC, 2020) to identify outliers or errors and to flag suspect values. Field and laboratory activities that should be reviewed include, at a minimum, sample collection, handling, and processing techniques; field documentation records; verification of proper analytical methods; analytical results of QC samples; and calibration records for laboratory instruments and field equipment. A review of such elements is necessary to demonstrate whether the DQOs outlined in 3 were met. Samples that deviate from the experimental design and affect the project objectives must be reported to the QAO and data validation personnel.

Departures from standard procedures in this QAPP, or the laboratory SOPs, may lead to exclusion of that data from the project database or validation process, based on discussions with and approval of the NYSDEC. However, routine field audits involving thorough reviews of sample collection procedures and sample documentation should preclude such deviations from occurring. Additionally, routine laboratory audits will be used to document proper sample receipt, storage, and analysis; instrument calibration; use of the proper analytical methods; and use of QC samples specified in Section 8 to assist in appropriately qualifying the data.

The laboratory's analytical report for each sample delivery group (SDG) will be assembled by collecting and incorporating all the data for each analysis associated with the reported samples; the analytical narratives; and other report-related information such as copies of COC forms, communication records, and nonconformance forms. The information included in the analytical data report is summarized in Attachment 3.

Before the laboratory submits data, the laboratory's data review process will include a full first level "technical" review by the laboratory's analyst during sample analysis and data generation. The review must include a check of all QC data for errors in transcription, calculations, and dilution factors and for compliance with QC requirements. Failure to meet method performance QC criteria may result in the reanalysis of the sample or analytical batch. After the initial review is completed, the data will be collected from summary sheets, workbooks, or computer files and assembled into a data package.

The laboratory's first review will be followed by a second-level technical review of the data package. The second level review may be performed by a peer trained in the procedures being reviewed or by the appropriate analytical group supervisor. The reviewer will check the data packages for completeness and compliancy with the project requirements and will certify that the report meets the DQOs for PARCCS specifications. The report narrative will be generated at this stage of the data review. Any problems discovered during the review and the corrective actions necessary to resolve them will be communicated to the responsible individual, who will discuss the findings with the laboratory QA manager for resolution.

The first and second review will be conducted throughout sample analysis and data generation to validate data integrity during collection and reporting of analytical data. Data review checklists will be used to document the performance and review of the QC and analytical data.

Before the laboratory's final release to the client, the data will undergo a final review by the laboratory's QA officer or his/her designee. This third level review is to confirm that the report is complete and meets project requirements for performance and documentation. The laboratory's QA officer must review reports involving non-conforming data issues. A summary of all non-conformances will be included in the case narrative. The report will then be released to the client for data validation, and a copy will be archived by the laboratory for a period of 7 yrs.

The laboratory analytical data will be validated using project-specific data validation procedures to confirm that data meet the applicable data quality objectives. Depending on the type of data and the intended data uses, the data validation process for a given SDG (or a specific percentage of sample analyses) or analytical method may be performed following a Level IV protocol (full validation), or a Level III protocol (sample plus QC summary data only, no raw data review). The project-specific Level III data validation protocol will provide a level of review resulting in the generation of a DUSR, as defined by NYSDEC DER-10 requirements. Level III validation will be performed on all DQO Level III and all DQO Level IV data. Ten percent (10%) of the DQO Level IV Data for each analytical method will undergo a Level IV validation. Certain geotechnical and field screening data may be evaluated in a manner suitable for the intended data uses.

A data validation report will be issued and reviewed by the QAO before finalization. The data validation report will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and COC procedures, and a summary assessment of PARCCS criteria for each analytical method. The validation criteria are objective and are not sample dependent, except for consideration of sample matrix effects. The criteria specify performance requirements that should be under the control of the field-sampling contractor or analytical laboratory. This QAPP will be the primary reference for evaluating the data.

After data validation, the data will be evaluated for consistency with site conditions and developed conceptual models. Data validation personnel will prepare a project DUSR that summarizes the implications of the use of any data out of criteria. In addition, the data usability report will include the percentage of sample completeness for critical and non-critical samples and a discussion of any issues in representativeness of the data that may develop as a result of validation. The data usability report will address overall data quality and achievement of PARCCS criteria and assess issues associated with the overall data and data quality for all validated Level III and Level IV data.

9.2 VERIFICATION AND VALIDATION METHODS

9.2.1 Laboratory

The laboratory will verify and assess analytical data against the stated requirements on the COC record, the sample handling procedures (Section 4), and the QC parameters. The laboratory data reviewers will also check that transcriptions of raw or final data and calculations were performed correctly and are verified.

Following data verification, analytical data generated by the laboratory will be reduced and managed based on the procedures specified in this QAPP and analytical methodologies. Data reduction includes all processes that change either the values or numbers of data items. The data reduction processes used in the laboratory includes establishment of calibration curves, calculation of sample concentrations from instrument responses, and computation of QC parameters. Table 9.1 lists the formulas used to calculate sample concentrations.

The reduction of instrument responses to sample concentrations takes different forms for different types of methods. For most analyses, the sample concentrations are calculated from the measured instrument responses using a calibration curve. The sample concentrations can be back-calculated from a regression equation fitted to calibration data. For gravimetric and titrimetric analyses, the calculations are performed according to equations given in the method. For chromatographic analyses, the unknown concentrations are determined using either calibration factors (external standard procedure) or relative response factors (internal standard procedure). GC analyses are generally quantitated using the external standard technique; GC/MS analyses are quantitated using the internal standard technique. These calculations are generally performed by the associated computerized data systems.

Validated analytical data will be loaded into a database and reported in tabular format. Database fields will include the field sample identification, laboratory sample identification, blinded sample number, analytical results, detection limits, and validation qualifiers. The usability of the data will be evaluated by the QAO or designee.

9.2.2 Analytical Data Validation

The data review process is performed in two phases:

1. **Initial phase, contract compliance screening (CCS)**: Review of sample data deliverables for completeness. Completeness is evaluated by ensuring that all required data deliverables are received in a legible format with all required information. The CCS process also includes a review of the COC forms, case narratives, and RLs. Sample resubmission requests, documentation of nonconformances with respect to data deliverable completeness, and corrective actions often are initiated during the CCS review. The results of the CCS process are incorporated into the data validation process.
2. **Second phase, data validation:** A project-specific data validation procedure based on a “Level III” or the “Level IV” validation protocol will be performed on the analytical results from the fixed-base laboratory or laboratories, with the exception of the bench-scale testing data. The Level III validation protocol, which be applied to Level III data packages and Level IV data packages not receiving “full” Level IV validation includes a review of summary information to determine adherence to analytical holding times; results from analysis of field duplicates, method blanks, field blanks, surrogate spikes, MS/MSDs, LCSs, and sample temperatures during shipping and storage. Data qualifiers are applied to analytical results during the data validation process based on adherence to method protocols and laboratory-specific QA/QC limits. The Level IV validation protocol incorporates the Level III validation protocol and adds calculation checks from the raw data of reported and summarized sample data and QC results.

The laboratory will send the required analytical data package deliverables, consisting of hardcopy versions and the EDD, following completion of the laboratory’s validation process (Section 9.2.2). Data validation will be performed in accordance with the USEPA **Region 2 Data Validation SOPs** for organic and inorganic data review (USEPA, 2016a, 2016b, 2016c, 2016d, 2016e). In addition, Parsons will refer to this QAPP and the Work Assignment Scoping Documents to verify that DQOs were met. If problems are identified during data validation, the QAO and the laboratory QA manager will be alerted, and corrective actions will be requested. The LPM and data validation chemists will maintain close contact with the QAO to ensure all nonconformance issues are acted upon prior to data manipulation and assessment routines.

Data validation will be conducted using the USEPA guidelines (USEPA, 2017a, 2017b) as supplementary guidelines. Where USEPA guidelines and SW-846 disagree, this QAPP and data validation professional judgment will prevail.

FULL VALIDATION (USEPA LEVEL IV EQUIVALENT)	
Organic Analytical Methods	**Inorganic Constituents, Wet Chemistry Parameters**
Percentage of solids Sample preservation and holding times Instrument tuning Instrument calibrations Blank results System monitoring compounds or surrogate recovery compounds (as applicable) Internal standard recovery results MS and MSD results LCS results Target compound identification Chromatogram quality Duplicate results Compound quantitation and reported RLs System performance and Results verification	Percentage of solids Sample preservation and holding times Calibrations Blank results Interference check samples (inorganics only) LCSs Project Required Reporting Limit (PRRL) standard check samples Duplicates MSs (pre-digestions and post-digestions for inorganics only) ICP serial dilutions and Results verification and reported detection limits

Trained and experienced data validation chemists will perform the data validation work. The QAO will review the data validation report before it is finalized. The data validation report will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and COC procedures, and a summary assessment of PARCCS criteria for each analytical method. A detailed assessment of each SDG will follow. Based on the results of data validation, the validated analytical results reported will be assigned a usability flag (see chart below).

USABILITY FLAGS FOR VALIDATED RESULTS	
U	Not detected at given value
UJ	Analyte not detected; associated quantitation limit is an approximate (estimated) values.
J	Estimated value
J+	Estimated biased high
J-	Estimated biased low
N	Presumptive evidence at the value given
NJ	Analysis indicates presence of analyte tentatively identified; the associated numerical value is its approximate concentration
R	Result not useable and
No flag	Result accepted without qualification

9.3 RECONCILIATION WITH USER REQUIREMENTS

Following data validation by qualified personnel, the data will be evaluated by the QAO and the project manager as to consistency with site conditions and developed conceptual models to determine whether field and analytical data meet the requirements for decision making. Specifically, the results of the measurements will be compared to the DQOs (Section 3).

The DQOs will be considered complete and satisfied if the data are identified as usable and if no major data gaps are identified. For example, the objective for data collected under the characterization program is to further refine the limits of dredging and/or capping. If the collected data sufficiently characterizes these limits in a manner that is acceptable for remedial action, then the DQO is satisfied. In cases where data may be considered not usable (for example, rejected during data validation), resampling may be required at a specific location. If resampling is not possible, the data will be identified and noted in the project database to make data users aware of its limitations.

SECTION 10 ASSESSMENT AND OVERSIGHT

10.1 ASSESSMENTS AND RESPONSE ACTIONS

Performance and system audits of both field and laboratory activities may be performed. Any such audits will be performed at a frequency to be determined to ensure that sampling and analysis activities are completed in accordance with the procedures specified in field sampling SOPs included by attachment to this QAPP and the contents of this QAPP itself.

Quality assurance audits will be carried out under the direction of the QAO on field activities, including sampling and field measurements. They will be implemented to verify that established procedures are being followed and to evaluate the capability and performance of project and subcontractor personnel, items, activities, and documentation of the measurement system(s).

The QAO will plan, schedule, and approve system and performance audits based on procedures customized to the project requirements. If required, the QAO may request additional personnel with specific expertise from company and/or project groups to assist in conducting performance audits. Quality auditing personnel will not have responsibility for field or laboratory project work.

10.2 PROJECT-SPECIFIC AUDITS

Project-specific audits include system and performance audits of sampling and analysis procedures, and of associated recordkeeping and data management procedures. Project-specific audits will be performed on a discretionary basis at a frequency determined by the project manager.

10.2.1 System Audits

The QAO may perform system audits. Such audits will encompass a qualitative evaluation of measurement system components to ascertain their appropriate selection and application. In addition, field and laboratory QC procedures and associated documentation may be system-audited including the field log, field sampling records, laboratory analytical records, sample handling, processing, and packaging in compliance with the established procedures, maintenance of QA procedures, and COC procedures. These audits may be carried out during execution of the project to confirm that sampling crews employ consistent procedures. However, if conditions adverse to quality are detected additional audits may occur.

Findings from the audit will be summarized and provided to the PM and/or designated personnel so that necessary corrective action can be monitored from initiation to closure.

10.2.2 Performance Audits

The laboratory may be required to conduct an analysis of performance evaluation (PE) samples or provide proof that PE samples were submitted by an approved USEPA or NYSDEC performance testing provider within the past 12 months. If necessary, proof that applicable PE samples have been analyzed at the laboratory within the past 12 months will be included in the laboratory procurement package.

10.2.3 Formal Audits

Formal audits are any system or performance audit that the QAO documents and implements. These audits encompass documented activities performed by qualified lead auditors to a written procedure or checklist to verify objectively that QA requirements have been developed, documented, and instituted in accordance with contractual and project criteria. At the discretion of the project manager, the QAO or designated personnel may conduct formal audits on project and subcontractor work during the course of the project.

Auditors who have performed the site audit after gathering and evaluating all data will write audit reports. Items, activities, and documents determined by lead auditors to be in noncompliance must be identified at exit interviews conducted with the involved management. Noncompliance will be logged and documented through audit findings. These findings will be attached to and become part of the integral audit report. These audit-finding forms are directed to management to resolve satisfactorily the noncompliance in a specified and timely manner.

The QAO has overall responsibility to see that all corrective actions necessary to resolve audit findings are acted upon promptly and satisfactorily. Audit reports will be submitted to the PM after completion of the audit. Serious deficiencies will be reported to the PM on an expedited basis. Audit checklists, audit reports, audit findings, and acceptable resolutions will be approved by the QAO prior to issue. Verification of acceptable resolutions may be determined by re-audit or documented surveillance of the item or activity. Upon verification acceptance, the QAO will close out the audit report and findings.

10.2.4 Laboratory Audits

Internal laboratory audits will be performed routinely to review and evaluate the adequacy and effectiveness of the laboratory's performance and QA program, to ascertain if the QAPP is being completely and uniformly implemented, to identify nonconformances, and to verify that identified deficiencies are corrected. The laboratory QA manager is responsible for such audits and will perform them according to a schedule planned to coincide with appropriate activities on the project schedule and sampling plans. Such scheduled audits may be supplemented by additional audits for one or more of the following reasons:

- When significant changes are made in the QAPP
- When necessary to verify that corrective action has been taken on a nonconformance reported in a previous audit
- When requested by the laboratory's project manager or QA manager.

10.2.4.1 Laboratory Performance Audits

Performance audits are independent sample checks made by a supervisor or auditor to arrive at a quantitative measure of the quality of the data produced by one section or the entire measurement process. Performance audits are conducted by introducing control samples, in addition to those used routinely, into the data production process. These control samples include PE samples of known concentrations. The results of performance audits will be evaluated against acceptance criteria. The results will be summarized and maintained by the laboratory QA manager and distributed to the supervisors who must investigate and respond to any results that are outside control limits.

10.2.4.2 Laboratory Internal Audits

The laboratory QA manager conducts routine internal audits of each laboratory section for completeness, accuracy, and adherence to SOPs. The laboratory audit team will verify that the laboratory's measurement systems are operated within specified acceptable control criteria and that a system is in place to confirm that out-of-control conditions are efficiently identified and corrected.

10.2.4.3 Laboratory Data Audits

The laboratory will maintain raw instrument data for sample analyses on magnetic tape media or optical media in a secured fireproof safe. During routine audits, the audit team will verify the processing of the raw data file by reviewing randomly selected electronic data files and comparing the results with the hardcopy report. Tapes will be archived for a period of 7 yr. Tapes will be also available for audit by the QAO upon request.

10.2.4.4 Laboratory Audit Procedures

Prior to an audit, the designated lead auditor will prepare an audit checklist. During an audit and upon its completion, the auditor will discuss the findings with the individuals audited and discuss and agree on corrective actions to be initiated. The auditor will prepare and submit an audit report to the designated responsible individual of the audited group, the PM, and the QAO. Minor administrative findings that can be resolved to the satisfaction of the auditor during an audit need not be cited as items requiring corrective action. Findings that are not resolved during the course of the audit and findings affecting the overall quality of the project will be included in the audit report.

The designated responsible individual of the audited group will prepare and submit to the QAO a reply to the audit. This reply will include, at a minimum, a plan for implementing the corrective action to be taken on nonconformances indicated in the audit report, the date by which such corrective action will be completed, and actions taken to prevent reoccurrence. If the corrective action has been completed, supporting documentation should be attached to the reply. The auditor will ascertain (by re-audit or other means) if appropriate and timely corrective action has been implemented.

Records of audits will be maintained in the project files. Audit files will include, as a minimum, the audit report, the reply to the audit, and any supporting documents. It is the responsibility of the designated responsible individual of the audited group to conform to the established procedures, particularly as to development and implementation of such corrective action.

10.2.4.5 Laboratory Documentation

To confirm that the previously defined scope of the individual audits is accomplished and that the audits follow established procedures, a checklist will be completed during each audit. The checklist will detail the activities to be executed and ensure that the auditing plan is accurate. Audit checklists will be prepared in advance and will be available for review.

AUDIT CHECKLIST (AT MINIMUM)
Date and type of audit
Name and title of auditor
Description of group, task, or facility being audited
Names of lead technical personnel present at audit
Checklist of audit items according to scope of audit
Deficiencies or non-conformances

Following each system, performance, and data audit, the QAO or his designee will prepare a report to document the findings of the specific audit. The report will be submitted to the designated individual of the audited group to ensure that objectives of the QA program are met.

MINIMUM CONTENT OF AUDIT REPORT
Description and date of audit
Name of auditor
Copies of completed, signed, and dated audit form and/or checklist
Summary of findings including any nonconformance or deficiencies
Date of report and appropriate signatures
Description of corrective actions

The QAO will maintain a copy of the signed and dated report for each audit. If necessary, a second copy will be placed in project files.

10.3 CORRECTIVE ACTIONS

Corrective action procedures have been established to ensure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated, and corrected. Corrective action enables significant conditions adverse to quality to be noted promptly at the site, laboratory, or subcontractor location. Additionally, it allows for the cause of the condition to be identified and corrective action to be taken to rectify the problem and to minimize the effect on the data set. Further, corrective action is intended to minimize the possibility of repetition.

Condition identification, cause, reference documents, and corrective action planned to be taken will be documented and reported to the QAO, PM, FTL, and involved subcontractor management, at a minimum. Implementation of corrective action is verified by documented follow-up action. Any project personnel may identify noncompliance issues; however, the designated QA personnel are responsible for documenting, numbering, logging, and verifying the close out action. The designated responsible individual of the audited group will be responsible for ensuring that all recommended corrective actions are implemented, documented, and approved.

Events that trigger corrective actions
When predetermined acceptance standards are not attained
When a deviation from SOP is required or observed
When procedure or data compiled are determined to be deficient
When equipment or instrumentation is found to be faulty
When samples and analytical test results are not clearly traceable
When QA requirements have been violated
When designated approvals have been circumvented
As a result of system and performance audits
As a result of a management assessment
As a result of laboratory/field comparison studies
As required by analytical method

All project personnel have the responsibility, as part of normal work duties, to promptly identify, solicit approved correction, and report conditions adverse to quality. Specifically, the laboratory must designate the assigned individual to act as the primary laboratory contact responsible for timely identification and resolution of any and all issues including contract and administrative issues. Any phone calls initiated by personnel or designated representatives to the laboratory with respect to corrective actions must be returned in a timely manner on a normal business day if the designate individual (or alternate) is not available at the initiation of the phone call.

Project management and related staff, including field investigation teams, remedial design planning personnel, and laboratory groups will monitor on-going work performance as part of daily responsibilities. Work may be audited at the site, the laboratories, or subcontractor locations. Activities or documents ascertained to be noncompliant with QA requirements will be documented. Corrective actions will be mandated through audit finding sheets attached to the audit report. Audit findings are logged, maintained, and controlled by the QAO, PM, or designated personnel.

Personnel assigned to QA functions will have the responsibility to issue and control CAR forms (Figure 10.1). The CAR identifies the out-of-compliance condition, reference document(s), and recommended corrective action(s) to be administered.

Similar to the CAR, the laboratory will record and report nonconformances internally using the laboratory's non-conformance documentation tracking system in the form of an NCM. Each NCM is traceable so that it can be cross-referenced with its resolution to the associated project records. The laboratory QA manager summarizes critical nonconformances, such as reissued reports and client complaints, in a monthly report to the laboratory management staff. Management of the NCM is described in Section 6.3. Corrective action procedures applicable to QC requirements that do not meet the criteria of this QAPP are described in the following sections. Consistent, frequent contacts between laboratory personnel, the QAO, or designated personnel are required.

TYPICAL CONTENT OF NCM FORMS
Problem description and root cause
Corrective action
Client notification summary
QA verification
Approval history action

SECTION 11 REPORTS TO MANAGEMENT

11.1 QA REPORTS

Management personnel receive QA reports appropriate to their level of responsibility. The PM receives copies of all QA documentation. QC documentation is retained within the department that generated the product or service except where this documentation is a deliverable for a specific contract. QC documentation is also submitted to the project QAO for review and approval. Previous sections detailed the QA activities and the reports, which they generate. Among other QA audit reports that may be generated during the conduct of activities, a final audit report for this project will be prepared by the QAO. The report will include:

- Periodic assessment of measurement data accuracy, precision, and completeness
- Results of performance audits and/or system audits
- Significant QA problems and recommended solutions for future projects
- Status of solutions to any problems previously identified.

Additionally, any incidents requiring corrective action will be fully documented.

SECTION 12 REFERENCES

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TABLES

TABLE 3.1 QUALITY CONTROL LIMITS

Laboratory Accuracy and Precision							
Analytical Parameters	Analytical Method	Matrix Spike (MS) Compounds	MS/MSD (a) % Recovery	MS/MSD RPD (b)	LCS (c) % Recovery	Surrogate Compounds	Surrogate % Recovery
TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

(a) Matrix Spike/Matrix Spike Duplicate
(b) Relative Percent Difference
(c) Laboratory Control Sample
TBD To be determined

TABLE 3.2 QUANTITATION LIMITS

CAS Number	Analytical Method	Parameter	NYSDEC Standard Criteria	QAPP Quantitation Limit	Units
TBD	TBD	TBD	TBD	TBD	TBD

TBD To be determined

TABLE 4.1 SAMPLE CONTAINERIZATION, PRESERVATION, AND HOLDING TIMES

Analysis	Bottle Type	Preservation [a]	Holding Time [b]
TBD	TBD	TBD	TBD

[a] All samples to be preserved in ice during collection and transport.
[b] Days from sample collection.
TBD – To be determined

TABLE 6.1
SUMMARY OF FIELD, LABORATORY, AND DATA MANAGEMENT RECORDS

- REPORT	PERSON RESPONSIBLE FOR		STORAGE
	MAINTENANCE	DISTRIBUTION	
PROJECT FILES AND FIELD SAMPLING RECORDS			
Field Log	Field Team Leader	Project Manager	Job File at Primary Contractor's Location
Photographs	Field Team Leader	Project Manager	Job File at Primary Contractor's Location
Chain-of-Custody	Field Team Leader	Project Manager	Job File at Primary Contractor's Location
Field Sampling Records	Field Team Leader	Project Manager	Job File at Primary Contractor's Location
LABORATORY RECORDS			
Reagent and Titrant Preparation Records	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Standards Preparation Logs	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Sample Preparation Logs	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Bench Data Sheets	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Instrument Run Logs	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Strip Chart Recordings/ Chromatograms/Computer Output	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Analytical Data Reports	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Log-in Sheets	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Maintenance Records	Quality Assurance Manager	Laboratory Project Manager	Instrument Maintenance Logbook at Laboratory
Periodic Calibration Records	Quality Assurance Manager	Laboratory Project Manager	QA Files at Laboratory
Operational Calibration Records	Quality Assurance Manager	Laboratory Project Manager	Job File at Laboratory
Nonconformance Memos	Quality Assurance Manager	Laboratory Project Manager	Maintained in Database File at Laboratory
Corrective Action Request Forms	Quality Assurance Manager	Laboratory Project Manager	Client Correspondence Records at Laboratory
DATA VALIDATION AND AUDIT RECORDS			
Data Validation Reports	Quality Assurance Officer	Quality Assurance Officer	Job File at Primary Contractor's Location
Audit Reports	Quality Assurance Officer	Quality Assurance Officer	Job File at Primary Contractor's Location

TABLE 8.1
SUMMARY OF FIELD QC SAMPLE TYPES AND COLLECTION FREQUENCY

Field QC Sample Type	Sample Type	Collection Frequency
Equipment Rinse Blank	Water, Soil	1:20 samples per type of sample collection activity using non-disposable sampling equipment. Once per lot for disposable sampling equipment. Daily for aqueous PFAS sampling.
Field Blank	Water, Soil	Dependent upon Work Assignment Scoping Documents.
Trip Blank	Water	One per cooler of aqueous VOC samples
Field Duplicates	Water, Soil, Air	1:20 Samples
Extra Volume Sample (collected for MS/MSD)	Water, Soil	1:20 Samples

Field QA/QC samples will be identified by using standard sample identifiers that will provide no indication of their nature as QA/QC samples.

TABLE 8.2
SAMPLING SUMMARY

Analyte	Matrix	Analytical Method	Number of Samples	Number of Field Duplicates	Number of MS/MSD Samples	Number of Trip Blanks	Number of Equipment Blanks	Number of Field Blanks
TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

TBD – To be determined.

TABLE 8.3
LABORATORY QUALITY CONTROL SAMPLE FREQUENCY

QC Sample	Frequency
Method/prep Blanks	1 per analytical batch of 1-20 samples, per preparation event
Laboratory Control Sample	1 per analytical batch of 1-20 samples, per preparation event
Surrogates	Spiked into all field and QC samples (Organic Analyses)
Matrix Spike/Matrix Spike Duplicate or Matrix (Laboratory) Duplicate	1 per batch of 1-20 samples

TABLE 8.4
OPERATIONAL CALIBRATION FORMULAS

Application	Formula	Symbols
Linear calibration curves	$C = (R - a_0)/a_1$	C = analytical concentration R = instrument response a_0 = intercept of regression curve (instrument response when concentration is zero) a_1 = slope of regression curve (change in response per change in concentration)
Calibration factors [1]	$CF = A_x / C$	C = concentration (µg/L) CF = calibration factor Ax = peak size of target compound in sample extract
Response factors [2]	$RRF = C_{is} A_x / C_x A_{is}$	C = concentration (µg/L) RF = internal standard response factor Cis = concentration of the internal standard (µg/L) Ax = area of the characteristic ion for the target compound Ais = area of the characteristic ion for the internal standard

1. Used for quantitation by the external standard technique
2. Used for quantitation by the internal standard technique

Note: For organic analysis, the laboratory will make efforts to use the best curve technique for each analyte. This practice is described in detail in the laboratory calibration criteria documents for GC analysis. This may require the use of a quadratic curve for some compounds.

TABLE 8.5

PERIODIC CALIBRATION REQUIREMENTS

Instrument	Calibration Frequency		Corrective Actions
Analytical Balances	Daily: Annually	Sensitivity (with a Class S-verified weight) Calibrated by outside vendor against certified Class S weights	Adjust sensitivity Service balance
Thermometers	Annually	Calibrated against certified NIST thermometers	Tag and remove from service
Automatic Pipettors	Quarterly:	Gravimetric check	Service or replacement

TABLE 9.1

SAMPLE CONCENTRATION CALCULATION FORMULAS

Application	Formula	Symbols
Linear regression calibration curves	$C = (R - a_0)/a_1$	C = analytical concentration R = instrument response a_0 = intercept of regression curve (instrument response when concentration is zero) a_1 = slope of regression curve (change in response per change in concentration)
Calibration factors [1]	$C = A_x V_f / CF V_i$	C = concentration (µg/L) CF = calibration factor A_x = peak size of target compound in sample extract V_f = final volume of extracted sample (mL) V_i = initial volume of sample extracted (mL)
Response factors [2]	$C = C_{is} A_x V_f / RF A_{is} V_I$	C = concentration (µg/L) RF = internal standard response factor C_{is} = concentration of the internal standard (µg/L) A_x = area of the characteristic ion for the target compound V_f = final volume of extracted sample (mL) A_{is} = area of the characteristic ion for the internal standard V_i = initial volume of sample extracted (mL)
Residues [3]	R = (W – T)/V x 1,000,000	R^6 = residue concentration (mg/L) W = weight of dried residue + container (g) T = tare weight of container (g) V = volume of sample used (mL)
Solid samples [4]	K = C V D / W (%S/100)	K = dry-weight concentration (milligram per kilogram, mg/kg) C = analytical concentration (mg/L) V = final volume (mL) of processed sample solution D = dilution factor W = wet weight (g) of as-received sample taken for analysis %S = percent solids of as-received sample

1. Used for quantitation by the external standard technique
2. Used for quantitation by the internal standard technique
3. Used for total, filterable, nonfilterable, and volatile residues as well as gravimetric oil and grease
4. Used to calculate the dry-weight concentration of a solid sample from the analytical concentration of the processed sample.
5. Conversion factor to convert g/mL to mg/L:
   $$\frac{mg}{L} = \frac{g}{mL} \times \frac{10^3 mL}{L} \times \frac{10^3 mg}{g}$$

FIGURES

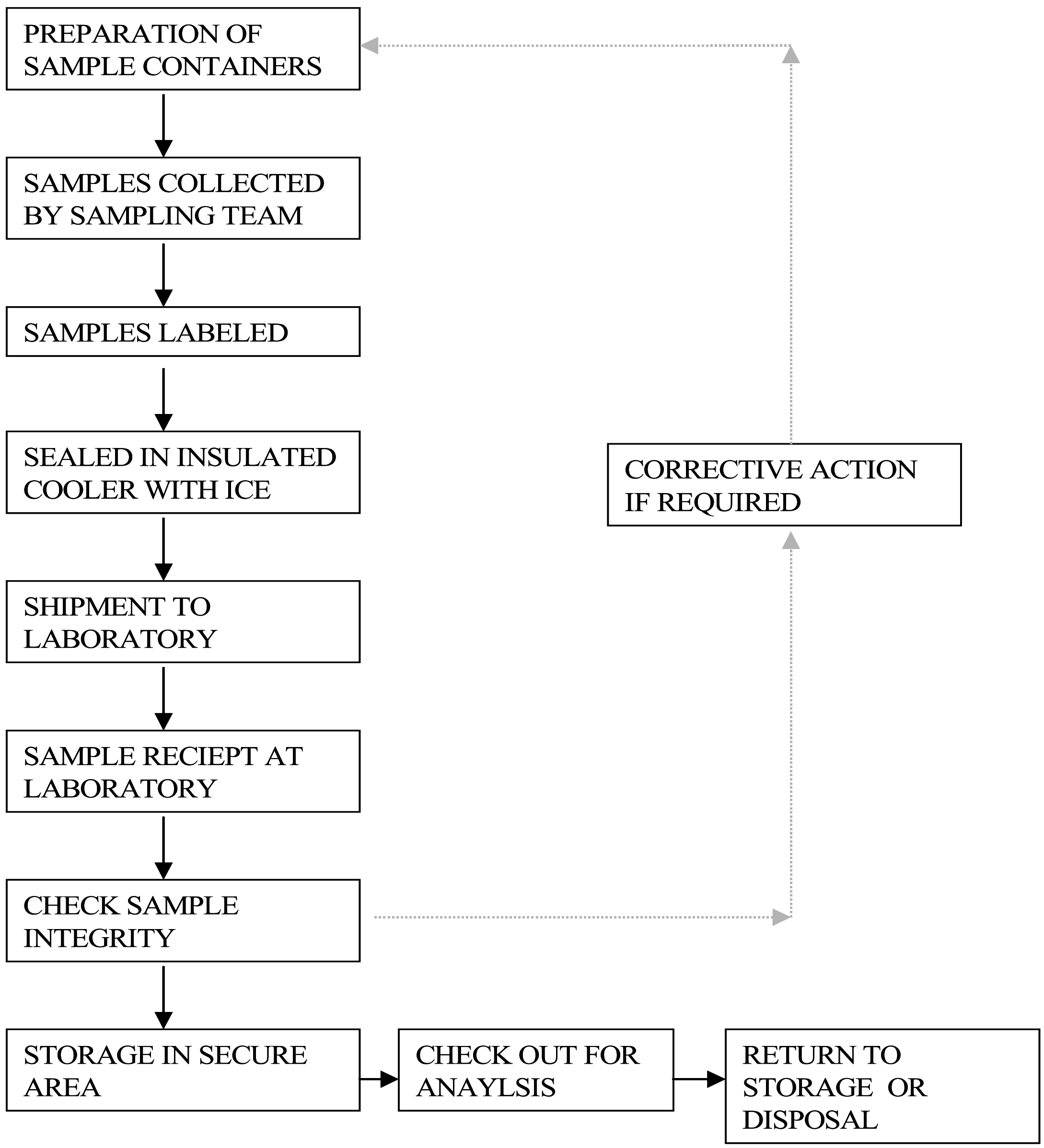

FIGURE 4.1 SAMPLE CUSTODY FLOW CHART

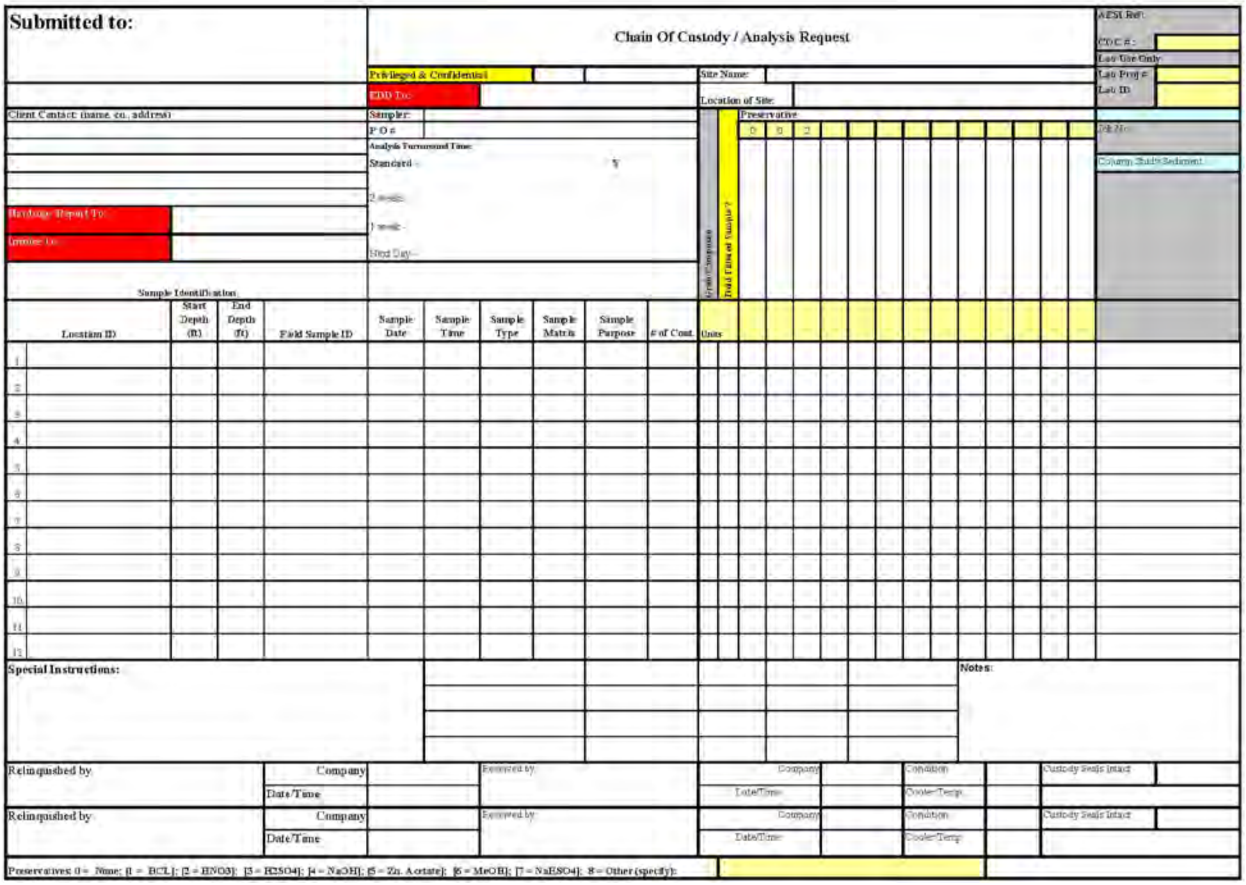

FIGURE 4.2 EXAMPLE CHAIN-OF-CUSTODY

CORRECTIVE ACTION REQUEST

Number ______________________ **Date:____________________**

TO: ______________________

You are hereby requested to take corrective actions indicated below and as otherwise determined by you (a) to resolve the noted conditions and (b) to prevent it from recurring. Your written response is to be returned to the Project quality assurance manager by ________________.

Condition:

Reference Documents:

Originator ________ Date ________ Approval ________ Date ____ Approval ____ Date ________

Response

Cause of Condition:

Corrective Action

(A) Resolution:

(B) Prevention

(B2) Affected Documents

Signature______________________ Date__________

CA Follow-up

Corrective Action verified by:______________________ Date _________

FIGURE 10-1 CORRECTIVE ACTION REQUEST FORM

ATTACHMENT 1 NYSDEC GUIDELINES FOR SAMPLING AND ANALYSIS OF PFAS

NEW YORK STATE OF OPPORTUNITY. | Department of Environmental Conservation

GUIDELINES FOR SAMPLING AND ANALYSIS OF PFAS

Under NYSDEC's Part 375 Remedial Programs

January 2020

Contents

ERRATA SHEET for

Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Program
Issued January 17, 2020

Citation and Page Number	Current Text	Corrected Text	Date

January 2020

Guidelines for Sampling and Analysis of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis and reporting of PFAS, DER has developed this document to summarize procedures and update previous DER technical guidance pertaining to PFAS.

Applicability

Sampling for PFAS has already been initiated at numerous sites under DER-approved work plans, in accordance with specified procedures. All future work plans should include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected. Equipment blanks should be collected at a minimum frequency of one per day or one per twenty samples, whichever is more frequent.

Data Assessment and Application to Site Cleanup

Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10.

Water Sample Results

PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt). In addition, further assessment of water may be warranted if either of the following screening levels are met:

a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or
b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L

If PFAS are identified as a contaminant of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

Soil Sample Results

The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase.

Sites in the site management phase should evaluate for PFAS to determine if modification to any components of the SMP is necessary (e.g., monitoring for PFAS, upgrading treatment facilities, or performing an RSO).

Testing for Imported Soil

Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the *PFAS Analyte List* (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs.

If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State's Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

Analysis and Reporting

As of January 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third party data validator. Electronic data submissions should meet the requirements provided at: https://www.dec.ny.gov/chemical/62440.html.

DER has developed a *PFAS Analyte List* (Appendix F) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

Routine Analysis

Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP) does not offer certification for PFAS in matrices other than finished drinking water. However, laboratories analyzing environmental samples for PFAS (e.g., soil, sediments, and groundwater) under DER's Part 375 remedial programs need to hold ELAP certification for PFOA and PFOS in drinking water by EPA Method 537.1 or ISO 25101. Laboratories should adhere to the guidelines and criteria set forth in the DER's laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids). Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist.

Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay). Commercially methods are also available for biota and air samples.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.

Please note that TOP Assay analysis of highly-contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
  - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP-approved lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an "Analytical Methods/Quality Assurance Summary Table" specifying:
  - Matrix type
  - Number or frequency of samples to be collected per matrix
  - Number of field and trip blanks per matrix
  - Analytical parameters to be measured per matrix
  - Analytical methods to be used per matrix with minimum reporting limits
  - Number and type of matrix spike and matrix spike duplicate samples to be collected
  - Number and type of duplicate samples to be collected
  - Sample preservation to be used per analytical method and sample matrix
  - Sample container volume and type to be used per analytical method and sample matrix
  - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by LC-MS/MS for PFAS using methodologies based on EPA Method 537.1
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
  - Reporting Limits should be less than or equal to:
    - Aqueous – 2 ng/L (ppt)
    - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
- Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537.1, EPA Method 533, or ISO 25101
- Include detailed sampling procedures
  - Precautions to be taken
  - Pump and equipment types
  - Decontamination procedures
  - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment
- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per matrix

Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification. Previous results of "non-detect" for PFAS from the UCMR3 water supply testing program are acceptable as verification.

Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix C - Sampling Protocols for PFAS in Monitoring Wells

General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank every day that sampling is conducted and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix D - Sampling Protocols for PFAS in Surface Water

General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank every day that sampling is conducted and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., wash room sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank every day that sampling is conducted and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the latest guidelines developed by the Division of Fish and Wildlife (DFW) entitled "General Fish Handling Procedures for Contaminant Analysis" (Ver. 8).

Procedure Name: General Fish Handling Procedures for Contaminant Analysis

Number: FW-005

Purpose: This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

Organization: Environmental Monitoring Section
Bureau of Ecosystem Health
Division of Fish and Wildlife (DFW)
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, New York 12233-4756

Version: 8

Previous Version Date: 21 March 2018

Summary of Changes to this Version: Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

Originator or Revised by: Wayne Richter, Jesse Becker

Date: 26 April 2019

Quality Assurance Officer and Approval Date: Jesse Becker, 26 April 2019

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES

A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:

1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).

2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.

3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.

B. The following data are required on each **Fish Collection Record** form:

1. Project and Site Name.

2. DEC Region.

3. All personnel (and affiliation) involved in the collection.

4. Method of collection (gill net, hook and line, etc.)

5. Preservation Method.

C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:

1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.

2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.

3. Date collected.

4. Sample location (waterway and nearest prominent identifiable landmark).

5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.

2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.

3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.

4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate “Age” column.

5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.

6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.

7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.

E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish’s tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **The Bureau of Ecosystem Health will supply the bags.** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with the same information.

F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.

G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.

H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:

    No materials containing Teflon.
    No Post-it notes.
    No ice packs; only water ice or dry ice.
    Any gloves worn must be powder free nitrile.
    No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
    No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
    Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
    Wash hands after handling any food containers or packages as these may contain PFCs. Keep pre-wrapped food containers and wrappers isolated from fish handling.
    Wear clothing washed at least six times since purchase.
    Wear clothing washed without fabric softener.
    Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with "fluor" in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.

I. All fish must be kept at a temperature <45° F (<8° C) immediately following data processing. As soon as possible, freeze at -20° C ± 5° C. Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.

J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.

K. A recommended equipment list is at the end of this document.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

Project and Site Name ______________________________ DEC Region ______

Collections made by (include all crew) ______________________________

Sampling Method: ☐Electrofishing ☐Gill netting ☐Trap netting ☐Trawling ☐Seining ☐Angling ☐Other ______________

Preservation Method: ☐Freezing ☐Other ______________ Notes (SWFDB survey number): ______________

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17, 4/26/19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAIN OF CUSTODY

I, ______________________________, of ____ collected the
(Print Name) (Print Business Address)

following on ____________________, 20____ from ____
(Date) (Water Body)

in the vicinity of ____
(Landmark, Village, Road, etc.)

Town of ____, in _________________________________ County.

Item(s) ____

____

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on ____________________________________, 20______.

____ ____________________________
Signature Date

I, __________________________________, received the above mentioned sample(s) on the date specified and assigned identification number(s) ____ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

_______________________________________ ___________________
Signature Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

richter: revised 21 April 2014; becker: 23 March 2017, 26 April, 2019

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

HANDLING INSTRUCTIONS

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelops, approximately 2” x 3.5”, if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluroroctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) developed the following guidelines for laboratories analyzing environmental samples for PFAS under DER programs. If laboratories cannot adhere to the following guidelines, they should contact DER's Quality Assurance Officer, Dana Maikels, at dana.maikels@dec.ny.gov prior to analysis of samples.

Isotope Dilution

Isotope dilution techniques should be utilized for the analysis of PFAS in all media.

Extraction

For water samples, the entire sample bottle should be extracted, and the sample bottle rinsed with appropriate solvent to remove any residual PFAS.

For samples with high particulates, the samples should be handled in one of the following ways:

1. Spike the entire sample bottle with isotope dilution analytes (IDAs) prior to any sample manipulation. The sample can be passed through the SPE and if it clogs, record the volume that passed through.
2. If the sample contains too much sediment to attempt passing it through the SPE cartridge, the sample should be spiked with isotope dilution analytes, centrifuged and decanted.
3. If higher reporting limits are acceptable for the project, the sample can be diluted by taking a representative aliquot of the sample. If isotope dilution analytes will be diluted out of the sample, they can be added after the dilution. The sample should be homogenized prior to taking an aliquot.

If alternate sample extraction procedures are used, please contact the DER remedial program chemist prior to employing. Any deviations in sample preparation procedures should be clearly noted in the case narrative.

Signal to Noise Ratio

For all target analyte ions used for quantification, signal to noise ratio should be 3:1 or greater.

Blanks

There should be no detections in the method blanks above the reporting limits.

Ion Transitions

The ion transitions listed below should be used for the following PFAS:

PFOA	413 > 369
PFOS	499 > 80
PFHxS	399 > 80
PFBS	299 > 80
6:2 FTS	427 > 407
8:2 FTS	527 > 507
N-EtFOSAA	584 > 419
N-MeFOSAA	570 > 419

Branched and Linear Isomers

Standards containing both branched and linear isomers should be used when standards are commercially available. Currently, quantitative standards are available for PFHxS, PFOS, NMeFOSAA, and NEtFOSAA. As more standards become available, they should be incorporated in to the method. All isomer peaks present in the standard should be integrated and the areas summed. Samples should be integrated in the same manner as the standards.

Since a quantitative standard does not exist for branched isomers of PFOA, the instrument should be calibrated using just the linear isomer and a technical (qualitative) PFOA standard should be used to identify the retention time of the branched PFOA isomers in the sample. The total response of PFOA branched and linear isomers should be integrated in the samples and quantitated using the calibration curve of the linear standard.

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated for each target analyte and the ratio compared to standards. Lab derived criteria should be used to determine if the ratios are acceptable.

Reporting

Detections below the reporting limit should be reported and qualified with a J qualifier.

The acid form of PFAS analytes should be reported. If the salt form of the PFAS was used as a stock standard, the measured mass should be corrected to report the acid form of the analyte.

Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report. Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory's Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER's Quality Assurance Officer, Dana Maikels, at dana.maikels@dec.ny.gov.

Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 14 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6ºC upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

Initial Calibration

The initial calibration should contain a minimum of five standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%. Linear fit calibration curves should have an R^2 value greater than 0.990.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects
R^2 >0.990	J flag detects and UJ non detects
Low-level calibration check <50% or >150%	J flag detects and UJ non detects
Mid-level calibration check <70% or >130%	J flag detects and UJ non detects

Initial Calibration Verification

An initial calibration verification (ICV) standard should be from a second source (if available). The ICV should be at the same concentration as the mid-level standard of the calibration curve.

ICV recovery <70% or >130%	J flag detects and non-detects

Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results

Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample

Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects

Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated from the standards for each target analyte. Lab derived criteria should be used to determine if the ratios are acceptable. If the ratios fall outside of the laboratory criteria, qualify results as an estimated maximum concentration.

Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

Branched and Linear Isomers

Observed branched isomers in the sample that do not have a qualitative or quantitative standard should be noted and the analyte should be qualified as biased low in the final data review summary report. Note: The branched isomer peak should also be present in the secondary ion transition.

Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).

Peak Integrations

Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

ATTACHMENT 2 PFAS SAMPLING CHECKLIST

PARSONS

Site Name: ______________________________
Weather (temp/precip): ____________________

Task: ______________________________
Date: ______________________________

Field Clothing and PPE:

☐ Ansell TNT® Powder-Free Nitrile Gloves ONLY
☐ No clothing or boots containing Gore-Tex™
☐ No clothing or boots treated with water-resistant spray
☐ Safety boots made from polyurethane and PVC or leather boots covered with overboots
☐ No materials containing Tyvek®
☐ Field crew has not used fabric softener on clothing
☐ Field crew has not used cosmetics, moisturizers, hand cream, or other related products this morning
☐ Field crew has not applied unauthorized sunscreen or insect repellant
☐ Samplers don fresh nitrile gloves for each sample collected

Field Equipment:

☐ No Teflon® or LDPE containing materials other than QED brand LDPE
☐ All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene or QED brand LDPE
☐ No waterproof field books, waterproof paper or waterproof bottle labels, waterproof markers/Sharpies®
☐ No plastic clipboards, binders, or spiral hard cover notebooks
☐ No Post-It Notes®
☐ Coolers filled with regular ice only; no chemical (blue) ice packs in possession

Sample Containers:

☐ Containers for PFAS shipped in separate cooler
☐ Sample containers made of HDPE or polypropylene
☐ Caps are unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

☐ Wet weather gear made of polyurethane and PVC only

Equipment Decontamination:

☐ PFAS-free water on-site for decontamination of sample equipment; no other water sources to be used
☐ Alconox® or 7th Generation Free & Clear Dish Soap to be used as decontamination cleaning agents

Food Considerations:

☐ No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade® and Powerade®) that is available for consumption only in the staging area

Vehicle Considerations:

☐ Avoid utilizing areas inside vehicle as sample staging areas

Sampling Equipment and Supply Summary (include brand names and serial numbers where available):

Decontamination fluid source(s): ______________________________

Soap and other fluids used: ______________________________

Gloves: ______________________ Rope: ______________________

Sampling Equipment: ______________________________

Deviation Summary:

If possible, materials identified as potentially containing PFAS should be relocation to a separate area of the site as far away as possible from the sampling location(s) and containerized if practicable. Notes should include method of response including type of materials on site and how they were moved and containerized.

Deviations include: ______________________________

____

____

____

Field Team Leader Name: ____________________

Field Team Leader Signature: ____________________

Field Team Member Name	Field Team Member Signature

ATTACHMENT 3 SUMMARY OF ANALYTICAL DATA PACKAGE (DQO LEVEL IV)

1.0 INTRODUCTION

In order for data to be used for decision-making purposes it is essential that it be of known and documented quality. Verification and validation of data requires that appropriate quality assurance and quality control (QA/QC) procedures be followed, and that adequate documentation be included for all data generated both in the laboratory and in the field.

The QA/QC documentation provided by any laboratory, in conjunction with sample results, allows for evaluation of the following indicators of data quality:

- Integrity and stability of samples;
- Instrument performance during sample analysis;
- Possibility of sample contamination;
- Identification and quantitation of analytes;
- Analytical precision; and
- Analytical accuracy.

General laboratory documentation requirements discussed in this document are formatted into two sections, organic and inorganic analyses. These specifications are intended to establish general, analytical documentation requirements that laboratories should meet when generating data for this project.

2.0 GENERAL DOCUMENTATION REQUIREMENTS

2.1 DATA PACKAGE FORMAT

Each data package for Level IV data submitted will consist of five sections:

- Case narrative;
- Chain-of-custody documentation
- Summary of results for environmental samples;
- Summary of QA/QC results; and
- Raw data.

Level II data packages will not contain the raw data.

Data packages will be consistent with, and will supply the data and documentation required for NYSDEC ASP-defined deliverables (i.e. Category B and Category A). Summaries of data and results may be presented in a Contract Laboratory Program (CLP) type format or an equivalent format that supplies the required information as stated below. All laboratory data qualifiers shall be defined in the deliverable.

In cases where the laboratory has varied from established methodologies, they will be required to provide the Standard Operating Procedures (SOPs) for those methods and added as an attachment to the Work Assignment Scoping Documents or as variances to this QAPP. Inclusion of these SOPs will aid in final review of the data by data reviewers and users.

2.2 CASE NARRATIVE

The case narrative will be written on laboratory letterhead and the release of data will be authorized by the laboratory manager or their designee. The Case Narrative will consist of the following information:

- Client's sample identification and the corresponding laboratory identification;
- Parameters analyzed for each sample and the methodology used. EPA method numbers should be cited when applicable;
- Whether the holding times were met or exceeded;
- Detailed description of all analytical and/or sample receipt problems encountered;
- Discussion of reasons for any QA/QC sample result exceedances; and
- Observations regarding any occurrences which may adversely impact sample integrity or data quality.

2.3 CHAIN-OF-CUSTODY

Legible copies of all COC forms for each sample shall be submitted in the data package. Copies of any internal laboratory tracking documents should also be included. It is anticipated that COC forms and/or internal laboratory tracking documents will include the following information:

- Date and time of sampling and shipping;
- Sampler and shipper names and signatures;
- Type of sample (grab or composite);
- Analyses requested;
- Project, site, and sampling station names;
- Date and time of sample receipt;
- Laboratory sample receiver name and signature;
- Observed sample condition at time of receipt;
- Sample and/or cooler temperatures at time of receipt;
- Air bill numbers;
- Custody seal; and
- Sample numbers.

3.0 ORGANIC ANALYSES DOCUMENTATION REQUIREMENTS

These requirements are applicable to organic methods (e.g., VOCs, SVOCs, PFAS).

3.1 SUMMARY OF ENVIRONMENTAL SAMPLE RESULTS

The following information is to be included in the summary of sample results for each environmental sample.

- Client's sample identifications and corresponding laboratory identifications;
- Sample collection dates;
- Dates and times of sample extraction and/or analysis;
- Weights or volumes of sample used for extraction and/or analysis;

- Identification of instruments used for analysis;
- Gas Chromatography (GC) column and detector specifications;
- Dilution or concentration factor for the sample;
- Percent Difference between columns, if applicable;
- Percent Moisture or Percent Solids for soil samples;
- Method Detection Limits (MDLs) or sample Reporting Limits (RLs);
- Analytical results and associated units;
- Discussion of any manual integrations; and
- Definitions for any laboratory data qualifiers used.

3.2 SUMMARY OF QA/QC SAMPLE RESULTS (AS APPLICABLE)

The following QA/QC sample results shall be presented on QC summary forms. They shall also include the date and time of analysis. Additional summary forms may be required for some methods. Therefore, when reporting data, laboratories should defer to specific method requirements.

All summary forms should, at a minimum, include in the header:

- Form Title;
- Project Identifier (e.g., Batch QC ID, Site Name, Case Number, Sample Delivery Group);
- Laboratory Name; and
- Sample Matrix.

3.2.1 Instrument Calibration (for each instrument used)

- **GC/MS Tuning**. Report mass listings, ion abundance criteria, and percent relative abundances. List the instrument identification (ID) and the date and time of analysis. Ensure that all ion abundances have been appropriately normalized.
- **Initial Calibration**. Report analyte concentrations of initial calibration standards and the date and time of analysis. List the instrument identification (ID), response factors (RF), relative response factors (RRF), or calibration factors (CF), percent relative standard deviation (%RSD), and retention time (RT) for each analyte. The initial calibration (IC) report must also include a sample identifier (ID), associated injection volume or quantity of sample analyzed, the acceptance criteria, such as minimum RF values, and associated maximum %RSD values.
- **Continuing Calibration**. Report the concentration of the calibration standard used for the continuing calibration and for the mid-level standard, and the date and time of analysis. List the ID, RF, RRF, CF, percent difference (%D), and RT for each analyte.
- **Quantitation Limit** or Project Required Reporting Limit (PRRL) Verification (if applicable). Report results for standards that are used to verify instrument sensitivity. Report the source for the verification standards. Report the concentration for the true value, the concentration found, the percent recovery, and control limits for each analyte analyzed. The date and time of analysis must also be reported.

3.2.2 Method Blank Analysis

List environmental samples and QC analyses associated with each method blank. Report concentrations of any analytes found in method blanks above the instrument detection limit.

3.2.3 Surrogate Standard Recovery

Report the name and concentration of each surrogate compound added. List percent recoveries of all surrogates in the samples, method blanks, matrix spike/matrix spike duplicates and other QC analyses. Also include acceptance ranges that the laboratory used for the analysis.

3.2.4 Internal Standard Summary

Report internal standard area counts of the associated calibration standard and retention times, include upper and lower acceptance limits. List internal standard area counts and retention times for all samples, method blanks, matrix spike/matrix spike duplicates and other QC analyses. Include the ID and the date and time of analysis.

3.2.5 Compound Confirmation

Report retention times of each compound on both columns as well as retention time windows of the associated standard. In addition, report determined concentrations from each column and percent differences between results. List the ID and the date and time of analysis. A summary should be generated for each sample, including dilutions and reanalyses, blanks, MSs, and MSDs.

3.2.6 Peak Resolution Summary

For primary and secondary columns report retention times of any target compounds and/or surrogates that coelute in the standards (ie. the Performance Evaluation Mixture for Contract Laboratory Program pesticides). Calculate and report the percent resolution between each pair of compounds which coelute. Include the ID, column ID, and the date and time of analysis.

3.2.7 Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

Report the name and concentration of each spiking compound. Samples are to be spiked with specified compounds of potential concern. List sample results, spiked sample results, duplicate spiked sample results, percent recovery (%R) and the relative percent difference (RPD) between the MS and MSD (if applicable). Acceptance criteria that the laboratory used for the analysis must also be presented.

3.2.8 Laboratory Duplicate Analysis

When performed, report the RPD between duplicate analyses, along with the associated acceptance criteria.

3.2.9 Laboratory QC Check Sample Analysis

Also known as the Laboratory Control Sample (LCS) or Matrix Spike Blank (MSB). Report the name and concentration of each spiking compound. List the QC check sample and duplicate (if applicable) results, %R, and RPD, if performed in duplicate. The acceptance criteria that the laboratory used for the analysis must also be presented.

3.2.10 Other QC Criteria

- **Retention time windows determination.** Report the retention time window for each analyte, for both primary and confirmation analyses.
- **Compound identification.** Report retention times and concentrations of each analyte detected in samples.
- **MDL determination.** List most recent method detection limits, with dates determined maintained in laboratory file. MDL summary forms may be submitted at start of project and not included in individual data packages.
- **Additional method suggested QC parameters, if required.**
- **Any Performance Evaluation (PE) samples** (if identified) associated with the environmental samples.

3.3 RAW DATA

Legible copies of the raw data shall be organized systematically, each page shall be numbered, and a table of contents must be included with each package. Raw data for compound identification and quantitation must be sufficient to verify each result.

3.3.1 Gas Chromatographic (GC) Analyses

This section shall include legible copies of raw data for the following:

- Environmental samples arranged in sequential order by laboratory sample number, include dilutions and reanalyses;
- Instrument calibrations; and
- QC analyses (i.e., method blanks, LCS, etc.).

Raw data for both primary and confirmation analyses are to be included. Raw data for each analysis shall include the following:

- Appropriately scaled chromatograms (label all analyte peaks, internal standards and surrogate standards with chemical names). All chromatograms shall be scaled such that individual peaks can be readily resolved from any neighboring peaks;
- Appropriately scaled before and after manual integrations;
- Area print-outs or quantitation reports;
- Instrument analysis logs for each instrument used;
- Sample extraction and cleanup logs;
- Standards preparation logs and manufacturer certificates of analyses for standards, if applicable, sufficient to document traceability of all standards (including surrogates, internal standards, and spike solutions) maintained in "job file" in laboratory, unless otherwise requested;
- Percent Moisture or Percent Solids for soil samples; and
- GC/MS confirmation, as applicable.

Note: Additional raw data may be required for some methods. Therefore, when reporting data, laboratories should defer to specific method requirements.

3.3.2 Gas Chromatographic / Mass Spectrometric (GC/MS) Analyses

This section shall include legible copies of raw data for the following:

- Environmental samples arranged in sequential order by laboratory sample number, include dilutions and reanalyses;

- Mass spectrometer tuning and mass calibration (BFB, DFTPP);
- Initial and continuing instrument calibrations; and
- QC analyses (i.e., method blanks, LCS, etc.).

Raw data for each analysis shall include the following:

- Appropriately scaled chromatograms (label all analyte peaks, internal standards and surrogate standards with chemical names). All chromatograms shall be scaled such that individual peaks can be readily resolved from any neighboring peaks;
- Appropriately scaled before and after manual integrations;
- Ion scans and enhanced spectra of target analytes and tentatively identified compounds (TICs), with the associated best-match spectra;
- Area print-outs and quantitation reports;
- Instrument analysis logs for each instrument used;
- Sample extraction and cleanup logs;
- Standards preparation logs and manufacturer certificates of analyses for standards, if applicable, sufficient to document traceability of all standards (including surrogates, internal standards, and spike solutions) maintained in "job file" in laboratory, unless otherwise requested; and
- Moisture Content (Percent Moisture) for sediment samples.

Note: Additional raw data may be required for some methods. Therefore, when reporting data, laboratories should defer to specific method requirements.

4.0 INORGANIC ANALYSES DOCUMENTATION REQUIREMENTS

4.1 SUMMARY OF ENVIRONMENTAL SAMPLE RESULTS

The following information is to be included in the summary of sample results for each environmental sample:

- Client's sample identifications and corresponding laboratory identifications;
- Sample collection dates;
- Dates and times of sample digestion and/or analysis;
- Weights or volumes of sample used for digestion and/or analysis;
- Identification of instruments and analytical techniques used for analysis;
- Instrument specifications;
- Dilution or concentration factor for the sample;
- Percent Moisture or Percent Solids for soil samples;
- Detection Limits: MDLs, RLs;
- Analytical results and associated units; and
- Definitions for any laboratory data qualifiers used.

4.2 SUMMARY OF QA/QC RESULTS

The following QA/QC sample results shall be presented on QC summary forms. They shall also include the date and time of analysis. Additional summary forms may be required for some methods. Therefore, when reporting data, laboratories should defer to specific method requirements.

All summary forms shall, at a minimum, include in the header:

- Form Title;
- Project Identifier (e.g., Batch QC ID, Site Name, Case Number, Sample Delivery Group);
- Laboratory Name; and
- Sample Matrix.

4.2.1 Instrument Calibration Verification (if applicable)

The order for reporting of calibration verifications for each analyte must follow the chronological order in which the standards were analyzed.

- **Initial Calibration Verification.** Report the source for the calibration verification standards. Report the concentration for the true value, the concentration found, the percent recovery, and control limits for each element analyzed. The date and time of analysis must also be reported.
- **Continuing Calibration Verification**. Report the source for calibration verification standards. Report the concentration for the true value, the concentration found, the percent recovery, and control limits for each element analyzed. The date and time of analysis must also be reported.
- **Quantitation Limit** or PRRL Verification (if applicable). Report results for standards that are used to verify instrument sensitivity. Report the source for the verification standards. Report the concentration for the true value, the concentration found, the percent recovery, and control limits for each element analyzed. The date and time of analysis must also be reported.

4.2.2 Blank Analysis

Report analyte concentrations above the instrument detection limits found in the initial calibration blanks (ICBs), continuing calibration blanks (CCBs), and in method/ preparation blanks. The date and time of analysis must also be reported. The order for reporting ICB and CCB results for each analyte must follow the chronological order in which the blanks were analyzed.

4.2.3 Matrix Spike (MS) Analysis

Report concentrations of the unspiked sample result, the spiked sample result and the concentration of the spiking solution added to the pre-digestion spike for each analyte. Calculate and report the %R and list control limits. If performed in duplicate, provide the %R for the MSD and the RPD.

4.2.4 Post Digestion Spike Analysis (if applicable)

In addition to matrix spikes, post-digestion spikes are often required by the method. Report concentrations of the unspiked sample results, spiked sample results, and the concentration of the spiking solution added. Calculate and report the %R and list control limits.

4.2.5 Laboratory Duplicate Analysis

Report concentrations of original and duplicate sample results. Calculate and report the RPD and list control limits.

4.2.6 Laboratory Control Sample

Identify the source for the LCS. Report the found concentration of the laboratory control sample and the true concentration for all analytes. Calculate and report the %R and list control limits.

4.2.7 Other QC Criteria (if applicable)

- **Method of Standard Additions (MSA).** This summary must be included if MSA analyses are performed. Report absorbance values with corresponding concentration values. Report the final analyte concentration and list the associated correlation coefficient and control limits.
- **ICP-AES Serial Dilution.** Report initial and serial dilution results, associated %D, and control limits.
- **ICP-AES Linear Dynamic Ranges.** For each instrument and wavelength used, report the date on which linear ranges were established, the integration time, and the upper limit concentration.
- **MDL Determination.** List most recent method detection limits as determined using the September 2017 promulgation of the 40CFR136, with dates determined maintained in laboratory file. MDL summary forms may be submitted at start of project and not included in individual data packages.
- **Any Performance Evaluation (PE) Samples** (if identified) associated with the environmental samples.

4.3 RAW DATA

Legible copies of the raw data shall be organized systematically, each page shall be numbered, and a table of contents must be included with each package. Data should be organized sequentially by method and analysis date. Raw data for compound identification and quantitation must be sufficient to verify each result.

4.3.1 Atomic Absorption (AA) and Atomic Emission (AE) Spectrometric Analyses

This section shall include legible copies of raw data for the following:

- Environmental sample results, include dilutions and reanalyses;
- Instrument calibrations; and
- QC analyses (i.e., method blanks, LCS, etc.).
- Measurement print-outs for all instruments used or copies of logbook pages for analyses that do not provide instrument print-outs;
- Absorbance units, emission intensities, or other measurements for all analyses;
- Sample preparation and digestion logs that include reagents used, standards referenced to standards preparation logs, volumes of reagents, digestion times, etc.;
- Instrument analysis logs for each instrument used or summary of sample analyses;
- Standards preparation logs and manufacturer certificates of analyses for standards, if applicable, sufficient to document traceability of all standards (including spike solutions) maintained in “job file” in laboratory, unless otherwise requested;
- Wavelengths used for the analyses; and
- Percent Moisture or Percent Solids for soil samples.

Note: Additional raw data may be required for some methods. Therefore, when reporting data, laboratories should defer to specific method requirements.

4.3.2 Titrimetric and Colorimetric Analyses

This section shall include legible copies of raw data for the following:

- Environmental sample results, include dilutions and reanalyses;
- Calibrations; and
- QC analyses (i.e., method blanks, LCS, etc.).

Raw data for each analysis shall include the following:

- Copies of logbook pages for analyses that do not provide instrument print-outs and calculations used to derive reported sample concentrations;
- Titrant volumes, titration end-points, absorbance units, or other measurements for all analyses;
- Sample preparation and digestion logs that include reagents used, standards referenced to standards preparation logs, volumes of reagents, digestion times, sample volumes, solution normalities, etc.;
- Standards preparation logs and manufacturer certificates of analyses for standards, if applicable, sufficient to document traceability of all standards (including spike solutions) maintained in "job file" in laboratory, unless otherwise requested; and
- Wavelengths used for the analyses.
- Note: Additional raw data may be required for some methods. Therefore, when reporting data, laboratories should defer to specific method requirements.

4.3.3 Gravimetric Analyses

This section shall include legible copies of raw data for the following:

- Environmental sample results, include dilutions and reanalyses;
- Calibrations; and
- QC analyses (i.e., method blanks, LCS, etc.).

Raw data for each analysis shall include the following:

- Copies of logbook pages for analyses that do not provide instrument print-outs and calculations used to derive reported sample concentrations;
- Weights, sample volumes, or other measurements for all analyses;
- Sample preparation and digestion logs that include reagents used, standards referenced to standards preparation logs, volumes of reagents, drying times, drying temperatures, etc.; and
- Standards preparation logs and manufacturer certificates of analyses for standards, if applicable, sufficient to document traceability of all standards maintained in "job file" in laboratory, unless otherwise requested.

Note: Additional raw data may be required for some methods. Therefore, when reporting data, laboratories should defer to specific method requirements.

SUMMARY OF REQUIRED LABORATORY DELIVERABLES FOR LEVEL IV DQO DATA PACKAGE (REQUIREMENTS WILL VARY BY METHOD)

Method Requirements	Laboratory Deliverables
Requirements for all methods:	
Parsons project identification number	Case narrative
Discussion of unusual circumstances or problems	Case narrative
Analytical method description and reference citation	Case narrative
Field sample identification	Signed chain-of-custody forms and sample results form
Laboratory assigned sample number	Signed chain-of-custody forms and sample results form
Sample matrix description	Signed chain-of-custody forms and sample results form
Date of sample collection	Signed chain-of-custody forms and sample results form
Date of sample receipt at laboratory	Signed chain-of-custody forms
Analytical method description and reference citation	Signed chain-of-custody forms and case narrative
Sample analysis results	USEPA Contract Laboratory Program (CLP) form or equivalent sample analysis results summary form (e.g., ASP Form I-VOA)
Dates of sample preparation and analysis (including first run and any subsequent runs)	Specific deliverable depends on type of analysis
Laboratory analytical QC batch info and sample analysis associations	Specific deliverable depends on type of analysis
Instrument analysis sequence log	Specific deliverable depends on type of analysis
Analytical holding times compliance	USEPA CLP form or equivalent holding time summary form
Method detection limit (MDL) determination	USEPA CLP form or equivalent MDL summary form
Method reporting limits (RLs) achieved	Specific deliverable depends on type of analysis (see below)
Dilution or concentration factors	Specific deliverable depends on type of analysis
Discussion of unusual circumstances or problems	Case narrative
Laboratory Control Sample (LCS) results	USEPA CLP form or equivalent LCS results summary form
“Raw” analytical data sufficient to recreate and check analysis results for all calibrations, QC sample results, and sample results	Sequentially numbered pages with tabulated index

REQUIRED LABORATORY DELIVERABLES (Continued)

Method Requirements	Laboratory Deliverables
Matrix spike / matrix spike duplicate	USEPA CLP form or equivalent MS/MSD summary form (e.g., NYSDEC ASP Form III-SV
Method blank analysis	USEPA CLP form or equivalent method blank summary form (e.g., NYSDEC ASP Form IV-SV)
GC/MS instrument performance check. Tuning and mass calibration (abundance) using 4-bromofluorobenzene (BFB) for method SW8260C and decafluoro-triphenyphosphene (DFTPP) for method SW8270CD	USEPA CLP form or equivalent instrument tuning/performance check summary form
Internal Standard Area Counts and Retention Time, as applicable	USEPA CLP form or equivalent internal standard summary form (e.g., NYSDEC ASP Form VIII-SV)
GC/MS initial calibration data	USEPA CLP form or equivalent initial calibration summary form (e.g., NYSDEC ASP Form VI-SV)
GC/MS continuing calibration data.	USEPA CLP form or equivalent continuing calibration summary form (e.g., NYSDEC ASP Form VII-SV)
GC/MS calibration verification (initial and continuing)/2nd source calibration verification (ICV/CCV)	USEPA CLP form or equivalent calibration verification summary form
GC continuing calibration data for volatile and semivolatile analyses. If calibration factors are used, calibration factors and their percent differences from the initial calibration must be reported. Retention time windows and analyte retention times must be included in this form	USEPA CLP form or equivalent calibration verification summary form
GC/MS internal standard area and retention time summary data	USEPA CLP form or equivalent internal standard summary form
GC second column confirmation, as applicable. To be done for all compounds that are detected above method detection limits	Chromatograms of all confirmations of all samples and the standard laboratory form for all positive results
Surrogate Compound percent recovery summary	USEPA form or equipment percent recovery summary form (e.g., NYSDEC ASP Form II-SV)
"Raw" analytical data sufficient to recreate and check analysis results for all calibrations, QC sample results, and sample results	Sequentially numbered pages with tabulated index
Requirements for inorganic analytical methods:	
Initial and Continuing Calibration Verification	USEPA CLP form or equivalent calibration verification summary form(s) (e.g., NYSDEC ASP Form II-IN)

REQUIRED LABORATORY DELIVERABLES (Continued)

Method Requirements	Laboratory Deliverables
ICP Interference Check Sample (ICS), as applicable	USEPA CLP form or equivalent ICS standard summary form (e.g., NYSDEC ASP Form IV-IN)
ICP Interelement Correction Factors, as applicable	USEPA CLP form or equivalent internal standard summary form (e.g., NYSDEC ASP Form XII-IN
Instrument Detection Limit (IDL) or MDL determination	USEPA CLP form or equivalent IDL or MDL summary form(s)
Post-digestion spike, as applicable	USEPA CLP form or equivalent post-digestion spike summary form(s) (e.g., NYSDEC ASP Form V-IN)
ICP linear range	USEPA CLP form or equivalent linear range summary form(s) (e.g., NYSDEC ASP Form XII-IN)
ICP serial dilution, as applicable	USEPA CLP form or equivalent serial dilution summary form(s) (e.g., NYSDEC ASP Form IX-IN)
Method of standard addition (MSA), as applicable	USEPA CLP form or equivalent MSA summary form(s)
Laboratory duplicate results, as applicable	USEPA CLP form or equivalent duplicate analysis summary form(s) (e.g., NYSDEC ASP Form VI-IN)
Requirements for other methods:	
Preparation and analysis logs	No format
Sample results	No format
MS/MSD results	No format
Lab duplicate sample results	No format
Laboratory control sample	Control limits
Method blank results	No format
Initial calibration results	No format
Continuing calibration check (calibration verification)	No format. Report percent relative standard deviation or percent difference from initial calibration

APPENDIX D FIELD ACTIVITIES PLAN

FIELD ACTIVITIES PLAN

Prepared For:

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LIST OF ACRONYMS

Acronym	Definition
ASTM	American Society for Testing and Materials
COC	chain of custody
DNAPL	dense non-aqueous phase liquid
ELAP	Environmental Laboratory Approval Program
EC	emerging contaminant
FAP	Field Activity Plan
GPS	global positioning system
HDPE	high-density polyethylene
IAQ	indoor air quality
ID	inside diameter
LDPE	low-density polyethylene
LNAPL	light non-aqueous phase liquid
MS/MSDS	matrix spike / matrix spike duplicate
NAPL	non-aqueous phase liquid
NTU	nephelometric turbidity unit
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
HASP	Health and Safety Plan
ORP	oxidation-reduction potential
PET	polyethylene terephthalate
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	perflourooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PID	photoionization detector
PPE	personal protective equipment
PSHEP	Parsons Safety, Health, and Environment Plan
PVC	polyvinyl chloride
redox	oxidation-reduction potential
QAPP	Quality Assurance Project Plan
USCS	Unified Soil Classification System
USEPA	United State Environmental Protection Agency
VOC	volatile organic compound
WA	Work Assignment

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

Parsons has developed this generic Field Activities Plan (FAP) to be used during implementation of field activities associated with Work Assignments (WA) issued by the New York State Department of Environmental Conservation (NYSDEC) under Superfund Standby Contract No. D009811.

The objective of this generic FAP is to outline methods and procedures that will allow consistency in investigatory field activities across a potentially broad range of specific project goals and objectives.

The methods and procedures described in this FAP have been prepared in accordance with the most recent and applicable NYSDEC and New York State Department of Health (NYSDOH) regulatory guidance and requirements. In particular, this FAP reflects recent field procedures for sampling of emerging contaminants (ECs) such as Per- and Polyfluoroalkyl Substances (PFAS) and 1,4-dioxane, including the *NYSDEC's Guidance for Sampling and Analysis of PFAS* (NYSDEC, 2020). As such, **Section 2.0** includes a general overview of special considerations that apply to field procedures for sites undergoing investigation of ECs. Additional considerations for sites where EC's are being investigated are discussed within each of the individual field activities discussed in **Section 3.0**, where applicable.

It is our understanding that individual site-specific Work Plans will not be developed for each Work Assignment. Health and safety considerations and emergency procedures associated with this project is documented in the site-specific Parsons Safety, Health, and Environment Plan (PSHEP) and the individual site dashboard cards.

2.0 SPECIAL CONSIDERATIONS FOR PFAS AND 1,4-DIOXANE SAMPLING

This section includes a general overview of considerations which apply to many of the different field activities outlined in **Section 3.0** where investigation of sampling of ECs (including PFAS and 1,4-dioxane) are applicable. Refer to **Section 3.0** for more specific EC sampling details which might apply to each activity (EC-specific protocol are shown in red text). Please be aware that these additional procedures are not applicable if PFAS or 1,4-dioxane sampling are not anticipated at a particular project site.

PFAS, can be found in many standard environmental sampling materials, including: Fluoropolymer or low-density polyethylene (LDPE) bailers/tubing, some decontamination solutions, certain field equipment, such as waterproofing in certain transducers, water level meters, and pumps/valves, as well as coated Tyvek® suits, field notebooks, sharpies, and aluminum foil. Two of the principal target analytes, perflourooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), have been broadly utilized in the production of various everyday items such as: waterproof/stain-resistant clothing, non-stick cookware, many commonly used plastics, and cosmetics. As such, alternative materials (such as high-density polyethylene (HDPE) bailers/tubing) will be used to ensure that cross-contamination, or the introduction of externally-sourced PFAS does not occur. Environmental samples being analyzed for PFAS will be secured in HDPE or polypropylene sample-ware.

1,4-dioxane has been used in many products including the manufacturing of pharmaceuticals, personal care products, polyethylene terephthalate (PET) plastic, paint strippers, dyes, greases, varnishes and waxes. 1,4-dioxane is commonly found in many cleaning products and can be introduced to sample matrices during decontamination of sampling equipment. Only Alconox® or 7th Generation Free & Clear dish soap should be used during decontamination of equipment.

The field activities and methods **Section 3.0** have been appropriately modified (in red text) to prevent cross-contamination of and to avoid the introduction of external contaminant sources when sampling and analyzing for PFAS and 1,4-dioxane. In addition, the following protocol will be utilized during field activities which involve sampling for PFAS and 1,4-dioxane on the day of the event or in the near future:

- **Table 1** includes a summary of prohibited and acceptable items for PFAS and 1,4-dioxane sampling.
- **Appendix A** includes a PFAS and 1,4-dioxane sampling checklist, to be completed daily on the day of each sampling event in order to document field equipment, personal protective equipment (PPE), sampling materials, decontamination, and other procedures used on the day of sampling were conducive to sampling of PFAS and 1,4-dioxane.
- In the event that it is uncertain if any field equipment or supplies may contain PFAS or 1,4-dioxane, such materials should be tested for these compounds in advance of a sampling event by collecting an equipment (rinsate) blank sample and reviewing the analytical results to determine if they will introduce any cross contamination.

<u>Special Precautions for PFAS and 1,4-Dioxane Sampling</u>

Refer to **TABLE 1** for special clothing, PPE, supply and equipment requirements for PFAS and 1,4-dioxane sampling.

Bottles for PFAS samples should be stored and shipped to and from laboratory in separate coolers from other bottleware/samples.

DO NOT mix bottleware for PFAS samples with other bottleware to make bottle sets for sample locations.

Change nitrile gloves prior to handling bottles for PFAS analysis and collection of samples for PFAS analysis.

A 1,4-dioxane and PFAS sampling checklist is included as **Appendix A** and should be filled out daily by field personnel.

3.0 ANTICIPATED FIELD ACTIVITIES

Various field activities may be conducted during execution of Work Assignments. These will invariably include the sampling and monitoring of environmental media including soil, groundwater, and air for the purpose of evaluating the quality of the environmental media and potential impacts to human health and/or the environment. Environmental sample data will also be used to evaluate whether remedial activities are necessary. The potentially applicable field activities that may be conducted during execution of Work Assignments, as well as the methods and procedures for each are described in detail in the following sections.

Where PFAS and/or 1,4-dioxane are a contaminant of concern, best practice techniques, procedures, and NYSDEC guidance shall be utilized to prevent the introduction of non-site-derived PFAS and 1,4-dioxane into target samples. Some of these procedures are discussed in **Section 2.0**. Additional procedures have been incorporated into the sections herein and are colored in red text. **Table 1** includes a summary of prohibited and acceptable PFAS and 1,4-dioxane items. A 1,4-dioxane and PFAS sampling checklist is included as **Appendix A** and should be filled out daily by field personnel.

3.1 SOIL BORINGS

Soil borings will be advanced to facilitate the collection of subsurface soil samples and the installation of monitoring wells. Subsurface soil samples will be used to develop an understanding of site-specific geologic conditions, and to document those conditions. Subsurface soil samples will also be submitted for laboratory analysis to evaluate soil quality and potential remedial activities, if necessary.

Depending on site-specific objectives and/or drilling conditions, soil borings may be advanced using direct-push or conventional hollow stem auger drilling methods.

3.1.1 Direct-Push Method

This drilling method is typically used to collect shallow overburden soils and create boreholes for temporary monitoring well installations or soil vapor sampling points. This method is advantageous in that it typically allows for the advancement of numerous borings in a relatively short period of time. The disadvantage of this method is that it is typically limited to shallow overburden soils (less than 50 feet below grade) which exhibit relatively low densities. When used, the following procedures will be followed by field personnel:

- Soil samples will be collected continuously from the ground surface to the bottom of the borings using 4-foot long, MacroCore™ samplers. Where PFAS sampling is anticipated, PFAS free acetate liners should be used.
- Soil samples retrieved from the borehole will be described for: 1) percent recovery; 2) soil type; 3) color; 4) moisture content; 5) texture; 6) grain size and shape; 7) consistency; 8) evidence of staining or other chemically-related impacts; and 9) any other relevant observations. In addition, soil will be screened with a photoionization detector (PID) to allow evaluation of the bulk volatile organic concentration of each soil sample. Should compound-specific monitoring be required to meet project objectives or by the Health and Safety Plan (HASP), then this monitoring will be conducted using appropriate monitoring devices/meter (*i.e.* Drager® tubes, mercury vapor analyzer, 4-gas meter, etc.).

- Soils will be described in accordance with the Unified Soil Classification System (USCS). This descriptive information will be recorded on a soil boring log form. An example of the typical soil boring log form is provided in **Appendix B**.
- Samples for headspace screening will be collected. A representative portion of each soil sample will be placed in a re-sealable plastic (e.g., Ziploc®) bag filled approximately half full. The bag will be labeled with the boring number and interval sampled. After allowing the bagged soil to warm, the tip of the sample probe attached to the PID will be inserted into the bag to measure the headspace for organic vapors.
- Samples for laboratory analysis will be collected directly from the liner and submitted to an approved NYSDOH Laboratories Approval Program (ELAP)-certified laboratory. Analyses will be conducted using U.S. Environmental Protection Agency (USEPA) methodologies as specified in the Work Assignment Scoping Documents. Samples will be managed in accordance with the Quality Assurance Project Plan (QAPP). Specific soil sample intervals to be submitted for laboratory analysis will be identified in the Work Assignment Scoping Documents and in consultation with NYSDEC. Refer to **Section 3.7** for more specific procedures on soil sampling.
- Soils extracted during the advancement of the direct-push borings will be used to backfill the boring, provided that the boring is not to be used for installation of temporary monitoring well, and in consultation with NYSDEC. However, soils that exhibit "gross" contamination, as evidenced by staining or free-phase product, or any visual, olfactory, or high PID readings , will be managed in accordance with **Section 3.13**. In this event, bentonite chips or pellets will be used to backfill the boring(s).
- Drilling equipment will be decontaminated between each boring in accordance with methods specified in **Section 3.12**. For PFAS sampling, only decon solutions identified on **Table 1** (e.g., Alconox® or 7th Generation Free & Clear Dish Soap) may be used, and decontamination water used must be demonstrated to be free of PFAS constituents.
- Decontamination water will be handled in accordance with **Section 3.13**.
- The boring will be located using a hand-held global positioning system (GPS) device that is capable of providing coordinates with sub-meter accuracy.

3.1.2 Conventional Drill Rig Methods

Typical drilling methods used to collect shallow and deeper overburden soils and create boreholes for permanent monitoring well installations include:

- Hollow stem augers;
- Drive and wash or spin and wash flush joint casing;
- Fluid rotary methods (using potable water only);
- Roto-sonic; and
- Air rotary.

These drilling methods typically allow for the advancement of borings through most soil types including denser soils (e.g., glacial till), and when coupled with split spoon sampling conducted in accordance with American Society for Testing and Materials (ASTM) Method D1586, can provide geotechnical information. Soil samples will be collected continuously from the ground surface to the bottom of the borings. When hollow stem auger drilling is used, samples will be collected using 2-inch diameter split-barrel samplers in accordance with ASTM Method D1586.

- Soil samples retrieved from the borehole will be described for: 1) percent recovery; 2) soil type; 3) color; 4) moisture content; 5) density; 6) texture; 7) grain size and shape; 8) consistency; 9) evidence of staining or other chemically-related impacts; and 10) any other relevant observations. In addition, soil will be screened with a PID to allow evaluation of the bulk volatile organic concentration of each soil sample. Soils will be described in accordance with the USCS. This descriptive information will be recorded on a soil boring log form. An example of the typical soil boring log form is provided in **Appendix B**.

- Headspace screening samples will be collected. A representative portion of each soil sample will be placed in a re-sealable plastic (e.g., Ziploc®) bag filled approximately half full. The bag will be labeled with the boring number and interval sampled. After allowing the bagged soil to warm, the tip of the sample probe attached to the PID will be inserted into the bag to measure the headspace for organic vapors. No analytical samples will be submitted from the bag contents.
- Samples for laboratory analysis will be submitted to an approved NYSDOH Laboratories Approval Program (ELAP)-certified laboratory. Analyses will be conducted using USEPA methodologies as specified in the Work Assignment Scoping Documents. Samples will be managed in accordance with the QAPP. Specific soil sample intervals to be submitted for laboratory analysis will be identified in the Work Assignment Scoping Documents and in consultation with NYSDEC. Refer to **Section 3.7** for more specific procedures on soil sampling.
- Soils extracted during the advancement of the borings will be used to backfill the boring, provided that the boring is not to be used for installation of a permanent monitoring well and in consultation with NYSDEC. However, soils that exhibit "gross" contamination, as evidenced by staining or free-phase product, or any visual, olfactory, or high PID readings, will be managed in accordance with **Section 3.13**. In this event, a cement/bentonite grout will be used to backfill the boring. The grout will be tremied through the auger string as the auger sting is removed.
- Drilling equipment will be decontaminated between each boring in accordance with methods specified in **Section 3.12**. For PFAS sampling, only decon solutions identified on **Table 1** (e.g., Alconox® or 7th Generation Free & Clear Dish Soap) may be used, and decontamination water used must be demonstrated to be free of PFAS constituents.
- Decontamination water will be handled in accordance with **Section 3.13**.
- The boring will be located using a hand-held GPS device that is capable of providing coordinates with sub-meter accuracy.

3.2 MONITORING WELL INSTALLATION AND CONSTRUCTION

Monitoring wells will be used to evaluate the hydrogeologic conditions and groundwater quality. Monitoring wells will be installed to allow characterization of groundwater levels, groundwater flow systems, and groundwater quality. The specific groundwater monitoring objectives will be defined in the Work Assignment Scoping Documents.

Where wells are installed to facilitate PFAS sampling, traditional best practice techniques and procedures shall be subject to modification to prevent the introduction of non-site-derived contaminants including PFAS and 1,4-dioxane into target samples as discussed in **Section 2**. **Table 1** includes a summary of prohibited and acceptable PFAS and 1,4-dioxane items. A 1,4-dioxane and PFAS sampling checklist is included as **Appendix A** and should be filled out daily by field personnel.

3.2.1 Types of Monitoring Wells

Monitoring wells may be installed in overburden or bedrock and may be temporary or permanent depending on the project objectives defined in the Work Assignment Scoping Documents. For wells install at landfills and other waste management facilities, additional well construction regulations apply in accordance with 6 NYCRR, Chapter IV, Subchapter B, Part 360.

3.2.1.1 Temporary Overburden Monitoring Well Installation and Construction

Temporary monitoring wells are typically installed in shallow overburden using direct-push drilling methods and may be used when short-term, cursory groundwater data is to be collected.

Temporary wells will be constructed using 1-inch inside diameter (I.D.), Schedule 40 polyvinyl chloride (PVC), 0.010-inch slotted screen, flush-threaded to 1-inch I.D. Schedule 40 PVC riser casing. All PVC well material shall be procured for dedicated use at a specific site. There shall be no re-use of PVC well material. The screened interval will be selected based on site-specific project objectives defined in the Work Assignment Scoping Documents. A filter pack will be installed within the annular space between the well screen and borehole, as the direct-push rod assembly is retracted. A bentonite seal will be installed on top of the filter pack to the ground surface.

If dense non-aqueous phase liquid (DNAPL) is encountered in the well bore, a permanent monitoring well will be installed and constructed as described in the following section.

3.2.1.2 Permanent Overburden Monitoring Well Installation and Construction

Permanent monitoring wells will be used when long-term monitoring data or hydraulic conductivity testing is required. The monitoring well borings will be advanced using 4.25-inch inner diameter (ID) hollow-stem augers if 2-inch wells are to be installed or 6.25-inch ID hollow stem augers if 4-inch wells are to be installed. During auger advancement, soil samples will be collected at continuous 2-ft intervals using 2-inch diameter split barrel samplers in accordance with ASTM Method D1586.

Permanent monitoring wells will be constructed with 2-inch ID or 4-inch ID, threaded, flush-joint, PVC casings and screens. The well screen, plug, and riser should be certified clean from the manufacturer. If they are not, they will be cleaned using a high-pressure steam cleaner. If DNAPL is encountered in the well bore, then fiberglass reinforced epoxy (FRE) well materials will be used in-lieu of PVC. For wells installed which will be sampled for PFAS, water used for cleaning should be demonstrated to be PFAS-free, and no Teflon® tape, solvents, or glues will be used to connect well sections.

In general, well screens will be 5-feet long for shallow water table wells and 10-feet long for deeper overburden wells, unless greater lengths are required to meet project objectives. The screen slot size will be determined based on visual evaluation of grain-size of soil samples, unless project objectives require quantitative grain-size distribution by sieve analysis. In general, it is anticipated that a slot size of 0.010-inch will be used.

The annulus around the screens will be backfilled with clean silica sand having appropriate size in comparison to the screen slot size. The volume of filter pack required to fill the annular space will be calculated and compared to the volume installed. This information will be recorded on the boring log . The filter pack will be installed in increments as the augers are withdrawn to enable monitoring of progress and to prevent bridging. If bridging occurs, break the bridge before proceeding with installation. The filter pack should extend a minimum of 2 ft (or 20%), whichever is greater) above the top of the screen. A finer grained “choke” sand (100% passing a No. 30 sieve and less than 2% passing the No. 200 sieve) may also be installed between the sand pack and the bentonite seal described below.

A bentonite chip or pellet seal with a minimum thickness of 2 feet will be placed above the filter pack. If the seal is installed above the water table, it will be manually hydrated using potable water. The remainder of the annular space will be filled with cement-bentonite grout to ground surface. The grout will be allowed to set for a minimum of 24 hours before wells are developed.

Well heads may be completed either above grade, or flush with grade. For above grade completions, the well heads will extend approximately 3-ft above grade and will be fitted with a protective casing with a lockable lid. An approximate 2-ft diameter concrete well pad will be installed around the protective casing. The well pad will be sloped away from the protective casing to shed surface water away from the well head. The well identification will be clearly visible on the inside and outside of the lid of the protective casing. The annulus of the protective casing will be filled with gravel and a locking well cap installed at the top of the protective casing. For wells installed on landfills in accordance with 6 NYCRR Part 360, a drain hole will be installed at the base of the protective casing and vent hole will also be located at the top of the protective casing.

Well heads in parking lots, roadways, or other areas accessed by vehicular traffic will be completed flush with grade. Flush-mount curb boxes will be fitted over the well head and will be flush to the surrounding grade. The curb box will be set in an approximate 2-ft diameter concrete pad. A locking J-plug will be installed on top of the well.

The top of the well casing and ground surface will be marked and surveyed to 0.01 foot, and the elevation will be determined relative to a fixed benchmark or datum. The measuring point on all wells will be on the innermost PVC casing.

Soil cuttings generated during the advancement of the monitoring well borings will be containerized for characterization and disposal in accordance with Section 3.13, unless otherwise approved by NYSDEC.

A Well Completion Log will be completed for each well installed. An example of the Well Completion Log is provided in Appendix C.

3.2.1.3 Permanent Bedrock Monitoring Well Installation and Construction

Bedrock monitoring wells will be installed using a combination of hollow stem auger and rock coring, air rotary, or fluid rotary drilling methods, or via roto-sonic drilling. Initially, borings will be advanced through the overburden material using 6-1/4 ID hollow-stem augers or similar equipment dictated by site conditions (except when roto-sonic drilling is used). Soil samples will be collected using 2-inch diameter split-barrel samplers in accordance with ASTM Method D1586.

Once bedrock is encountered, a 6- inch “rock socket” will be installed into the competent rock. If rock cores are to be collected, the bedrock will be cored using NX or HQ core barrels. Information to be recorded during the collection of core samples are indicated on the Core Log provided in Appendix D.

Open bedrock monitoring wells may be used if they meet the objectives specified in the Work Assignment Scoping Documents and if the rock is sufficient competent to allow an intact open borehole. Bedrock monitoring wells may also be constructed with a 5 to 10 foot section of appropriate slot size PVC (or other suitable well screen material) well screen and schedule 40 PVC flush-joint casing (or other suitable riser casing material) to ground surface. The length and slot size of the well screen will be determined by site-specific geologic conditions and the zones from which samples will be taken. Once well screen is installed, well materials will be installed and the well will be completed using the same procedures for overburden monitoring wells as outlined in Section 3.2.1.2.

Well heads in parking lots, roadways, or other areas accessed by vehicular traffic will be completed flush with grade. Flush-mount curb boxes will be fitted over the well head and will be flush to the surrounding grade. The curb box will be set in an approximate 2-ft diameter concrete pad. A locking J-plug will be installed on top of the PVC well.

Rock cuttings generated during the advancement of the bedrock monitoring well borings will be containerized for characterization and disposal in accordance with Section 3.13.

3.3 MONITORING WELL DEVELOPMENT

Subsequent to installation, monitoring wells will be developed to remove the fine material which may have settled within the filter pack and monitoring wells, to remove introduced drilling fluids (if used during installation), and to improve/restore the hydraulic communication with the surrounding formation.

Where wells are installed to facilitate PFAS sampling, traditional best practice techniques and procedures during well development shall be subject to modification to prevent the introduction of non-site-derived contaminants including PFAS and 1,4-dioxane into target samples as discussed in **Section 2.0**. **Table 1** includes a summary of prohibited and acceptable PFAS and 1,4-dioxane items. A 1,4-dioxane and PFAS sampling checklist is included as **Appendix A** and should be filled out daily by field personnel.

- Monitoring well development will be performed or overseen by a field geologist.
- Development will be performed by surging and purging the well, as appropriate, using either a bailer or pump. For wells which are to be sampled for PFAS, wells should be developed using either a stainless steel or PVC bailer, a Watera® pump with HDPE tubing and HDPE surge block, or other equivalent PFAS-free materials.
- Groundwater parameters will be recorded before, during, and after well development. Parameters will include turbidity, pH, temperature, and specific conductance.
- Water levels will be measured in each well to the nearest 0.01 foot prior to development.
- Monitoring wells will be developed until the water discharge from the well is 50 nephelometric turbidity units (NTU) or less, or until pH, temperature, and specific conductivity stabilize, or until a maximum of 10 borehole volumes of the water have been removed. If the well goes dry during development, it will be allowed to recharge to 80% of initial water level and pumped or bailed again. The well will be considered developed after pumping the well dry three times.
- Well development information will be recorded on a Well Development Log. An example of the Well Development Log is provided in **Appendix E**.
- Ideally, dedicated and/or disposable equipment will be used for well development. However, if non-dedicated well development equipment is used, it will be decontaminated after use in accordance with **Section 3.12**.
- Development water will be containerized for characterization and disposal in accordance with **Section 3.13**. If approval by NYSDEC is otherwise obtained to allow discharge directly to the ground surface, the water should be directed away from surface water bodies and allowed to infiltrate back into the ground unless other techniques are stipulated on a site-specific basis.
- Following development, the monitoring wells will be allowed to equilibrate for a minimum of 24 hours prior to groundwater sampling.

3.4 MONITORING WELL ABANDONMENT

There may be occasions when monitoring wells will require abandonment. For temporary monitoring wells, the approach will be to pull the PVC well materials from the borehole, and backfill the remaining open portion of the borehole with cement/bentonite grout to approximately 0.5 feet below the ground surface. The ground surface will be restored to a similar condition as the surrounding grade (i.e. topsoil, asphalt, etc.). For permanent overburden and bedrock monitoring wells, depending on the site-specific subsurface geologic conditions and nature of contamination, the abandonment approach will be in accordance with NYSDEC Policy CP-43 – Groundwater Monitoring Well Decommissioning Policy. Details regarding the well abandonment will be documented on the Well Decommissioning Record provided in **Appendix F**.

3.5 GROUNDWATER MONITORING AND SAMPLING

Groundwater samples may be collected using various methods depending on specific project objectives. These methods may include hand bailing, pumping, or low-flow purging and sampling.

Special procedures for PFAS and 1,4-dioxane are colored in red, and additional considerations are discussed in **Section 2.5.4**.

3.5.1 Hand Bailing

3.5.1.1 Equipment and Supplies

- Field book or log forms (for PFAS sampling, no weatherproof field books permitted);
- Well gauging and sampling logs;
- Project plans;
- PPE in accordance with the HASP (for PFAS sampling, PPE should be free of PFAS-containing products, refer to **Table 1**);
- PID, or other monitoring equipment if required by HASP;
- Water level probe and/or electronic oil/water interface probe (for PFAS sampling, use only PFAS-free equipment);
- Disposable polyethylene bailers (HDPE or PVC for PFAS sampling) and/or stainless-steel bailers;
- Polypropylene rope (use PFAS free material only as shown in **Table 1**);
- Temperature, conductivity, and pH meter;
- Turbidity meter;
- Graduated 5-gallon buckets plus lids;
- Decontamination supplies;
- Plastic sheeting (HDPE only for PFAS sampling);
- Clear tape, duct tape;
- Coolers and ice;
- Laboratory sample bottles; and
- Shipping labels.

3.5.1.2 Purging

- Prior to sampling, the static water level and thickness of any light non-aqueous phase liquid (LNAPL) or DNAPL will be measured to the nearest 0.01 foot from the surveyed well elevation mark on the top of the PVC casing with a decontaminated oil/water interface probe. NAPL thickness will be confirmed using a clear bailer or a weighted string. The measurement will be recorded in the field book or log forms.
- Prior to commencing sampling activities and daily thereafter, the groundwater quality monitoring probes/meters including pH, conductivity, and turbidity will be calibrated in accordance with the manufacturer's instructions. At a minimum, two-point calibrations will be conducted for pH, conductivity, and turbidity. Calibration results will be recorded in the field log book or log forms.
- Initiate bailing of the well from the bottom. Lower and raise the bailer slowly to avoid causing turbidity. Keep the polypropylene rope on the plastic sheet. Pour the groundwater from the bailer into a graduated 5-gallon bucket to measure the volume withdrawn from the well.
- Continue bailing the well until at least three well volumes have been removed or until the well is dry. If the well is dry, allow sufficient time for the well to recover before proceeding. Record this information on the Standard Groundwater Sampling Log. An example of the Standard Groundwater Sampling Log is provided in **Appendix G.**

- During the removal of successive well volumes, measure the water temperature, pH, conductivity, and turbidity with calibrated meters. Record the data on the Groundwater Sampling Field Log.
- Purge water will be containerized for characterization and disposal in accordance with **Section 3.13**.

3.5.1.3 Sampling

- Keep sample bottles cool and with their caps on until they are ready to receive samples. For PFAS sampling, sample bottles for PFAS samples should be kept separate from other sample bottles. Be sure to change gloves prior to handling the PFAS bottleware. The type of analysis for which a sample is collected determines the type of container, preservative, holding time, and filtering requirement as specified in the QAPP.
- Minimize agitation of the water in the well; begin sampling by lowering the bailer slowly into the well. Lower it only far enough to fill it completely.
- Place a sample of well water in a container and measure and record the water temperature, pH, conductivity, and turbidity with calibrated meters. Record the data on the Groundwater Sampling Field Log. Turbidity reading should be less than 50 NTUs before sample collection. If turbidity levels remain high, consult the NYSDEC manager to discuss the possibility of having the analytical laboratory filter samples prior to analysis.
- Record the appearance of the groundwater on the Standard Groundwater Sampling Log (**Appendix G**).
- For PFAS sampling, a PFAS field blank should be collected daily during sampling activities. The PFAS field blank is a PFAS sample bottle pre-filled at the laboratory and sent with the sample bottles. Open the PFAS field blank bottle provided by the analytical laboratory and pour into an empty PFAS sample bottle. Gloves should be changed prior to handling the PFAS field blank bottle.
- When you are ready to fill the bottles, remove them from their transport containers (except for PFAS bottles). Prepare them to receive the samples.
- Samples are transferred directly from the bailer to the container. The container should hold any necessary preservative and should be correctly labeled before the sample is transferred to it. Sampling bottleware for PFAS and 1,4-dioxane, if applicable, should be sampled first. Otherwise, volatile organic compound (VOC) containers should be filled first with zero headspace, followed by other parameters, and then securely capped. Fill each sample container in accordance with the QAPP or other sampling outline.
- Inspect labels to see that the samples are properly identified.
- Return each sample bottle to its proper transport container.
- If the sample bottle cannot be filled quickly, keep them cool with the caps on until they are filled.
- Samples must not be allowed to freeze.
- Record the date and time and secure the well head.
- For PFAS sampling, a PFAS equipment blank should be collected daily from each sample set-up. The equipment blank is collected by pouring or pumping laboratory supplied and certified PFAS free water through sample apparatuses and collecting in appropriate sample bottles. Gloves should be changed prior to collecting the equipment blank sample.
- The sample containers will be labeled, placed in a laboratory-supplied cooler (keeping PFAS sample bottles separate from other sample bottles), with protective packaging (i.e. bubble wrap) and packed on ice (to maintain a temperature of 4˚C). For PFAS sampling, do not use ice packs.
- A temperature blank in the appropriate sample bottle (no Teflon® lined caps for PFAS temperature blank bottles) should accompany each cooler. VOC samples, if collected, should be placed in the same cooler, if possible, and a trip blank should accompany each cooler containing VOCs.
- For PFAS sampling, check that PFAS field blank and equipment blanks are included in the PFAS designated coolers.
- Samples for laboratory analysis will be shipped overnight or delivered to an approved NYSDOH Laboratories Approval Program (ELAP)-certified laboratory. Analyses will be conducted USEPA methodologies as specified

in the Work Assignment Scoping Documents. Samples will be managed in accordance with the QAPP. Chain-of-custody (COC) procedures will be followed as outlined in the QAPP.

3.5.2 Standard Purging

3.5.2.1 Equipment and Supplies

- Field book or field log forms (for PFAS sampling, no weatherproof field books permitted);
- Well gauging and sampling logs;
- Project plans;
- PPE in accordance with the HASP (for PFAS sampling, PPE should be free of PFAS-containing products, refer to **Table 1**);
- PID, or other monitoring equipment, if required by HASP;
- Water level probe and/or electronic oil/water interface probe (for PFAS sampling, use only PFAS-free equipment);
- Polypropylene rope (use PFAS free material only as shown in **Table 1**);
- Temperature, conductivity, and pH meter;
- Turbidity meter;
- Graduated 5-gallon buckets and lids;
- Generator;
- Extension cords;
- Decontamination supplies;
- Peristaltic or submersible pump (PFAS-free for PFAS sampling activities, refer to **Table 1**);
- Plastic tubing (HDPE for PFAS sampling);
- Plastic sheeting (HDPE for PFAS sampling);
- Clear tape, duct tape;
- Coolers and ice;
- Laboratory sample bottles; and
- Shipping labels.

3.5.2.2 Purging

- Equipment will be decontaminated prior to use at each location.
- Prior to sampling, the static water level and thickness of any LNAPL or DNAPL will be measured to the nearest 0.01 foot from the surveyed well elevation mark on the top of the PVC casing with a decontaminated oil/water interface probe. NAPL thickness will be confirmed using a clear bailer or a weighted string. The measurement will be recorded in the field book or log forms.
- Prior to commencing sampling activities and daily thereafter, the groundwater quality monitoring probes/meters including pH, conductivity, and turbidity will be calibrated in accordance with the manufacturer's instructions. At a minimum, two-point calibrations will be conducted for pH, conductivity, and turbidity. Calibration results will be recorded in the field log book or log form.
- Prepare the pump for operation. Follow the manufacturer's directions.
- Lower the pump intake to the middle of the water column for sites with unknown screen intervals and lower the pump intake to the mid-screen interval for sites with known screen intervals. For LNAPL or DNAPL sites, the pump intake depth should be biased towards the upper or lower portions of the water column, respectively.
- Pump the groundwater into a graduated 5-gallon bucket. Continue pumping until at least three well volumes have been removed or the well is pumped dry. Lower the pump's intake as necessary.

- If the well is pumped dry, allow sufficient time for the well to recover before proceeding. Record this information on the Standard Groundwater Sampling Log (**Appendix G**).
- During the removal of successive well volumes, measure the water temperature, pH, conductivity, and turbidity with calibrated meters. Record the data on the Groundwater Sampling Field Log.
- Purge water will be containerized for characterization and disposal in accordance with **Section 3.13**.

3.5.2.3 Sampling

- Keep sample bottles cool and with their caps on until they are ready to receive samples. **For PFAS sampling, sample bottles for PFAS samples should be kept separate from other sample bottles. Be sure to change gloves prior to handling the PFAS bottleware.** The type of analysis for which a sample is collected determines the type of container, preservative, holding time, and filtering requirement as specified in the QAPP.
- Place a sample of well water in a container and measure and record the water temperature, pH, conductivity, and turbidity with calibrated meters. Record the data on the Groundwater Sampling Field Log. Turbidity reading should be less than 50 NTUs before sample collection. If turbidity levels remain high, consult the NYSDEC manager to discuss the possibility of having the analytical laboratory filter samples prior to analysis.
- Record the appearance of the groundwater on the Standard Groundwater Sampling Log (**Appendix G**).
- For PFAS sampling, a PFAS field blank should be collected daily during sampling activities. The PFAS field blank is a PFAS sample bottle pre-filled at the laboratory and sent with the sample bottles. Open the PFAS field blank bottle provided by the analytical laboratory and pour into an empty PFAS sample bottle. Gloves should be changed prior to handling the PFAS field blank bottle.
- When you are ready to fill the bottles, remove them from their transport containers (except for PFAS bottles). Prepare them to receive the samples.
- Arrange the sampling containers to allow for convenient filling.
- Fill the containers that will undergo analysis. Sampling bottleware for PFAS and 1,4-dioxane, if applicable, should be collected first. Otherwise, VOC containers should be filled first with zero headspace, followed by other parameters, and then securely capped. Fill each sample container in accordance with the QAPP or other sampling outline.
- Inspect labels to see that the samples are properly identified.
- Return each sample bottle to its proper transport container.
- If the sample bottle cannot be filled quickly, keep them cool with the caps on until they are filled.
- Samples must not be allowed to freeze.
- Record the date and time and secure the well head.
- For PFAS sampling, a PFAS equipment blank should be collected daily from each sample set-up. The equipment blank is collected by pouring or pumping laboratory supplied and certified PFAS free water through sample apparatuses and collecting in appropriate sample bottles. Gloves should be changed prior to collecting the equipment blank sample.
- The sample containers will be labeled, placed in a laboratory-supplied cooler (keeping PFAS sample bottles separate from other sample bottles), with protective packaging (i.e. bubble wrap) and packed on ice (to maintain a temperature of 4˚C). For PFAS sampling, do not use ice packs.
- A temperature blank in the appropriate sample bottle (i.e., no Teflon® lined caps for PFAS temperature blank bottles) should accompany each cooler. VOC samples, if collected, should be placed in the same cooler, if possible, and a trip blank should accompany each cooler containing VOCs.
- For PFAS sampling, check that the PFAS field blank and equipment blanks are included in the PFAS sample designated coolers.
- Samples for laboratory analysis will be shipped overnight or delivered to an approved NYSDOH Laboratories Approval Program (ELAP)-certified laboratory. Analyses will be conducted using USEPA methodologies as

specified in the Work Assignment Scoping Documents. Samples will be managed in accordance with the QAPP. COC procedures will be followed as outlined in the QAPP.

3.5.3 Low Flow Purging and Sampling

3.5.3.1 Equipment and Supplies

- Field book or log forms (for PFAS sampling, no weatherproof field books permitted);
- Well gauging and sampling logs;
- Project plans;
- PPE in accordance with the HASP (for PFAS sampling, PPE should be free of PFAS-containing products, refer to **Table 1**);
- PID, or other monitoring equipment, if required by HASP;
- Water level probe and/or electronic oil/water interface probe (for PFAS sampling, use only PFAS-free equipment);
- Polypropylene rope (use PFAS free material only as shown in **Table 1**);
- Temperature, conductivity, and pH meter;
- Turbidity meter;
- Graduated 5-gallon buckets and lids;
- Flow-through cell;
- Generator;
- Extension cords;
- Decontamination supplies;
- Peristaltic or submersible pump capable of achieving flow rates of 0.5 liters per minute or less (PFAS-free for PFAS sampling activities, refer to **Table 1**);
- Plastic tubing (HDPE for PFAS sampling);
- Plastic sheeting (HDPE for PFAS sampling);
- Clear tape, duct tape;
- Coolers and ice;
- Laboratory sample bottles; and
- Shipping labels.

3.5.3.2 Purging

- Equipment will be decontaminated prior to use at each location.
- Prior to sampling, the static water level and thickness of any (LNAPL or DNAPL will be measured to the nearest 0.01 foot from the surveyed well elevation mark on the top of the PVC casing with a decontaminated oil/water interface probe. NAPL thickness will be confirmed using a clear bailer or a weighted string. The measurement will be recorded in the field book or log forms.
- Prior to commencing sampling activities and daily thereafter, the groundwater quality monitoring probes/meters including pH, conductivity, oxidation-reduction potential (ORP), dissolved oxygen, and turbidity will be calibrated in accordance with the manufacturer's instructions. At a minimum, two-point calibrations will be conducted for pH, conductivity, and turbidity. The dissolved oxygen probe will be checked against a zero-dissolved oxygen solution. In addition, the dissolved oxygen calibration will be corrected for local barometric pressure and elevation. Calibration results will be recorded in the field log book or log forms.
- Prepare the pump for operation. Follow the manufacturer's directions.
- Lower the pump intake to the middle of the water column for sites with unknown screen intervals and lower the pump intake to the mid-screen interval for sites with known screen intervals. For LNAPL or DNAPL sites,

the pump intake depth should be biased towards the upper or lower portions of the water column, respectively.

- Pump the groundwater into a graduated 5-gallon bucket. The flow rate shall not exceed 0.5 liters/min (500 ml/min). Initially, a flow rate between 200 ml/min and 500 ml/min will be used. The drawdown will be monitored using a water level probe and the flow rate will be reduced if the drawdown exceeds 0.3 ft. Efforts should be made to minimize the generation of air bubbles in the sample tubing by either increasing the flow rate as appropriate, or restricting the flow by clamping the tubing.
- Record the appearance of the groundwater on the Low Flow Groundwater Sampling Log, provided in **Appendix H**.
- During purging, pH, specific conductivity, temperature, oxidation-reduction potential (redox), dissolved oxygen, and turbidity will be monitored and recorded at time intervals sufficient to evacuate the volume of the flow-through cell. This information along with water level readings to monitor drawdown will be recorded on the Low Flow Groundwater Sampling Log. An example of the Low Flow Groundwater Sampling Log is provided in **Appendix H**.
- Well sampling will commence after equilibration of water quality parameters. The equilibration guidelines are as follows:

  - Temperature ± 3% of measurement
  - pH ± 0.1 pH units
  - Specific conductance ± 3% of measurement
  - Redox ±10 mV
  - DO ±10% of measurement
  - Turbidity ± 10% of measurement

- If the water level will not stabilize even at lower flow rates then the well will not be able to be sampled using the low flow method. In this situation, the well will be pumped to dryness and the water will be allowed to recover prior to collection of the sample. Purge water will be containerized for characterization and disposal in accordance with **Section 3.13**.

3.5.3.3 Sampling

- Prior to filling the sample bottles, the temperature, pH, dissolved oxygen, conductivity, and ORP will be measured within a flow-through cell. Turbidity will be measured with a hand-held turbidity meter. All measurements will be recorded on the Low Flow Groundwater Sampling Log (**Appendix H**). If turbidity levels remain high, consult the NYSDEC manager to discuss the possibility of having the analytical laboratory filter samples prior to analysis.
- Prior to collecting the sample, the flow-through cell will be disconnected from the tubing. Record the appearance of groundwater on the Low Flow Groundwater Sampling Log.
- Laboratory provided sample containers appropriate to meet USEPA requirements for each analysis will be used. Groundwater will be allowed to flow from the tubing into the sample container carefully so as to limit aeration of the sample. If preservative is present in a container, the container will not be overfilled.
- Keep sample bottles cool and with their caps on until they are ready to receive samples. **For PFAS sampling, sample bottles for PFAS samples should be kept separate from other sample bottles. Be sure to change gloves prior to handling the PFAS bottleware.** The type of analysis for which a sample is collected determines the type of container, preservative, holding time, and filtering requirement as specified in the QAPP.
- A PFAS field blank should be collected daily during sampling activities. The PFAS field blank is a PFAS sample bottle pre-filled at the laboratory and sent with the sample bottles. Open the PFAS field blank bottle provided by the analytical laboratory and pour into an empty PFAS sample bottle. Gloves should be changed prior to handling the PFAS field blank bottle.

- When you are ready to fill the bottles, remove them from their transport containers (except for PFAS bottles). Prepare them to receive the samples.
- Arrange the sampling containers to allow for convenient filling.
- Fill the containers that will undergo analysis. Sampling bottleware for PFAS and 1,4-dioxane, if applicable, should be sampled first. Otherwise, VOC containers should be filled first with zero headspace, followed by other parameters, and then securely capped. Fill each sample container in accordance with the QAPP or other sampling outline.
- Inspect labels to see that the samples are properly identified.
- Return each sample bottle to its proper transport container.
- If the sample bottle cannot be filled quickly, keep them cool with the caps on until they are filled.
- Samples must not be allowed to freeze.
- Record the date and time and secure the well head.
- For PFAS sampling, a PFAS equipment blank should be collected daily from each sample set-up. The equipment blank is collected by pouring or pumping laboratory supplied and certified PFAS free water through sample apparatuses and collecting in appropriate sample bottles. Gloves should be changed prior to collecting the equipment blank sample.
- The sample containers will be labeled, placed in a laboratory-supplied cooler (keeping PFAS sample bottles separate from other sample bottles), with protective packaging (i.e. bubble wrap) and packed on ice (to maintain a temperature of 4˚C). For PFAS sampling, do not use ice packs.
- A temperature blank in the appropriate sample bottle (no Teflon® lined caps for PFAS temperature blank bottles) should accompany each cooler. VOC samples, if collected, should be placed in the same cooler, if possible, and a trip blank should accompany each cooler containing VOCs.
- For PFAS sampling, check that PFAS field blank and equipment blanks are included in the PFAS sample designated coolers.
- Samples for laboratory analysis will be shipped overnight or delivered to an approved NYSDOH Laboratories Approval Program (ELAP)-certified laboratory. Analyses will be conducted using USEPA methodologies as specified in the Work Assignment Scoping Documents. Samples will be managed in accordance with the QAPP. COC procedures will be followed as outlined in the QAPP.

3.5.4 Special Considerations for Sampling Groundwater for PFAS and 1,4-Dioxane

When conducting groundwater sampling for PFAS and 1,4-dioxane, traditional best practice techniques and procedures shall be subject to modification to prevent the introduction of non-site-derived contaminants including PFAS and 1,4-dioxane into target samples as discussed in **Section 2.0. Table 1** includes a summary of prohibited and acceptable PFAS and 1,4-dioxane items. A 1,4-dioxane and PFAS sampling checklist is included as **Appendix A** and should be filled out daily by field personnel.

Quality control samples should be collected at the frequency listed below for the specified parameters and as outlined in the project-specific QAPP:

- Collect one field blank, per field team per day for PFAS.
- Collect one equipment blank per day or for every 20 field samples (1:20) for PFAS, whichever is more frequent.
- Collect one equipment blank for every 20 field samples (1:20) for all site parameters if sampling equipment is reusable (NOT disposable). Check with the data management team to determine when this sample needs to be collected.
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples.
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples.

3.6 Surface Water and Seep Sampling

Surface water samples may be collected using various methods depending on specific project objectives. At landfill sites, surface water samples will be collected directly from observed seeps if possible. A hand driven lateral point probe will be used in an attempt to collect groundwater discharge if seepage is observed but the rate is too low to sample.

For each sample collected, observations will be recorded in field logs (**Appendix I**).

Special procedures for PFAS and 1,4-dioxane are colored in red, and additional considerations are discussed in **Section 3.6.3**.

3.6.1 Equipment and Supplies

- Appropriate, pre-cleaned sample bottles will be provided by the analytical laboratory;
- Horiba U-10 (or equivalent), water quality instrument;
- Dedicated containers to collect samples (use only HDPE or stainless steel for PFAS sampling);
- PPE in accordance with the HASP (for PFAS sampling, should be free of PFAS products (see Table 1));
- Dedicated, clean cooler with ice;
- Sample logs (for PFAS sampling, no weatherproof field books permitted); and
- Digital camera.

3.6.2 Sampling

- Before collecting any data, calibrate water quality meters per manufacturer's instructions. Place sample probe into the water at each sample location and record the water temperature, pH, conductivity on sample forms (**Appendix I**).
- Water depths will be obtained at each surface water sample location.
- Surface water samples will be collected from the most downstream location proceeding to the most upstream location.
- A new pair of clean disposable latex or nitrile gloves will be donned at each sampling location.
- The water column samples will be collected facing upstream in flowing surface water systems.
- For water depths less than two feet, a surface water sample will be collected by submerging a sample bottle below the water surface taking care not to overfill the sample bottle and expelling the sample preservatives.
- For water depths between two and four feet, a water column sample will be collected using a Kemmerer® sampler, or equivalent, submerged below the water surface to an approximate depth of 60% of the total depth. The surface water sample will then be transferred from the Kemmerer® sampler, or equivalent sampler, to the laboratory sample containers.
- Keep sample bottles cool and with their caps on until they are ready to receive samples. **Sample bottles for PFAS samples should be kept separate from other sample bottles.** The type of analysis for which a sample is collected determines the type of container, preservative, holding time, and filtering requirement as specified in the QAPP.
- For PFAS sampling, a PFAS field blank should be collected daily during sampling activities. If surface water/seep sampling is occurring simultaneous with another sampling method (e.g., soil or groundwater sampling), only one field blank will be collected each day. The PFAS field blank is a PFAS sample bottle pre-filled at the laboratory and sent with the sample bottles. Open the PFAS field blank bottle provided by the analytical laboratory and pour into an empty PFAS sample bottle. Gloves should be changed prior to handling the PFAS field blank bottle.

- Hold the sample bottle (bottles with no preservatives) or dedicated HDPE sample container (for sample bottles with preservatives) at the water surface until the sample bottle or sample container is filled.
- Fill the containers that will undergo analysis. Sampling bottleware for PFAS and 1,4-dioxane, if applicable, should be sampled first. Otherwise, VOC containers should be filled first with zero headspace, followed by other parameters, and then securely capped. Fill each sample container in accordance with the QAPP or other sampling outline.
- Inspect labels to see that the samples are properly identified.
- Return each sample bottle to its proper transport container.
- If the sample bottle cannot be filled quickly, keep them cool with the caps on until they are filled.
- Samples must not be allowed to freeze.
- Record the date and time.
- For PFAS sampling, a PFAS equipment blank should be collected daily from each sample set-up. The equipment blank is collected by pouring or pumping laboratory supplied and certified PFAS free water through sample apparatuses and collecting in appropriate sample bottles. Gloves should be changed prior to collecting the equipment blank sample.
- The sample containers will be labeled, placed in a laboratory-supplied cooler (keeping PFAS sample bottles separate from other sample bottles), with protective packaging (i.e. bubble wrap) and packed on ice (to maintain a temperature of 4˚C). For PFAS sampling, do not use ice packs.
- A temperature blank in the appropriate sample bottle (no Teflon® lined caps for PFAS temperature blank bottles) should accompany each cooler.
- For PFAS sampling, check that PFAS field blank and equipment blanks are included in the PFAS sample designated coolers.
- Samples for laboratory analysis will be shipped overnight or delivered to an approved NYSDOH Laboratories Approval Program (ELAP)-certified laboratory. Analyses will be conducted using USEPA methodologies as specified in the Work Assignment Scoping Documents. Samples will be managed in accordance with the QAPP. COC procedures will be followed as outlined in the QAPP.

3.6.3 Special Considerations for Sampling Surface Water Sampling for PFAS and 1,4-Dioxane

When conducting surface water sampling for PFAS and 1,4-dioxane, traditional best practice techniques and procedures shall be subject to modification to prevent the introduction of non-site-derived contaminants including PFAS and 1,4-dioxane into target samples as discussed in **Section 2.0. Table 1** includes a summary of prohibited and acceptable PFAS and 1,4-dioxane items. A 1,4-dioxane and PFAS sampling checklist is included as **Appendix A** and should be filled out daily by field personnel.

Quality control samples should be collected at the frequency listed below for the specified parameters and as outlined in the project-specific QAPP:

- Collect one field blank, per field team per day for PFAS.
- Collect one equipment blank per day per equipment set up or for every 20 field samples (1:20) for PFAS, whichever is more frequent.
- Collect one equipment blank for every 20 field samples (1:20) for all site parameters if sampling equipment is reusable (NOT disposable). Check with the data management team to determine when this sample needs to be collected.
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples.
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples.

3.7 SEDIMENT AND SOIL SAMPLING

Sediment and soil samples, including surface soil samples and subsurface soil samples, may be collected using various methods depending on specific project objectives.

For each sample collected, observations will be recorded in the appropriate field logs, including the Sediment Sampling Log (**Appendix J**), Surface Soil Sampling Log (**Appendix K**), or the Boring Log/Drilling Record (**Appendix B**) for subsurface soil samples.

Special procedures for PFAS and 1,4-dioxane are colored in red, and additional considerations are discussed in **Section 3.7.4**.

3.7.1 Sediment Sampling

3.7.1.1 Equipment and Supplies

- Field book or field log forms (for PFAS sampling, no weatherproof field books permitted), sampling forms, project plans, camera;
- Stakes/flagging and/or GPS;
- PPE in accordance with the HASP (for PFAS sampling, PPE should be free of PFAS-containing products, refer to **Table 1**);
- Coring device, polycarbonate tubing, end caps;
- Ponar dredge (or equivalent), stainless steel auger and shovel (for PFAS sampling, such equipment should be lack coatings);
- Stainless steel bowl or disposable aluminum pans, spoons and scoops (for PFAS sampling, stainless steel or HDPE materials should be used);
- Decontamination chemicals and supplies (For PFAS and 1,4-dioxane sampling, refer to **Table 1** for prohibited/acceptable items);
- Waterproof markers (avoid for PFAS sampling), clear tape, duct tape;
- Laboratory sample containers, labels, coolers and ice;
- Chains-of custody; shipping labels, custody seals.
- Boat, if required.

3.7.1.2 Sediment Sampling Method

- Sediment sampling may be performed by boat or wading. For each core collected, observations of sediment type will be recorded in field logs (**Appendix J**).
- Sediment samples will be collected from 0-6 inch, 6-12 inch, and 12-24 inch intervals.
- Sediment samples will be collected using push core techniques or a technique that is appropriate for the site-specific sediment type.
- Push core sampling techniques employ manual penetration of sediment using a sampling device that contains a polycarbonate tube to collect the sediment core. The device includes a check valve to allow air to escape during sediment penetration and develops a vacuum to retain the core as it is recovered. It is anticipated that 2.75 or three-inch diameter polycarbonate tubes will be used. The push cores will be manually advanced to approximately 3-ft or refusal, whichever comes first. Generally, refusal represents the full sediment column consisting of the unconsolidated material.
- A Ponar dredge may be used to collect sediment samples from areas that contain coarse sediment.

- An auger and/or stainless steel shovel may be used in areas where the coring device or dredge will not penetrate (e.g., substrate primarily of rock and cobble) and the water column is thick enough to access the sediment.
- Upon retrieval, sediment cores will be processed in the field. Samples will be obtained from the inner portion of the core, avoiding sediment that has contacted the tube or sampling device, when possible.
- Samples for headspace screening will be collected. A representative portion of each sediment sample will be placed in a re-sealable plastic (e.g., Ziploc®) bag filled approximately half full. After allowing the bagged soil to warm, the tip of the sample probe attached to the PID will be inserted into the bag to measure the headspace for organic vapors.
- First, PFAS (if collected) and volatile organic compound samples will be obtained from the center of the sample and placed in sample containers. VOC containers will be filled without headspace. Refer to **Section 3.7.3** for additional procedures for collection of VOC samples. The remainder of the interval will be extruded from the core, removing the outer portion of the core from the sample. With the exception of VOC samples, which should be sampled directly from the soil without homogenization, the sample will be homogenized in a stainless-steel mixing and distributed to the appropriate sample jars. Subsequent depth intervals will be processed in the same manner for each interval collected.
- For PFAS sampling, a PFAS field blank should be collected daily during sampling activities. If sediment sampling is occurring simultaneous with another sampling method (e.g., soil or groundwater sampling), only one field blank will be collected each day. The PFAS field blank is a PFAS sample bottle pre-filled at the laboratory and sent with the sample bottles. Open the PFAS field blank bottle provided by the analytical laboratory and pour into an empty PFAS sample bottle. Gloves should be changed prior to handling the PFAS field blank bottle.
- For PFAS sampling, a PFAS equipment blank should be collected daily from each sample set-up. If sediment sampling is occurring simultaneous with another sampling method (e.g., soil or groundwater sampling), separate equipment blanks will be collected for each sampling method. The equipment blank is collected by pouring or pumping laboratory supplied and certified PFAS free water through/over sample apparatuses and collecting in appropriate sample bottles. Gloves should be changed prior to collecting the equipment blank sample.
- The sample containers will be labeled, placed in a laboratory-supplied cooler with protective packaging (i.e., bubble wrap) and packed on ice (to maintain a temperature of 4˚C). The cooler will be shipped overnight or delivered to the ELAP-certified laboratory for analysis.
- Samples for laboratory analysis will be submitted to an approved NYSDOH ELAP-certified laboratory. Analyses will be conducted using USEPA methodologies as specified in the Work Assignment Scoping Documents. Samples will be managed in accordance with the QAPP. COC procedures will be followed as outlined in the QAPP.
- Equipment will be decontaminated prior to use at each location as described in **Section 3.12**. For PFAS and 1,4-dioxane sampling, refer to **Table 1** for prohibited/acceptable items

3.7.2 Surface and Subsurface Soil Sampling

3.7.2.1 Equipment and Supplies

- Field book or field log forms (for PFAS sampling, no weatherproof field books permitted), sampling forms, project plans, camera;
- Stakes/flagging and/or GPS;
- PPE in accordance with the HASP (for PFAS sampling, PPE should be free of PFAS-containing products, refer to **Table 1**);
- Stainless steel auger and shovel (for PFAS sampling, such equipment should be lack coatings);

- Stainless steel bowl and spoons;
- Decontamination chemicals and supplies (For PFAS and 1,4-dioxane sampling, refer to **Table 1** for prohibited/acceptable items);
- Waterproof markers (avoid for PFAS sampling), clear tape, duct tape;
- Laboratory sample containers, labels, coolers and ice;
- Chains-of custody; shipping labels, custody seals.

3.7.2.2 Soil Sampling Method

- For each sample collected, observations of soil type will be recorded in field logs (Appendix B or Appendix K).
- For surface soil sampling, a decontaminated auger and/or stainless-steel shovel will be used to collect soil samples. Sample locations may be modified in the field to allow for access. Minor clearing of vegetation may be required to access sample locations. To the extent practical, efforts will be made to minimize disturbance to the soils during clearing efforts.
- For subsurface soil sampling, the soil sample will be collected directly from a direct-push Macrocore® sleeve or split spoon sampler.
- Upon retrieval, soil samples will be processed/described in the field. Samples will be obtained from the inner portion of the collected sampling apparatus (e.g., hand auger, split spoon) avoiding soil that has contacted sampling device, when possible. For PFAS sampling, if sleeves are used with the sampling device, they should be HDPE, PVC, or acetate.
- Samples for headspace screening will be collected. A representative portion of each soil sample will be placed in a re-sealable plastic (e.g., Ziploc®) bag filled approximately half full. After allowing the bagged soil to warm, the tip of the sample probe attached to the PID will be inserted into the bag to measure the headspace for organic vapors.
- First, PFAS (if collected) and volatile organic compound samples will be obtained from the center of the sample and placed in sample containers. VOC containers will be filled without headspace. Refer to Section 3.7.3 for additional procedures for collection of VOC samples. The remainder of the interval will be homogenized in a stainless-steel mixing bowl and distributed to the appropriate sample jars. Subsequent depth intervals will be processed in the same manner for each interval collected.
- For PFAS sampling, a PFAS field blank should be collected daily during sampling activities. If surface soil sampling is occurring simultaneous with another sampling method (e.g., sediment or groundwater sampling), only one field blank will be collected each day. The PFAS field blank is a PFAS sample bottle pre-filled at the laboratory and sent with the sample bottles. Open the PFAS field blank bottle provided by the analytical laboratory and pour into an empty PFAS sample bottle. Gloves should be changed prior to handling the PFAS field blank bottle.
- For PFAS sampling, a PFAS equipment blank should be collected daily from each sample set-up. If sediment sampling is occurring simultaneous with another sampling method (e.g., soil or groundwater sampling), separate equipment blanks will be collected for each sampling method. The equipment blank is collected by pouring or pumping laboratory supplied and certified PFAS free water through/over sample apparatuses and collecting in appropriate sample bottles. Gloves should be changed prior to collecting the equipment blank sample.
- The sample containers will be labeled, placed in a laboratory-supplied cooler with protective packaging (*i.e.*, bubble wrap) and packed on ice (to maintain a temperature of 4˚C). The cooler will be shipped overnight or delivered to the ELAP-certified laboratory for analysis.
- Samples for laboratory analysis will be submitted to an approved NYSDOH ELAP-certified laboratory. Analyses will be conducted using USEPA methodologies as specified in the Work Assignment Scoping Documents. Samples will be managed in accordance with the QAPP. COC procedures will be followed as outlined in the QAPP.

- Equipment will be decontaminated prior to use at each location as described in **Section 3.12**. For PFAS and 1,4-dioxane sampling, refer to **Table 1** for prohibited/acceptable items

3.7.3 Sampling Sediment and Soil for VOCs

Sediment and soil samples should be collected from the sample retrieval device using a Terra Core® Sampler.

- Where possible, sediment and soil samples should be collected immediately upon retrieval of the material and after for screening for VOCs and prior to completing sediment/soil descriptions to avoid loss of VOCs.
- Each Terra Core® sampling kit will contain one (1) to three (3) 40-mL vial for each sample (each of which contains a preservative, typically water or methanol), a small plastic sampler, and a separate plastic screw-on cup or wide-mouth jar to be used for moisture determination.
- For each Terra Core® 40-mL vial, collect 5 grams of soil by pushing the sampler into the soil allowing the plunger to be moved up. Extrude the soil from the sampler into the vial by pushing the plunger down, taking care not to plash out any preservative in the process. Upon filling the vial, secure the cap and swirl the vial such that the preservative covers the top of the soil.
- Place vials and the moisture determination bottleware into the same laboratory-provided zip lock bag for each sample collected. Record sample information on the label. If appropriate, record any vial identification numbers.
- The sample containers will then be placed in a laboratory-supplied cooler with protective packaging (i.e., bubble wrap) and packed on ice (to maintain a temperature of 4˚C). The cooler will be shipped overnight or delivered to the ELAP-certified laboratory for analysis.
- Samples for laboratory analysis will be submitted to an approved NYSDOH ELAP-certified laboratory. Analyses will be conducted using USEPA methodologies as specified in the Work Assignment Scoping Documents. Samples will be managed in accordance with the QAPP. COC procedures will be followed as outlined in the QAPP.

3.7.4 Special Considerations for Sampling Sediment and Soil for PFAS and 1,4-Dioxane

When conducting sediment and soil sampling for PFAS and 1,4-dioxane, traditional best practice techniques and procedures shall be subject to modification to prevent the introduction of non-site-derived contaminants including PFAS and 1,4-dioxane into target samples as discussed in **Section 2.0. Table 1** includes a summary of prohibited and acceptable PFAS and 1,4-dioxane items. A 1,4-dioxane and PFAS sampling checklist is included as **Appendix A** and should be filled out daily by field personnel.

For soil sampling, select samples should be tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS for the purpose of either 1) determining the extent of soil contamination, 2) remedy selection, and/or 3) assessing the suitability of imported soil backfill materials.

Quality control samples should be collected at the frequency listed below for the specified parameters and as outlined in the project-specific QAPP:

- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples.
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples.

3.8 EXPLORATORY TEST PITS/EXCAVATIONS

3.8.1 Equipment and Supplies

- Field book or field log forms (for PFAS sampling, no weatherproof field books permitted), sampling forms, project plans, camera;
- Stakes/flagging and/or GPS;
- PPE in accordance with the HASP (for PFAS sampling, PPE should be free of PFAS-containing products, refer to **Table 1**);
- PID or other monitoring equipment if required by the HASP;
- Stainless steel bowl and spoons, plastic scoops (HDPE only for PFAS sampling);
- Decontamination chemicals and supplies (For PFAS and 1,4-dioxane sampling, refer to **Table 1** for prohibited/acceptable items);
- Waterproof markers (avoid for PFAS sampling), clear tape, duct tape;
- Laboratory sample containers, labels, coolers and ice;
- Chains-of custody; shipping labels, custody seals.

3.8.2 Procedures

Test pits will allow for visual characterization of subsurface soil conditions and the collection of grab soil samples. Prior to soil sample collection, headspace screening will be conducted to evaluate whether analysis of soil samples is warranted, and if so, which soils should be collected.

At no time will field personnel or NYSDEC personnel enter a test pit/excavation unless it has been deemed safe to enter by an Excavation Competent person. The test pit/excavation may be classified as a confined space. If so, confined space entry procedures must be followed and proper personnel training in confined space procedures must be documented.

The sampling approach from test pits/excavations will be to bring soil samples to the surface to avoid entry into the test pit/excavation. A representative portion of each soil sample will be placed in a re-sealable plastic (e.g., Ziploc®) bag filled approximately half full. The bag will be labeled with the boring number and interval sampled. After allowing the bagged soil to warm, the tip of the sample probe attached to the PID will be inserted into the bag to measure the headspace for organic vapors.

Descriptions of the materials encountered in the test pit/excavation will be recorded on the Test Pit Log. An example of the Test Pit Log is provided in **Appendix L**.

Sampling of soil material for laboratory analysis should be conducted thereafter following the procedures outline in **Sections 3.7.2 to 3.7.4**. The samples collected will be submitted to an approved NYSDOH Laboratories Approval Program (ELAP)-certified laboratory. Analyses will be conducted using USEPA methodologies as specified in the Work Assignment Scoping Documents. Samples will be managed in accordance with the QAPP.

3.9 HYDRAULIC CONDUCTIVITY TESTING

3.9.1 Equipment and Supplies

- Field Book or field log forms (for PFAS sampling, no weatherproof field books permitted);
- Project plans;

- PPE in accordance with the HASP (for PFAS sampling, PPE should be free of PFAS-containing products, refer to **Table 1**);
- PID or other monitoring equipment, if required by HASP;
- Water level probe and/or electronic oil/water interface probe (for PFAS sampling, use only PFAS-free equipment);
- Slug made of inert material (for PFAS sampling, should be free of Teflon® or adhesive components);
- Pressure transducer(s) and cables (care should be taken is PFAS sampling is to be conducted, such materials typically contain Teflon® components);
- Pocket-PC or laptop;
- Polypropylene rope;
- Graduated 5-gallon buckets;
- Decontamination supplies;
- Plastic sheeting;
- Clear tape, duct tape.

3.9.2 Test Procedures

These tests involve observing the recovery of water levels toward an equilibrium level after an initial perturbation. The perturbation may be either a sudden rise or fall in water level. During a slug test, an inert rod of known volume will be quickly introduced into the well to cause a water level rise. Following equilibration of the water level the slug is removed to lower the water level. Procedures and equipment requirements may vary depending on the rate of the water-level recovery. Each well will be tested in accordance with the following procedures:

- Determine the type of test to be performed based on the following:
  - If the screened interval of the well straddles the water table, only use a rising head test;
  - If the screened interval of the well is submerged within water, then a rising and falling head test will be conducted
- Record appropriate data on the K-Test Log. An example of the K-Test Log is provided in **Appendix M**.
- Clean the downhole equipment (e.g., pressure transducer, associated cable and, if used, the bailer or slug and associated line) following the decontamination procedures provided in **Section 3.12** before initiating test(s) at each well.
- Measure and record the static water level in the well (only wells which have fully recovered to static level conditions after drilling and development should be tested).
- Pressure transducers typically contain Teflon® or other waterproof components. Care should be taken to avoid conducting slug testing before groundwater sampling in the same well. Ideally, conduct slug testing after groundwater sampling is completed for PFAS. If this cannot be avoided, an equipment blank should be collected from the transducer on the day of the slug testing.
- Connect the pressure transducer to the data logger and lower the transducer into the well to a depth that will not interfere with the insertion of the slug but does not exceed the operating range of the transducer. Secure the position of the transducer by clamping the transducer cable to the well casing using a rubber-covered clamp. If the edges of the well casing are sharp, cover them with cloth or duct tape to protect the transducer cable.
- Quickly create the water level perturbation by inserting the slug into the well. While there is no fixed requirement for the magnitude of the change in water level, it is suggested that a minimum of 20% instantaneous hydraulic head differential be created to allow collection of a suitable database.
- If another test is to be performed, allow the well to re-equilibrate prior to performing the next test. Repeat the procedures, changing settings as appropriate.

3.10 Soil Vapor Sampling

3.10.1 Equipment and Supplies

- Slide hammer;
- Stainless steel drive points;
- Teflon® tubing;
- Tubing plug or cap;
- Glass beads or clean silica sand;
- Bentonite chips or powder;
- Sampling forms;
- Helium;
- Helium tracer cell;
- Helium chamber;
- Vacuum pump.

Temporary soil vapor probes will be installed using the procedure outlined below and will be recorded on the Vapor Intrusion forms.

3.10.2 Soil Vapor Probe Installation

- Install soil vapor probes using a direct-push drill rig (e.g., GeoProbe® or similar) or manually using a slide hammer. Probes will consist of stainless-steel drive points with stainless steel screens attached to food-grade (inert) Teflon® tubing through which the soil vapor sample will be drawn.
- Attach the drive points to a drive rod (stainless-steel tube) and drive the rod to the target depth, as define in the Work Assignment Scoping Documents.
- Withdraw the drive rods from the hole, leaving the drive point and tubing.
- Place filter pack material, such as glass beads or clean silica sand, in the annular space surrounding the tubing directly above the sample point to a height of approximately 1 to 2 foot. The depth of the filter pack material should always be adequate to prevent the bentonite slurry above from going over the drive point and sample inlet screen.
- Place bentonite slurry in the annulus above the filter pack material to provide a seal in the borehole. Ideally, place the bentonite annular seal at least 3 feet thick, although adjustments to this thickness may be required based on site-specific conditions. The entire borehole must be filled to the ground surface with either entirely bentonite or with natural fill between two bentonite seals (one above the filter pack material and one at the ground surface).
- For permanent installations, install flush mounted protective covers to protect the probe and the tubing.
- Cut the end of the tubing to allow proper closure of the flush-mounted protective cover, but with a sufficient length of tubing exposed at the surface to facilitate connection of sampling equipment.
- Close or cap the sample tubing following installation and following collection of each sample.

3.10.3 Collection of Soil Vapor Samples

Record weather information (i.e., temperature, barometric pressure, rainfall, wind speed, and wind direction) at the beginning of the sampling event. Also, record substantial changes to these conditions that may have occurred over the past 24 to 48 hours and that do occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport).

- Sampling personnel must avoid activities immediately before and during the sampling that may contaminate the sample (e.g., using markers, fueling vehicles, etc.).
- Identify sampling locations on a plot plan that also identifies buildings, other landmarks, and potential sources of VOC contamination to both the surface and outdoor air. Record the depth of the probe screen below grade.
- If necessary, connect additional tubing to the tubing extending from the soil vapor probe to allow for connection to sample collection equipment.
- Calculate the volume of air in the probe, tubing (volume = π r^2h), including any additional tubing added in the step above and the annular space between the probe and the native material if sand or glass beads were used.
- Connect a vacuum pump or gas-tight syringe (~60 cubic centimeters [cc]) to the sample tubing. At a flow rate of no more than 0.2 liter per minute (lpm), purge air from the tubing until one to three of the above-calculated air volumes are removed.
- During purging, evaluate the potential for ambient air to be introduced in the soil vapor sample through the annulus of the soil vapor probe or tubing connections using a tracer gas such as helium. The procedures for the tracer gas evaluation are described below. Note that the bentonite used in the probe installation should have sufficient time to seal before the samples are collected. The tracer gas evaluation will verify if the seal is sufficient.
- Use an evacuated Summa® passivated (or equivalent) stainless-steel canister to collect the soil vapor sample. The canister will be provided by the laboratory, along with a flow controller equipped with an in-line particulate filter and a vacuum gauge. The flow controller will be pre- calibrated by the laboratory for the desired flow rate or duration of sample collection. The sampling flow rate should always be less than 0.2 lpm. The canisters will be batch certified as clean by the laboratory.
- Remove the protective brass plug from the canister. Connect the pre- calibrated flow controller to the canister.
- Record the identification numbers for the canister and flow controller. Record the initial canister pressure on the vacuum gauge (check equipment specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing laboratory should not be used for sampling. Record these numbers and values on the chain of custody form for each sample.
- Connect the tubing from the soil vapor probe to the flow controller.
- Completely open the valve on the canister. Record the time that the valve was opened (beginning of sampling) and the canister pressure on the vacuum gauge.
- Photograph the canister and the area surrounding the canister.
- Monitor the vacuum pressure in the canister routinely during sampling.
- Stop sample collection when the canister still has a minimum amount of vacuum remaining. Check with the laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but not zero. If there is no vacuum remaining, the sample will be rejected and collected again in a new canister.
- Complete the Soil Vapor (Canister) Sample Collection Field Form. An example of the Soil Vapor (Canister) Sample Collection Field Form is provided in **Appendix N**.
- Remove the flow controller from the canister and replace the protective brass plug.
- Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.
- Air samples will be analyzed by an ELAP-certified laboratory. Detection limits for the analyzed compound list will be defined by the NYSDEC and NYSDOH prior to sample submittal and outlined in the Work Assignment Scoping Documents. For specific parameters identified by NYSDOH, where the selected parameters may have a higher detection limit (e.g., acetone), the higher detection limits will be designated by NYSDOH.
- Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.

- Enter the information required for each sample on the chain-of-custody form, making sure to include the identification numbers for the canister and flow controller, and the initial and final canister pressures on the vacuum gauge.
- Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. The field crew will retain a copy of the chain-of-custody for the project file.
- Deliver or ship the samples to the laboratory within one business day of sample collection and via overnight delivery (when shipping).

Provided that no additional sampling is expected to be conducted, either pull out (if practical) or abandon in place the sampling probe. When abandoning, cut the tubing back as far down as practical and cover to surface with native soil.

3.10.4 Tracer Gas Evaluation

The tracer gas evaluation provides a means to evaluate the integrity of the soil vapor probe seal and assess the potential for introduction of ambient air into the soil vapor sample. A tracer gas evaluation should be conducted on all soil vapor probes. After the initial round of sampling and with the approval of the regulating agency, the use of tracer gas may be reduced to a minimum of 10 percent for permanent and semi-permanent probes if the initial round results showed installations with competent seals.

The following tracer gas evaluation procedure uses in-field tracer gas measurements and tracer gases (e.g., helium) that can be measured by portable detectors.

- Retain the tracer gas around the sample probe by filling an air-tight chamber (such as a plastic bucket) positioned over the sample location.
- Make sure the chamber is suitably sealed to the ground surface.
- Introduce the tracer gas into the chamber. The chamber will have tubing at the top of the chamber to introduce the tracer gas into the chamber and a valved fitting at the bottom to let the ambient air out while introducing tracer gas. A tracer gas detector will be attached to the valved fitting at the bottom of the chamber to verify the presence of the tracer gas. Close the valve after the chamber has been enriched with tracer gas at concentrations >50%.
- The chamber will have a gas-tight fitting or sealable penetration to allow the soil vapor sample probe tubing to pass through and exit the chamber.
- After the chamber has been filled with tracer gas, attach the sample probe tubing to a pump that will be pre-calibrated to extract soil vapor at a rate of no more than 0.2 lpm. Purge the tubing using the pump. Calculate the volume of air in the tubing and probe and purge one to three tubing/probe volumes prior measuring the tracer gas concentration.
- Use the tracer gas detector to measure the tracer gas concentration in the pump exhaust.
- Record the tracer gas concentrations in the chamber and in the soil vapor sample.

If the evaluation indicates a high concentration of tracer gas in the sample (>10% of the concentration of the tracer gas in the chamber), then the surface seal is not sufficient and requires improvement via repair or replacement prior to commencement of the sample collection. A non-detectable level of tracer gas is preferred; however, if the evaluation indicates a low potential for introduction of ambient air into the sample (<10% of the concentration of the tracer gas in the chamber), then proceed with the soil vapor sampling. While lower concentrations of tracer gas are acceptable, the impact of the detectable leak on sample results should be evaluated in the sampling report.

3.11 Vapor Intrusion Sampling

Three (3) types of air samples will be collected for laboratory analysis during the vapor intrusion investigation: 1) indoor air, 2) sub-slab air sample, and 3) background air sample. Procedures for obtaining these air samples are described in this section. During the vapor intrusion sampling, complete the Indoor Air Quality Questionnaire and Building Inventory. An example of the Indoor Air Quality Questionnaire and Building Inventory is provided in Appendix O.

3.11.1 Equipment and Supplies

- Hand drill with concrete bit;
- Teflon® tubing;
- Beeswax or permagum®;
- Vacuum pump or syringe;
- Sampling form;
- Inventory form;
- Camera;
- Caulk (if needed to seal hole following sample collection).

3.11.2 Sub-Slab Samples

3.11.2.1 Sub-slab Vapor Probe Installation

Temporary sampling probes will be installed using the following procedures:

- If appropriate, record weather information (i.e., temperature and wind direction) at the beginning of the sampling event. Record substantial changes to these conditions that may occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport).
- Insert a section of food-grade Teflon® or other appropriate tubing through a 3/8-inch (approx.) hole drilled through the slab. If necessary, advance the drill bit 2 to 3 inches into the sub-slab material to create an open cavity.
- Install the tubing inlet to the specified sampling depth below the slab, no further than two inches into the sub-slab material.
- Seal the annular space between the hole and tubing using 100% beeswax or another inert, non-shrinking sealing compound such as permagum®.

3.11.2.2 Sub-slab Vapor Sample Collection

Sub-slab vapor samples will be collected by following the steps outlined below.

- Purge the tubing using a vacuum pump or gas-tight syringe (~60 cc). Calculate the volume of air (volume = $\pi r^2 h$) in the tubing and purge one to three tubing volumes prior to sample collection at a rate no greater than 0.2 liter per minute (lpm).
- Use an evacuated Summa® passivated (or equivalent) canister to collect the sub-slab vapor sample. The canister will be provided by the laboratory, along with a flow controller equipped with an in-line particulate filter and a vacuum gauge. The flow controller will be pre- calibrated by the laboratory for the desired flow rate or duration of sample collection. The canisters will be batch certified as clean by the laboratory.

- Record the identification numbers for the canister and flow controller. Remove the protective brass plug from canister. Record the initial canister pressure using a digital vacuum gauge (check equipment specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing laboratory should not be used for sampling. Record these numbers and values on the chain of custody form for each sample.
- Close the valve, remove the digital vacuum gauge and connect the pre-calibrated flow controller to the canister.
  - Purging the tubing using a vacuum pump or gas-tight syringe (~60 cc). Calculate the volume of air (volume = $\pi r^2 h$) in the tubing and purge one to three tubing volumes prior to sample collection at a rate no greater than 0.2 liter per minute (lpm).
  - Use an evacuated Summa® passivated (or equivalent) canister to collect the sub-slab vapor sample. The canister will be provided by the laboratory, along with a flow controller equipped with an in-line particulate filter and a vacuum gauge. The flow controller will be pre- calibrated by the laboratory for the desired flow rate or duration of sample collection. The canisters will be batch certified as clean by the laboratory.
  - Photograph the canister and the area surrounding the canister.
- Close the valve on the vacuum pressure in the canister after the scheduled duration of sample collection. Record the date and time that the valve was closed (completion of sampling).
- Remove the flow controller from the canister. Record the final canister pressure using a digital vacuum gauge (check equipment specific instructions for taking this measurement).
- Complete the Sub-Slab Vapor (Canister) Sample Collection Field Form. An example of the Sub-Slab Vapor (Canister) Sample Collection Field Form is provided in **Appendix P**.

Note: Make sure that the canister still has a minimum amount of vacuum remaining. Check with the laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but not zero. If there is no vacuum remaining, the sample will be rejected and collected again in a new canister.

- After closing the valve, remove the digital vacuum gauge from the canister and replace the protective brass plug.
- Seal (with caulk) all holes made through the slab and remove debris, materials and or waste that may be produced during the sampling activities.
- Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.
- Air samples will be analyzed by an ELAP-certified laboratory. Detection limits for the analyzed compound list will be defined by the NYSDEC and NYSDOH prior to sample submittal and outlined in the Work Assignment Scoping Documents. For specific parameters identified by NYSDOH, where the selected parameters may have a higher detection limit (e.g., acetone), the higher detection limits will be designated by NYSDOH.
- Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.
- Enter the information required for each sample on the chain of custody form, making sure to include the identification numbers for the canister and flow controller, and the initial and final canister pressures on the vacuum gauge.
- Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. The field crew will retain a copy of the chain-of-custody for the project file.
- Deliver or ship the samples to the laboratory as soon as practical.

3.11.3 Indoor Air Samples

Prior to initiating the indoor air survey, a detailed chemical survey should be completed within the structure where the samples will be collected. Potential sources of VOCs should be identified and photographed as appropriate. Labels of indoor products should be reviewed for VOC contents; any findings must be recorded on the NYSDOH Indoor Air Quality (IAQ) Questionnaire and Building Inventory Field Form. If potential indoor air sources are present, the sources should be removed and the sampling should be postponed for a period of time.

As part of the indoor air sampling it should be established establish whether the building has a positive or negative pressure with respect to outdoors. Smoke pens may be used to help with this assessment. This may be done immediately before and immediately after indoor air sampling, but not during sampling.

Indoor air samples will be collected following the steps outlined below:

- Record outdoor weather information (i.e., temperature and wind direction) and indoor temperature at the beginning of the sampling event. Record substantial changes to these conditions that may occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport).
- Use an evacuated Summa® passivated (or equivalent) stainless-steel canister to collect the indoor air sample. The canister will be provided by the laboratory, along with a flow controller equipped with an in-line particulate filter and a vacuum gauge. The flow controller will be pre- calibrated by the laboratory for the desired flow rate or duration of sample collection. The canisters will be individually certified as clean by the laboratory.
- Place the canister at the sampling location. If the sample should be collected from breathing height (e.g., 3 to 5 feet above ground), then mount the canister on a stable platform such that the sample inlet will be at the proper height.
- Record the identification numbers for the canister and flow controller. Remove the protective brass plug from canister. Record the initial canister pressure using a digital vacuum gauge (check equipment specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing laboratory should not be used for sampling. Record these numbers and values on the chain-of custody form for each sample.
- Close the valve, remove the digital vacuum gauge and connect the pre-calibrated flow controller to the canister.
- Open the valve on the vacuum pressure in the canister. Record the date and time that the valve was opened (beginning of sampling) and the canister pressure on the vacuum gauge provided with the canister by the laboratory.
- Photograph the canister and the area surrounding the canister.
- Close the valve on the vacuum pressure in the canister after the scheduled duration of sample collection. Record the date and time that the valve was closed (completion of sampling).
- Remove the flow controller from the canister. Record the final canister pressure using a digital vacuum gauge (check equipment specific instructions for taking this measurement).
- Complete the Indoor Air (Canister) Sample Collection Field Form. An example of the Indoor Air (Canister) Sample Collection Field Form is provided in **Appendix Q**.

Note: Make sure that the canister still has a minimum amount of vacuum remaining. Check with the laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but not zero. If there is no vacuum remaining, the sample will be rejected and collected again in a new canister.

- After closing the valve, remove the digital vacuum gauge from the canister and replace the protective brass plug.

- Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.
- Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.
- Air samples will be analyzed by an ELAP-certified laboratory. Detection limits for the analyzed compound list will be defined by the NYSDEC and NYSDOH prior to sample submittal and outlined in the Work Assignment Scoping Documents. For specific parameters identified by NYSDOH, where the selected parameters may have a higher detection limit (e.g., acetone), the higher detection limits will be designated by NYSDOH.
- Enter the information required for each sample on the chain of custody form, making sure to include the identification numbers for the canister and flow controller, and the initial and final canister pressures on the vacuum gauge.
- Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. The field crew will retain a copy of the chain of custody for the project file.
- Deliver or ship the samples to the laboratory as soon as practical.

3.11.4 Ambient Air Samples

The following procedures will be followed for the collection of ambient air samples:

- Select a location upwind of the building or other area that is being evaluated.
- Record weather information (i.e., temperature and wind direction) at the beginning of the sampling event. Record substantial changes to these conditions that may occur during the course of sampling. The information may be measured with on-site equipment or obtained from a reliable source of local measurements (e.g., a local airport).
- Use an evacuated Summa® passivated (or equivalent) stainless-steel canister to collect the ambient air sample. The canister will be provided by the laboratory, along with a flow controller equipped with an in-line particulate filter and a vacuum gauge. The flow controller will be pre- calibrated by the laboratory for the desired flow rate or duration of sample collection. The canisters will be individually certified as clean by the laboratory.
- Place the canister at the sampling location. If the sample should be collected from breathing height (e.g., 3 to 5 feet above ground), then mount the canister on a stable platform such that the sample inlet will be at the proper height.
- Record the identification numbers for the canister and flow controller. Remove the protective brass plug from canister. Record the initial canister pressure using a digital vacuum gauge (check equipment specific instructions for taking this measurement). A canister with a significantly different pressure than originally recorded by the testing laboratory should not be used for sampling. Record these numbers and values on the chain-of custody form for each sample.
- Close the valve, remove the digital vacuum gauge and connect the pre-calibrated flow controller to the canister.
- Open the valve on the vacuum pressure in the canister. Record the date and time that the valve was opened (beginning of sampling) and the canister pressure on the vacuum gauge provided with the canister by the laboratory.
- Photograph the canister and the area surrounding the canister.
- Close the valve on the vacuum pressure in the canister after the scheduled duration of sample collection. Record the date and time that the valve was closed (completion of sampling).
- Remove the flow controller from the canister. Record the final canister pressure using a digital vacuum gauge (check equipment specific instructions for taking this measurement).
- Complete the Ambient Air (Canister) Sample Collection Field Form. An example of the Ambient Air (Canister) Sample Collection Field Form is provided in **Appendix R**.

Note: Make sure that the canister still has a minimum amount of vacuum remaining. Check with the laboratory supplying the canister and flow controller for the ideal final vacuum pressure. Typically, the minimum vacuum is between 2 and 5 inches of mercury, but not zero. If there is no vacuum remaining, the sample will be rejected and collected again in a new canister.

- After closing the valve, remove the digital vacuum gauge from the canister and replace the protective brass plug.
- Attach labels/tags (sample name, time/date of sampling, etc.) to the canister as directed by the laboratory.
- Air samples will be analyzed by an ELAP-certified laboratory. Detection limits for the analyzed compound list will be defined by the NYSDEC and NYSDOH prior to sample submittal and outlined in the Work Assignment Scoping Documents. For specific parameters identified by NYSDOH, where the selected parameters may have a higher detection limit (e.g., acetone), the higher detection limits will be designated by NYSDOH.
- Place the canister and other laboratory-supplied equipment in the packaging provided by the laboratory.
- Enter the information required for each sample on the chain of custody form, making sure to include the identification numbers for the canister and flow controller, and the initial and final canister pressures on the vacuum gauge.
- Include the required copies of the chain-of-custody form in the shipping packaging, as directed by the laboratory. The field crew will retain a copy of the chain of custody for the project file.
- Deliver or ship the samples to the laboratory as soon as practical.

3.12 Decontamination of Sampling Equipment

3.12.1 Decontamination Area

A temporary decontamination area lined with polyethylene sheeting will be constructed on site for use during decontamination of the drilling equipment. Water collected from decontamination activities will be collected in 55-gallon drums and managed as described in **Section 3.13** or discharged to the ground surface, where approved by NYSDEC.

3.12.2 Equipment Decontamination

The following procedures will be used to decontaminate equipment used during the field activities.

- Drilling equipment including the backhoe, bucket, and drilling rig; augers; bits; rods; tools; split-spoon samplers; and tremie pipes will be cleaned with a high-pressure, steam-cleaning unit before beginning work, following the completion of borings, wells, test pits/excavations, and prior to exiting the site.
- Tools, drill rods, and augers will be placed on polyethylene plastic sheets following pressure washing. Direct contact with the ground will be avoided.
- Augers, rods, and tools will be decontaminated between each drilling location according to the above procedures.
- The back of the drill rig and all tools, augers, and rods will be decontaminated at the completion of the work and prior to leaving the site.
- For PFAS sampling, pressure washers used to aid in equipment decontamination should be free of Teflon® tape and parts, and water used for decontamination should be demonstrated through laboratory testing or certification to be PFAS free. Water which has exhibited previous “non-detect” results for PFAS from the UCMR3 water supply testing program is also acceptable.

3.12.3 Sampling Equipment Decontamination

3.12.3.1 Equipment and Supplies

- Potable water (for EC investigations, only use a water source which has been tested for and is free of PFAS and 1,4-dioxane);
- Phosphate-free detergent (for PFAS and 1,4-dioxane sampling, refer to Table 1 for acceptable detergents such as Alconox™ or 7th Generation Free & Clear Dish Soap);
- Water, including potable water, distilled water, and/other laboratory-grade deionized water (for EC investigations, only use water sources which have been tested for and are free of PFAS and 1,4-dioxane);
- Aluminum foil (avoid using for PFAS and 1,4-dioxane sampling);
- Plastic/polyethylene sheeting (HDPE only for PFAS sampling);
- Plastic buckets and brushes; and
- PPE in accordance with the HASP (for PFAS sampling, PPE should be free of PFAS-containing products, refer to **Table 1**);

3.12.3.2 Decontamination Procedures

- Prior to sampling, non-dedicated sampling equipment (e.g., bailers, bowls, spoons, interface probes, etc.) will be washed with potable water (PFAS-free for PFAS sampling) and a phosphate-free detergent (such as Alconox™). For 1,4-dioxane and PFAS sampling, refer to **Table 1** for prohibited and acceptable detergents, and a 1,4-dioxane and PFAS sampling checklist is included as **Appendix A** and should be filled out daily by field personnel.
- Decontamination may take place at the sampling location as long as all liquids are contained in pails, buckets, etc.
- The sampling equipment will then be rinsed with potable water (PFAS-free for PFAS sampling) followed by a rinse with distilled water (substitute laboratory-provided PFAS-free water for PFAS sampling).
- Between rinses, equipment will be placed on polyethylene sheets (HDPE only for PFAS sampling) or aluminum foil (avoid for PFAS sampling), if necessary. At no time will washed equipment be placed directly on the ground.
- Equipment will be wrapped in polyethylene plastic (HDPE only for PFAS sampling) or aluminum foil (avoid for PFAS sampling) for storage or transportation from the designated decontamination area to the sampling location.

3.13 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

Field activities will generate soil and water that will require proper management. Management of these materials will comply with DER-10.

3.13.1 Soils Generated From On-Site Activities

Drill cuttings and other soils generated on-site will be presumed to be contaminated in accordance with DER-10, If these soils are to be left on ground at the end of the work day, they must be placed on protective sheeting and covered with protective sheeting in a manner that does not allow rainwater or snow melt to contact the soils thus potentially causing transport of contaminants. These soils may be disposed of within the borehole from which they were generated to within 12 inches of the ground surface, or if the site is a residential site, backfilled to within 24 inches of the ground surface. These soils will not be used as backfill if:

- they contain free-product, NAPL, or are otherwise grossly contaminated;
- the borehole is to be used for monitoring well installation;
- the borehole has penetrated an aquitard, aquiclude, or other confining layer, or has been advanced into bedrock;
- backfilling the borehole will create a significant pathway for vertical movement of contaminants. Bentonite can be added to reduce permeability.
- Soils that are not used for backfill will be containerized and characterized for disposal. If the soil is considered characteristic hazardous waste, or a solid waste, it must be managed and disposed at a properly permitted treatment, storage or disposal facility.
- Soils that are not characterized as a solid or hazardous waste may be placed at the site, or returned to the off-site location where it originated, in a manner set forth in the Work Assignment Scoping Documents.
- The soil removed from test pits will be placed back into the excavation in the same general strata from which it was removed. Soils removed from test pits/excavations will be placed on protective sheeting to minimize potential contamination of the ground surface. If drums or other containers are encountered or free product, or NAPL are present, these materials will be over-packed or otherwise containerized for appropriate off-site disposal.

3.13.2 Soil Generated Off-Site From Off-Site Activities

Soils should be containerized as they are generated. In accordance with DER-10, soils will not be allowed to be stored on an off-site location unless they are containerized. All efforts should be made to transport containerized soils back to the on-site storage area at the end of each work day.

Soils generated off-site may be disposed of within the borehole from which they were generated to within 12 inches of the ground surface, or if the site is a residential site, backfilled to within 24 inches of the ground surface. These soils will not be used as backfill if:

- they contain free-product, NAPL, or are otherwise grossly contaminated;
- the borehole is to be used for monitoring well installation;
- the borehole has penetrated an aquitard, aquiclude, or other confining layer, or has been advanced into bedrock;
- backfilling the borehole will create a significant pathway for vertical movement of contaminants. Bentonite can be added to reduce permeability.

Soils that are not used for backfill will be containerized and characterized for disposal. If the soil is considered characteristic hazardous waste, or a solid waste, it must be managed and disposed at a properly permitted treatment, storage or disposal facility.

Soils that are not characterized as a solid or hazardous waste may be placed at the site, or returned to the off-site location where it originated, in a manner set forth in the Work Assignment Scoping Documents.

3.13.3 Water

Water generated during an investigation must be initially containerized upon production. Liquids generated during field activities that exhibit visible staining, sheen, discernable odors, or free product will remain containerized for off-site disposal. These containers will be stored in a staging area designated by the NYSDEC Project Manager. The staging area will have secondary containment.

Water that does not exhibit any of these characteristics may be discharged to an unpaved area of the site as approved by the NYSDEC Project Manager.

3.13.4 Disposable Sampling Equipment and Personal Protective Equipment

Dedicated sampling equipment (soil sample liners, disposable polyethylene bailer, polypropylene line, sample tubing) and PPE will be handled and managed as solid waste, unless they contain free-product, NAPL, or are otherwise grossly contaminated, whereupon they will be containerized and characterized for disposal.

3.13.5 IDW Container Management and Waste Characterization

IDW which requires further characterization and off-site disposal will be placed in New York State Department of Transportation-approved 55-gallon 17-H type drums (or other containers, such as covered roll-offs) and affixed with appropriate labeling. Liquid waste drums will be placed within secondary containment.

If the waste requires characterization, representative samples will be obtained of each waste type (solids, liquids, etc.) upon completion of waste generation and submitted to an analytical laboratory for analysis of the disposal facilities requirements. The IDW will be classified as hazardous or non-hazardous based on characterization results and will be disposed of in accordance with applicable federal, state, and local regulations.

3.14 SITE SURVEY AND BASE MAP PREPARATION

A site survey will be conducted by a New York State licensed surveyor which incorporates soil boring locations, monitoring well locations, test pit/excavation locations, surface water and sediment locations, surface soil locations, and soil vapor locations. Horizontal locations of these sample points will be tied to New York State Plane Coordinate System using North American Datum of 1983 (NAD 83). Elevations will be tied to North American Vertical Datum of 1988 (NAVD 88). Ground elevations at the sample points will be measured to the nearest 0.1 ft. Elevations of monitoring well casings will be measured to the nearest 0.01 ft.

Unless specifically request by the NYSDEC Project Manager, detailed topographic surveys of project sites will not be conducted, nor used for base map purposes. Rather, available aerial photography will be used as the base map onto which sampling points and other mapping elements (i.e. groundwater contours, contaminant plumes, etc.) will be displayed.

TABLE

Table 1
Prohibited and Acceptable Items for Emergent Contaminant Sampling

Prohibited	Acceptable
Field Equipment	
Teflon® (PTFE) containing materials Low density polyethylene (LDPE) materials Fluorinated ethylene propylene (FEP) Ethylene tetrafluoroethylene (ETFE) Polyvinylidene fluoride (PVDF)	High density polyethylene (HDPE), stainless steel polypropylene, polyvinyl chloride (PVC), acetate, silicone. LDPE bags (e.g., Ziploc®) that do not come into direct contact with the sampling media and do not introduce cross-contamination with samples.
Waterproof field books, waterproof paper and waterproof sample bottle labels	Loose non-waterproof paper and non-waterproof sample labels, electronic forms
Plastic clipboards, binders, or spiral hard cover notebooks	Aluminum field clipboards or Masonite
Aluminum foil	
Glass	
Waterproof markers / Sharpies®	Pens
Post-It Notes®	Tape; loose leaf paper
Chemical (blue) ice packs	Wet Ice
Field Clothing and PPE	
New cotton clothing or synthetic water resistant, waterproof, or stain-treated clothing, clothing containing Gore-Tex™	Well-laundered clothing made of natural fibers (preferable cotton)
Clothing laundered using fabric softener	No fabric softener
Boots containing Gore-Tex™ or treated with water-resistant sprays	Boots made with polyurethane and PVC or PVC over boots
Coated Tyvek®	Laundered cotton clothing
No cosmetics, moisturizers, hand cream, or other related products as part of personal leaning/showering routine on the morning of sampling	Sunscreens - Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss My Face, and baby sunscreens that are "chemical free", "toxin free", or "natural". Hands should be well washed after application of handling of these products, and afterwards, powerless nitrile gloves should be worn.
Sunscreens or insecticides except as noted on right	Insect Repellents - Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellant, Herbal Armor, California Baby Natural Bug Spray, Baby Ganics Sunscreen and insect repellant - Avon Skin So Soft Bug Guard Plus - SPF 30 Lotion
	PPE potentially containing PFAS when site conditions warrant and no other materials can be used to be protective. Use of such material should be documented in the field notes.

Table 1
Prohibited and Acceptable Items for Emergent Contaminant Sampling

Prohibited	Acceptable
Sample Containers	
LDPE or glass containers	HDPE or polypropylene
Teflon®-lined caps	Unlined polypropylene caps
Rain Events	
Waterproof or resistant rain gear	Wet weather gear made of polyurethane, PVC, or rubber only; field tents that are only touched or moved prior to and following sampling activities
Equipment Decontamination	
Decon 90®, Liquinox®	Alconox® or 7th Generation Free & Clear Dish Soap
Water from an on-site well or untested water	Tested potable municipal water (for steam cleaning or initial cleaning); PFAS-free deionized water (small sampling equipment)
Food Considerations	
All food and drink, with exceptions noted on right	Bottled water and hydration fluids (i.e., Gatorade® and Powerade®) to be brought and consumed only in the staging areas
Vehicle Considerations	
Vehicle fabrics, carpets and mats may contain PFASs	Avoid utilizing areas inside vehicle as sample staging areas.

APPENDIX A 1,4-DIOXANE AND PFAS PRE-SAMPLING CHECKLIST

Site Name: ______________________ Task: ______________________

Weather (temp/precip): ______________________ Date: ______________________

Field Clothing and PPE:

☐ Ansell TNT® Powder-Free Nitrile Gloves ONLY

☐ No clothing or boots containing Gore-Tex™

☐ No clothing or boots treated with water-resistant spray

☐ Safety boots made from polyurethane and PVC or leather boots covered with overboots

☐ No materials containing Tyvek®

☐ Field crew has not used fabric softener on clothing

☐ Field crew has not used cosmetics, moisturizers, hand cream, or other related products this morning

☐ Field crew has not applied unauthorized sunscreen or insect repellant

☐ Samplers don fresh nitrile gloves for each sample collected

Field Equipment:

☐ No Teflon® or LDPE containing materials other than QED brand LDPE

☐ All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene or QED brand LDPE

☐ No waterproof field books, waterproof paper or waterproof bottle labels, waterproof markers/Sharpies®

☐ No plastic clipboards, binders, or spiral hard cover notebooks

☐ No Post-It Notes®

☐ Coolers filled with regular ice only; no chemical (blue) ice packs in possession

Sample Containers:

☐ Containers for PFASs Shipped in separate cooler

☐ Sample containers made of HDPE or polypropylene

☐ Caps are unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

☐ Wet weather gear made of polyurethane and PVC only

Equipment Decontamination:

☐ "PFAS-free" water on-site for decontamination of sample equipment; no other water sources to be used

☐ Alconox® or 7th Generation Free & Clear Dish Soap to be used as decontamination cleaning agents

Food Considerations:

☐ No food or drink on-site with exception of bottled water and/or hydration drinks (*i.e.*, Gatorade® and Powerade®) that is available for consumption only in the staging area

Vehicle Considerations:

☐ Avoid utilizing areas inside vehicle as sample staging areas

If any applicable boxes cannot be checked, the field team leader shall describe the deviations on the back and work with field personnel to address issues prior to commencement work. See additional information on the back of this form.

Sampling Equipment and Supply Summary (include brand names and serial numbers where available)

Decontamination Fluid Source(s): ______________________

Soap and other fluids used: ______________________

Gloves: ______________________ : Rope: ______________________

Sampling Equipment: ______________________

Field Team Names: ______________________

Field Team Leader Signature: ______________________

Deviation Summary:

If possible, materials identified as potentially containing PFASs should be relocated to a separate area of the site as far away as possible from the sampling location(s) and containerized if practicable. Notes should include method of response including type of materials on site and how they were moved and containerized.

Field Team Leader Name: ______________________________

Field Team Leader Signature: ____________________________ Time: ________________________

APPENDIX B TEST BORING LOG/DRILLING RECORD

Contractor: Driller: Oversight: Rig Type:	PARSONS DRILLING RECORD PROJECT NAME: PROJECT Location:	BORING/ WELL NO. Page of Location Description:
GROUNDWATER OBSERVATIONS	Date/Time Start: Date/Time Finish:	Location Plan

GROUNDWATER OBSERVATIONS			
Apparent Borehole DTW:			ft bls
Measured Water Level:			ft (TOC)
Total Depth of Well:			ft bls
Additional Comments:			

Sample Type	SPT	% Recovery	PID (ppm)	USCS Symbol	Depth (ft bls)	FIELD IDENTIFICATION OF MATERIAL	SCHEMATIC Drawing Not to Scale	COMMENTS

SAMPLING METHOD

HC = Hand Cleared (post hole)

SS= Split Spoon

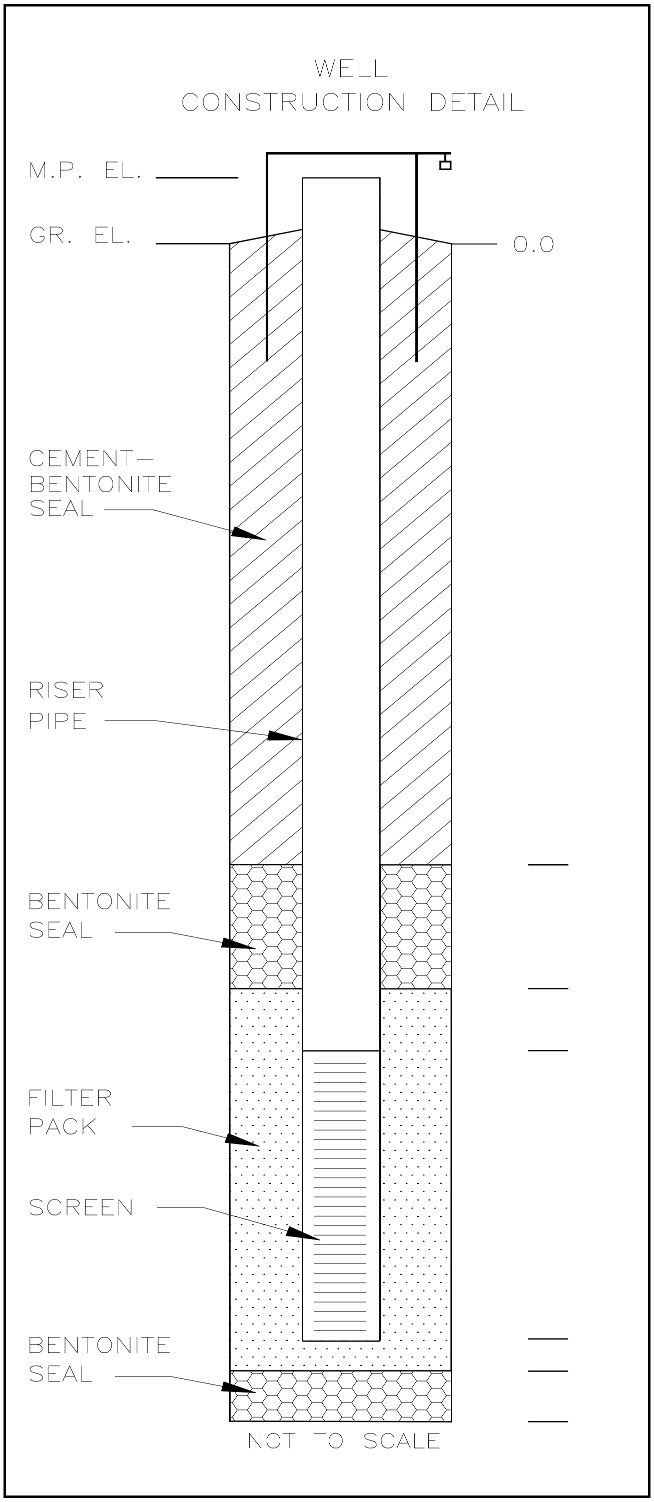
COMMENTS:

APPENDIX C WELL CONSTRUCTION LOG

WELL COMPLETION LOG

Well ID: ____________

Project: ____________
Location: ____________
Project No.: ____________
Client: ____________
Date Drilled: ____________
Date Developed: ____________



Inspection Notes:

Inspector: ____________
Drilling Contractor: ____________
Type of Well: Environmental Monitoring Well

Static Water Level (ft bmp): ____________ Date: ____________
Measuring Point: Top of PVC
Total Depth of Well (ft bmp): ____________

Drilling Method - Overburden:

Type: HSA Diameter: 4 1/4 " ID
Casing: NA

Sampling Method - Overburden:

Type: Split-Spoon Diameter: 2" OD
Weight: 140 # Fall: 30"
Interval: ____________

Riser Pipe Left in Place:

Material: Sch 40 PVC Diameter: 2" ID
Length: ____________ Joint Type Flush Thread

Screen:

Material: Sch 40 PVC Diameter: 2" ID
Slot Size: ____________ Joint Type Flush Thread

Filter Pack:

Type: Sand Grade: ____________
Interval: ____________

Seal(s):

Type: Cement-Bentonite Interval: ____________
Type: Bentonite Pellets Interval: ____________
Type: Bentonite Pellets Interval: ____________

Locking Casing: [X] Yes [ ] No

Form 002

APPENDIX D CORE LOG

	File: Corelog.xls	# CORE LOG	Hole No.:	Job No.:
			Sheet 1 of 1	Date Started:
Project:		Drilling Contractor:		Date Finished:
Client:		Driller:		Total Depth:
Purpose:		Geologist:		Ground Elev.:
Location:		Length of Casing:		S.W.L.:
Hole Location:		Casing Size:	Core Size: HQ	Inclination/Bearing: NA

Formation Member Unit			Run No. Depth	Pen. Rate (min. per foot)	Depth Scale	Lithologic Description (include in order: ROCK TYPE, color, grain size, texture, bedding, fracture & minerals.)	Core Recovery Length	Core Recovery Percent	RQD

APPENDIX E WELL DEVELOPMENT LOG

WELL DEVELOPMENT LOG

Well ID:

Date ____________ Field Personnel ____________ Weather ____________

Site Name ____________ Contractor ____________ Project No. ____________

Site Location ____________ Evacuation Method ____________ ____________

Well information:

Depth to Bottom (Initial) * ____________ ft. Date(s) Installed ____________ Date(s) Developed ____________

Depth to Bottom (Final)* ____________ ft. Driller ____________ Development Time Start: ____________

Depth to Water (Initial)* ____________ ft. Well Diameter ____________ in. Stop: ____________

Depth to Water (Final)* ____________ ft. Casing Volume ____________ gal. Total: ____________

* Measuring point ____________ Pump setting* (intake) ____________

Well Volumes	Volume of Water Removed (Gallons)	Temperature ^{o}C	pH s.u	Conductivity mS/cm	Turbidity (NTU)	Approximate Flow Rate (gal/min)	Depth to Water (ft.)	Appearance of Water
Start								
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Development Water Characteristics:

Total volume of Development water removed: ____________

Physical appearance at start

Color ____________

Odor ____________

Sheen/Free Product ____________

Physical appearance at end

Color ____________

Odor ____________

Sheen/Free Product ____________

NOTES: ____________

Geologist Signature:

APPENDIX F WELL DECOMMISSIONING RECORD

FIGURE 3

WELL DECOMMISSIONING RECORD

Site Name:	Well I.D.:
Site Location:	Driller:
Drilling Co.:	Inspector:
	Date:

DECOMMISSIONING DATA
(Fill in all that apply)

<u>OVERDRILLING</u>

Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	

<u>CASING PULLING</u>

Method employed	
Casing retrieved (feet)	
Casing type/dia. (in)	

<u>CASING PERFORATING</u>

Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	

<u>GROUTING</u>

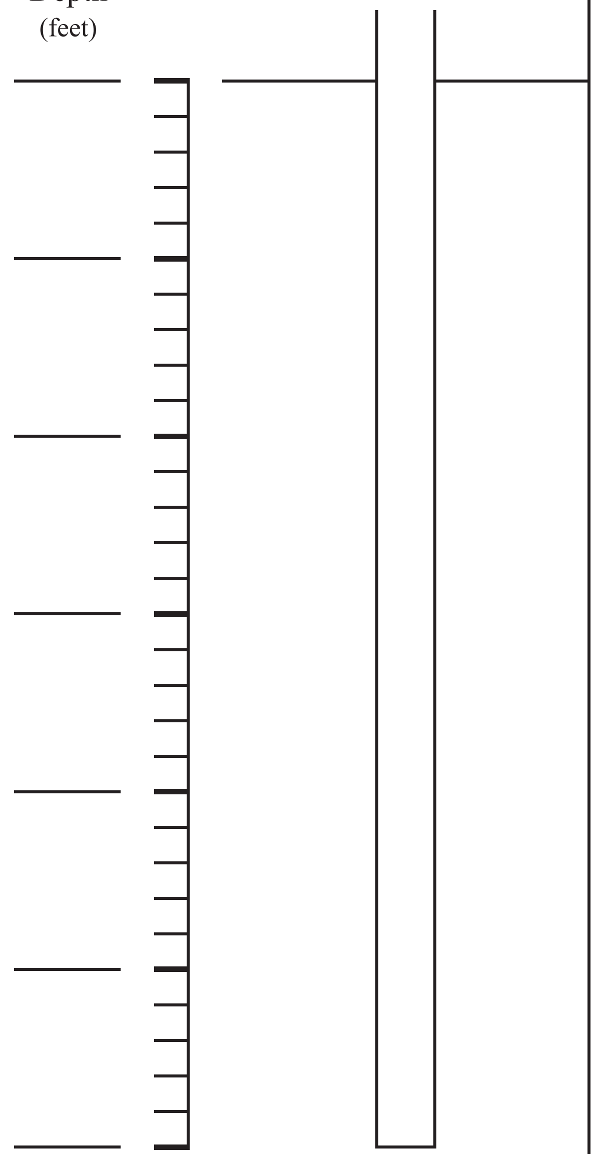
Interval grouted (FBLS)	
# of batches prepared	

<u>For each batch record:</u>

Quantity of water used (gal.)	
Quantity of cement used (lbs.)	
Cement type	
Quantity of bentonite used (lbs.)	
Quantity of calcium chloride used (lbs.)	
Volume of grout prepared (gal.)	
Volume of grout used (gal.)	

WELL SCHEMATIC*

Depth
(feet)



* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

COMMENTS:

Drilling Contractor

Department Representative

APPENDIX G STANDARD GROUNDWATER SAMPLING LOG

Standard Ground Water Sampling Log

Date ____________________
Site Name ____________________
Location ____________________
Project No. ____________________
Personnel ____________________

Weather ____________________
Well # ____________________
Evacuation Method ____________________
Sampling Method ____________________

Well Information:

Depth of Well * ____________ ft.
Depth to Water * ____________ ft.
Length of Water Column ____________ ft.
Volume of Water in Well ____________ gal.(s)
3X Volume of Water in Well ____________ gal.(s)

Water Volume /ft. for:
_______ 2" Diameter Well = 0.163 X LWC
_______ 4" Diameter Well = 0.653 X LWC
6" Diameter Well = 1.469 X LWC

Volume removed before sampling ________ gal.(s)
Did well go dry? ________

* Measurements taken from ☐ Well Casing ☐ Protective Casing ☐ ____________ (Other, Specify)

Instrument Calibration:

pH Buffer Readings		Conductivity Standard Readings	
4.0 Standard		84 S Standard	
7.0 Standard		1413 S Standard	
10.0 Standard			

Water parameters:

Gallons Removed	Temperature Readings	pH Readings	Conductivity Readings uS/cm	Turbidity Readings Ntu
initial	initial	initial	initial	initial

Water Sample:

Time Collected ________

Physical Appearance at Start		Physical Appearance at Sampling	
Color		Color	
Odor		Odor	
Turbidity (> 100 NTU)		Turbidity (> 100 NTU)	
Sheen/Free Product		Sheen/Free Product	

Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH

Notes:

APPENDIX H LOW FLOW GROUNDWATER SAMPLING LOG

Low Flow Ground Water Sampling Log

Date		Personnel		Weather	
Site Name		Evacuation Method		Well #	
Site Location		Sampling Method		Project #	

Well information:

Depth of Well *	ft.	* Measurements taken from		
Depth to Water *	ft.			Top of Well Casing
Length of Water Column	ft.			Top of Protective Casing
Depth to Intake *	ft.			(Other, Specify)

Start Purge Time: ____________

		10.0%	0.1	3%	10 mV	10%	10%	100-500 ml/min
Elapsed Time (min)	**Depth To Water (ft)**	**Temperature (celsius)**	**pH**	**Conductivity (ms/cm)**	**Oxidation Reduction Potential**	**Dissolved Oxygen (mg/l)**	**Turbidity (NTU)**	**Flow Rate (ml/min).**

End Purge Time: ____________

Water sample:

Time collected: ____________ Total volume of purged water removed: ____________

Physical appearance at start
Color ____________
Odor ____________
Sheen/Free Product ____________

Physical appearance at sampling
Color ____________
Odor ____________
Sheen/Free Product ____________

Field Test Results:
Dissolved ferrous iron: ____________
Dissolved total iron: ____________
Dissolved total manganese: ____________

Analytical Parameters:

Sample	Container Type	# Collected	Field Filtered	Preservative	Container pH

APPENDIX I SURFACE WATER AND SEEP SAMPLING LOG

PARSONS
SURFACE WATER/SEEP SAMPLING RECORD

SITE NAME: ____________________
PROJECT NUMBER: ____________________
SAMPLING DATE / TIME: ____________________
WEATHER: ____________________
SAMPLERS: __________ of __________
__________ of __________

SAMPLE ID: ____________________
SAMPLING METHOD: ____________________
DEPTH OF SAMPLE: ____________________

DESCRIPTION OF SAMPLING POINT

LOCATION: ____________________
PHYSICAL APPEARANCE: ____________________
DEPTH TO BOTTOM: ____________________
DRAINAGE DIRECTION: ____________________
UPSTREAM FROM: ____________________
DOWNSTREAM FROM: ____________________

SAMPLE DESCRIPTION

COLOR: ____________________
ODOR: ____________________
SUSPENDED MATTER: ____________________
OTHER: ____________________

FIELD TESTS

TEMPERATURE:		REDOX:	
pH:		DISSOLVED O2:	
CONDUCTIVITY:		OTHER:	

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYZE FOR: ____________________
QA/QC SAMPLE ID: ____________________
ANALYZE QA/QC SAMPLES FOR: ____________________
DATE/TIME REFRIGERATED: ____________________
CHAIN OF CUSTODY NUMBER: ____________________
SHIPPED VIA: ____________________
LABORATORY: ____________________

COMMENTS / MISCELLANEOUS ____________________

APPENDIX J SEDIMENT SAMPLING LOG

PARSONS
SEDIMENT SAMPLING RECORD

SITE NAME: ______________________
PROJECT NUMBER: ______________________
SAMPLING DATE / TIME: ______________________
WEATHER: ______________________
SAMPLERS: ____________ of ____________
____________ of ____________

SAMPLE ID: ______________________
SAMPLING METHOD: ______________________
DEPTH OF SAMPLE: ______________________

DESCRIPTION OF SAMPLING POINT

LOCATION: ______________________
PHYSICAL APPEARANCE: ______________________
DEPTH OF WATER: ______________________
DRAINAGE DIRECTION: ______________________
UPSTREAM FROM: ______________________
DOWNSTREAM FROM: ______________________

SAMPLE DESCRIPTION

TEXTURE: ______________________
COLOR: ______________________
ODOR: ______________________
OTHER: ______________________

FIELD TESTS

TEMPERATURE: ____________ REDOX: ____________
pH: ____________ DISSOLVED O2: ____________
CONDUCTIVITY: ____________ OTHER: ____________

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYZE FOR: ______________________
QA/QC SAMPLE ID: ______________________
ANALYZE QA/QC SAMPLES FOR: ______________________
DATE/TIME REFRIGERATED: ______________________
CHAIN OF CUSTODY NUMBER: ______________________
SHIPPED VIA: ______________________
LABORATORY: ______________________

COMMENTS / MISCELLANEOUS ______________________

APPENDIX K SURFACE SOIL SAMPLING LOG

PARSONS
SURFACE SOIL SAMPLING RECORD

SITE NAME: ______
PROJECT NUMBER: ______
SAMPLING DATE / TIME: ______
WEATHER: ______
SAMPLERS: ______ of ______
______ of ______

SAMPLE ID: ______
SAMPLING METHOD: ______
DEPTH OF SAMPLE: ______

DESCRIPTION OF SAMPLING POINT

LOCATION: ______
PHYSICAL APPEARANCE: ______
VEGETATION: ______
DRAINAGE DIRECTION: ______

SAMPLE DESCRIPTION

TEXTURE: ______
COLOR: ______
ODOR: ______
OTHER: ______

FIELD TESTS

TEMPERATURE: ______ REDOX: ______
pH: ______ DISSOLVED O2: ______
CONDUCTIVITY: ______ OTHER: ______

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYZE FOR: ______
QA/QC SAMPLE ID: ______
ANALYZE QA/QC SAMPLES FOR: ______
DATE/TIME REFRIGERATED: ______
CHAIN OF CUSTODY NUMBER: ______
SHIPPED VIA: ______
LABORATORY: ______

COMMENTS / MISCELLANEOUS ______

APPENDIX L TEST PIT LOG

TEST PIT LOG

SITE: ______________________ JOB #: ______________

OBG FIELD SUPERVISOR: ______________________ TEST PIT: ______________

WEATHER: ______________________ DATE: ______________

DEPTH (FT)	HNU (ppm)	DESCRIPTION
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

NOTES:

TEST PIT PLOT PLAN:

i:\71\projects\forms\pitlog.xls

APPENDIX M K-TEST LOG

	K-TEST LOG	WELL ID

Site:	**Project #**	**Personnel:**	**Page 1 of**
Client:			
Project Loc.:	**File #**		**Start date**
Test Objective:		**Weather:**	**End date**

Well information		**K-Test Information**		**Minitroll/Transducer Info**	
DTW (static head)		Screen:		Type	
Well depth		Interval (ft)		SN #	
LWC		Length (ft)		Model #	
Measurements:		Fully submerged		PSI	
TOC Casing Other		Partially submerged*			
Slug type:		Lithology:		Pocket PC: SN #	
Solid PVC		Test Method:		Laptop: SN #	
Length (ft)		Falling head			
		Rising head		Depth reading (ft)	
Water		Head change during test (ft):		Depth minitroll (ft)	
Length (ft)		Falling head		Time start	
		Rising head		Time end	
Well condition:		Recovery %: (95% optimal)		Time interval (sec/min)	
Obstructions		Falling test			
Siltation		Rising test		* If partially submerged only rising test recommended.	

Manually conducted K-Test:

Falling Test				Rising Test			
Date/Time	ET	Depth (ft)	Drawdown	Date/Time	ET	Depth (ft)	Drawdown

over →

Manually conducted K-Test:

Falling Test				Rising Test			
Date/Time	ET	Depth (ft)	Drawdown	Date/Time	ET	Depth (ft)	Drawdown

APPENDIX N SOIL VAPOR (CANISTER) SAMPLE COLLECTION FIELD FORM

Soil Vapor (Canister) Sample Collection Field Form

Project # ______________________ Consultant ______________________

Project Name ______________________ Collector ______________________

Sample ID ______________________

Vacuum gauge "zero" ("Hg) ____________

Start Date/Time ______________________ Start Pressure ("Hg) ____________

End Date/Time ______________________ End Pressure ("Hg) ____________

Canister ID ______________________ End pressure > "zero"? ____________

Flow controller ID ______________________ Sampling duration (intended) ____________

Associated ambient air sample ID ____________ Depth of sample point below grade ____________

Tubing type used ____________ Length of tubing ____________ cm Tubing volume ____________ cc

Volume purged ____________ cc @ ____________ min 1 to 3 volumes purged @ < 200cc/min? ________

Chamber tracer gas conc. ____________ Tracer gas conc. during purging ____________

Weather Conditions during Probe Installation:

Air temperature (^{o}F) ____________ Rainfall ____________ Wind direction ____________

Barometric pressure ____________ Wind speed (mph) ____________

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

____

____

Weather Conditions at Start of Sampling:

Air temperature (^{o}F) ____________ Rainfall ____________ Wind direction ____________

Barometric pressure ____________ Wind speed (mph) ____________

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

____

____

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments: ____

____

____

____

APPENDIX O INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name ______________________________ Date/Time Prepared ____________

Preparer's Affiliation ___________________________ Phone No.__________________

Purpose of Investigation____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____________________ First Name: _____________________

Address: ____

County: ______________

Home Phone: _________________ Office Phone: _________________

Number of Occupants/persons at this location ______ Age of Occupants __________________

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____________________First Name: _______________________

Address: ____

County: ______________

Home Phone: _________________ Office Phone: _________________

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: ______________

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_______________

If multiple units, how many? ________

If the property is commercial, type?

Business Type(s) ______________________________________

Does it include residences (i.e., multi-use)? Y / N If yes, how many? ______

Other characteristics:

Number of floors______ Building age______

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

____
____
____

Airflow near source

____
____
____

Outdoor air infiltration

____
____
____

Infiltration into air ducts

____
____
____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other ________
c. Basement floor:	concrete	dirt	stone	other ________
d. Basement floor:	uncovered	covered	covered with _______________	
e. Concrete floor:	unsealed	sealed	sealed with ________________	
f. Foundation walls:	poured	block	stone	other ________
g. Foundation walls:	unsealed	sealed	sealed with ________________	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: ________(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

____

____

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other ___________

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____________________________

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other____________
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

____

____

____

____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	______________________
1st Floor	______________________
2nd Floor	______________________
3rd Floor	______________________
4th Floor	______________________

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y / N

b. Does the garage have a separate heating unit? Y / N / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / NA Please specify__________

d. Has the building ever had a fire? Y / N When?__________

e. Is a kerosene or unvented gas space heater present? Y / N Where? __________

f. Is there a workshop or hobby/craft area? Y / N Where & Type? __________

g. Is there smoking in the building? Y / N How frequently? __________

h. Have cleaning products been used recently? Y / N When & Type? __________

i. Have cosmetic products been used recently? Y / N When & Type? __________

j. Has painting/staining been done in the last 6 months? Y / N Where & When? ______________

k. Is there new carpet, drapes or other textiles? Y / N Where & When? ______________

l. Have air fresheners been used recently? Y / N When & Type? ______________

m. Is there a kitchen exhaust fan? Y / N If yes, where vented?____________

n. Is there a bathroom exhaust fan? Y / N If yes, where vented?____________

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type?________________

Are there odors in the building? Y / N
If yes, please describe: ____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? ____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: ____________
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply: Public Water Drilled Well Driven Well Dug Well Other: _______

Sewage Disposal: Public Sewer Septic Tank Leach Field Dry Well Other: _______

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: ______________________________________

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:

First Floor:

12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: ______________________________________

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

APPENDIX P SUB-SLAB VAPOR (CANISTER) SAMPLE COLLECTION FIELD FORM

Sub-slab Vapor (Canister) Sample Collection Field Form

Project # ______________________ Consultant ______________________
Project Name ______________________ Collector ______________________

Sample ID ______________________
Vacuum gauge "zero" ("Hg) __________
Start Date/Time ______________________ Start Pressure ("Hg) __________
End Date/Time ______________________ End Pressure ("Hg) __________
Canister ID ______________________ End pressure > "zero"? __________
Flow controller ID ______________________ Sampling duration (intended) __________
Associated indoor air sample ID __________ Associated ambient air sample ID __________

Tubing type used __________ Length of tubing __________ cm Tubing volume __________ cc
Volume purged __________ cc @ __________ min 1 to 3 volumes purged @ < 200cc/min? __________

Weather Conditions at Start of Sampling:
Air temperature (^{o}F) __________ Rainfall __________ Wind direction __________
Barometric pressure __________ Wind speed (mph) __________
Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

____

____

Indoor air temp (^{o}F) __________ Indoor relative humidity (%) __________
Building Survey and Chemical Inventory Form Completed? __________ Photograph IDs __________

Floor Plan showing sample location, HVAC equipment, indoor air sources, preferential pathways

Comments: ____

____

____

____

____

APPENDIX Q INDOOR AIR (CANISTER) SAMPLE COLLECTION FIELD FORM

Indoor Air (Canister) Sample Collection Field Form

Project # ____________________ Consultant ____________________
Project Name ____________________ Collector ____________________

Sample ID ____________________
Vacuum gauge "zero" ("Hg) __________
Start Date/Time ____________________ Start Pressure ("Hg) __________
End Date/Time ____________________ End Pressure ("Hg) __________
Canister ID ____________________ End pressure > "zero"? __________
Flow controller ID ____________________ Sampling duration (intended) __________
Associated ambient air sample ID __________ Associated sub-slab vapor sample ID __________

Tubing type used __________ Length of tubing __________ cm Tubing volume __________ cc
Volume purged __________ cc @ __________ min 1 to 3 volumes purged @ < 200cc/min? __________

Weather Conditions at Start of Sampling:
Air temperature (^{o}F) __________ Rainfall __________ Wind direction __________
Barometric pressure __________ Relative humidity __________ Wind speed (mph) __________

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

____

____

Indoor air temp (^{o}F) __________ Indoor relative humidity (%) __________
Building Survey and Chemical Inventory Form Completed? __________ Photograph IDs __________

Floor Plan showing sample location, HVAC equipment, indoor air sources, preferential pathways

Comments: ____________________

____

____

____

____

APPENDIX R AMBIENT AIR (CANISTER) SAMPLE COLLECTION FIELD FORM

Ambient Air (Canister) Sample Collection Field Form

Project # ______________________ Consultant ______________

Project Name ______________________ Collector ______________

Sample ID ______________________

Vacuum gauge "zero" ("Hg) ________

Start Date/Time ______________________ Start Pressure ("Hg) ________

End Date/Time ______________________ End Pressure ("Hg) ________

Canister ID ______________________ End pressure > "zero"? ________

Flow controller ID ______________________ Sampling duration (intended) ________

Tubing type used ________ Length of tubing ________ cm Tubing volume ________ cc

Volume purged ________ cc @ ________ min 1 to 3 volumes purged @ < 200cc/min? ________

Weather Conditions at Start of Sampling:

Air temperature (^{o}F) ________ Rainfall ________ Wind direction ________

Barometric pressure ________ Relative humidity ________ Wind speed (mph) ________

Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

____

____

Site Plan showing sample location, building(s) being sampled, building HVAC inlet, outdoor air sources, wind direction

Comments: ____

____

____

____

____

APPENDIX E PARSONS SUBSURFACE SOIL DISTURBANCE PROTOCOL