INVENTUM ENGINEERING, PC

Pre-Design Investigation Work Plan

Riverview Innovation & Technology Campus

Brownfield Cleanup Program Site No. C915353

3875 River Road

Tonawanda, New York 14150

November 10, 2022

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List of Acronyms and Abbreviations

AA	Alternatives Analysis
AAR	Alternatives Analysis Report
ACM	Asbestos Containing Material
AJD	Approved Jurisdictional Determination
AMSL	Above Mean Sea Level
AOI	Area of Investigation
AST	Aboveground Storage Tank
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	Below Ground Surface
BMP	Best Management Practice
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
C&D	Construction and Demolition
CAMP	Community Air Monitoring Plan
CERP	Community and Environmental Response Plan
CBS	Chemical Bulk Storage
CCR	Construction Completion Report
cm/s	Centimeters per second
COG	Coke Oven Gas
CPP	Community Participation Plan
CSM	Conceptual Site Model
DOT	Department of Transportation
DOW	Division of Water
DUSR	Data Usability Summary Report
EDD	Electronic Data Deliverable
EDI	Earth Dimensions, Inc.
EIMS	Environmental Information Management System
EQ	Equalization
EWP	Excavation Work Plan
FER	Final Engineering Report
FS	Feasibility Study
ft bgs	Feet below ground surface
ft-amsl	Feet above mean sea level
FWRIA	Fish and Wildlife Resources Impact Analysis
GHG	Green House Gasses
HASP	Health and Safety Plan
HDPE	High-density polyethylene
HSA	Hollow-Stem Auger
IDW	Investigation Derived Waste
IHWS	Inactive Hazardous Waste Site
ISCO	In situ Chemical Oxidation
ISS	In situ Stabilization/Solidification
IRM	Interim Remedial Measure

Koc	Organic carbon partition coefficient
Kow	Log octanol-water partition coefficient
MCC	Maximum Concentration of Contaminates
mg/kg	Milligrams per kilogram
mL/min	Milliliters per minute
MS/MSD	Matrix spike/matrix spike duplicate
MW	Monitoring Well
NA	Natural Attenuation
NAPL	Non-aqueous Phase liquid
ng/L	Nanograms per liter
NWI	National Wetland Inventory
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOL	New York State Department of Labor
ORP	Oxidation Reduction Potential
OSC	Ontario Specialty Contracting
OU	Operable Unit
PAH	Polycyclic aromatic hydrocarbon
PBS	Petroleum Bulk Storage
PCB	Polychlorinated biphenyls
PEM	Palustrine Emergent
PFAS	Per- and Polyfluoroalkyl Substances
PID	Photoionization detector
POTW	Publicly Owned Treatment Works
Powers	Powers Coal and Coke, LLC.
PPE	Personal Protective Equipment
PDIWP	Pre-Design Investigation Work Plan
PRAP	Proposed Remedial Action Plan
PVC	Polyvinyl chloride
QAPP	Quality Assurance Project Plan
QC	Quality Control
QHHEA	Qualitative Human Health Exposure Assessment
RA	Remedial Action
RAMP	Remedial Action Monitoring Plan
RAO	Remedial Action Objectives
RD	Remedial Design
RDWP	Remedial Design Work Plan
RI	Remedial Investigation
RIR	Remedial Investigation Report
RITC	Riverview Innovation & Technology Campus, Inc.
RIWP	Remedial Investigation Work Plan
ROD	Record of Decision
RQD	Rock Quality Designation
SB	Soil Boring
SCG	Standards, Criteria, and Guidance

SCO	Soil Cleanup Objective
SGV	Standards and Guidance Values
SMP	Site Management Plan
SMR	Site Management Report
SPDES	State Pollutant Discharge Elimination System
SRIWP	Supplemental Remedial Investigation Work Plan
SS	Surface Sample
SSDS	Sub-Slab Depressurization System
SVOC	Semi-volatile organic compound
SVE	Soil Vapor Extraction
SWPPP	Stormwater Pollution Prevention Plan
TAL	Target Analyte List
TCC	Tonawanda Coke Corporation
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TCWG	Tonawanda Community Working Group
TOGS	Technical and Operational Guidance Series
TP	Test Pit
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
ug/Kg	Micrograms per kilogram
ug/L	Micrograms per liter
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U. S. Geological Survey
VISL	Vapor Intrusion Screening Levels
VOC	Volatile Organic Compound
W	Water Sample (Not Groundwater)
WOUS	Waters and Wetlands of the United States

Executive Summary

On behalf of Riverview Innovation & Technology Campus, Inc (RITC), Inventum Engineering, P.C. (Inventum) has prepared this Pre-Design Investigation Work Plan (PDIWP) for the RITC Brownfield Cleanup Program Site (BCP Site). The PDIWP has been prepared to provide data anticipated to be required for the remedial design of the remedy that will be selected and approved by the New York State Department of Environmental Conservation (NYSDEC). The scope includes activities that are appropriate for the recommended remedial alternative in the draft Alternatives Analysis Report (AAR, Inventum 2022) but also that would apply to any anticipated alternative identified by the NYSDEC. The data will be applicable to a modified recommended alternative and the selected remedial action, and therefore it is considered prudent to conduct these investigations during the winter of 2022/2023 while the site access has been cleared and remedial alternatives are being evaluated.

Data Gaps

The RI coupled with the ongoing IRMs provide a comprehensive understanding of the nature and extent of impacts on the BCP Site. The data proposed for collection herein are related to the details of the remedial design and not for the investigation or characterization of an unknown source or impact.

Pre-design Investigation Work Plan

The PDIWP has been developed to provide the sequence of activities to be completed to collect pre-design data, define the remedial design criteria, and support completion of a remedial design in an efficient manner further reducing the duration the BCP Site is restricted.

Engineering Certification

I, John P. Black certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Pre-design Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities producing the data were performed in full accordance with NYSDEC-approved work plans and any NYSDEC-approved modifications.

Respectfully Submitted,

Inventum Engineering, P.C.

Date: 2/15/2023

John P. Black, P.E.

License No: 062818-1

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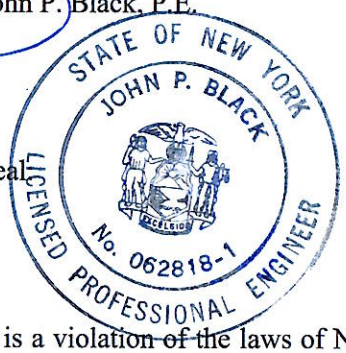

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1 Introduction

On behalf of Riverview Innovation & Technology Campus, Inc (RITC), Inventum Engineering, P.C. (Inventum) has prepared this Pre-design Investigation Work Plan (PDIWP) for the RITC Brownfield Cleanup Program Site (BCP Site) located at 3875 River Road in Tonawanda, Erie County, New York (Figure 1-1).

The PDIWP was prepared to prepare access for and collect remedial design data. The Draft Remedial Investigation Report (Draft RI Report, Inventum, 2022) for the BCP Site was submitted to the NYSDEC on March 18, 2022, and a revision was submitted July 25, 2022. The Draft Alternatives Analysis Report (AAR) for the BCP Site was submitted September 29, 2022.

1.1 PDIWP Organization

This PDIWP has been organized into the following sections:

Section 1 - Introduction
Section 2 - Pre-design Investigations
Section 3 – Reporting
Section 4 - Schedule
Section 5 - Bibliography

2 Pre-design Investigations

The pre-design investigations are proposed to collect data for the remedial designs including actions anticipated in the Production Area AOI2, Parking Lot AOI3, Coke Yard AOI4, the Coal Yard AOI5, and the South Drainage AOI7 (Figure 2-1). The purposes of these pre-design investigations are to:

- Adapt the Secondary Containment IRM Work Plan investigations (Inventum, May 2022) to the changing access conditions on the property. The inspections and concrete pre-removal requirements of the approved Work Plan will be completed and discussed with NYSDEC and NYSDOH before any changes are implemented;
- Evaluate the conditions below the building slabs and secondary containment areas in the Production Area AOI;
- Define the conditions in the Consolidation Cell Locations including, but not limited to;
    - Below Slabs;
    - Around existing Sump Locations; and
    - Below Secondary Containment Locations.
- Further quantify the understanding of the quality of fill available for onsite reuse in the Parking Lot AOI3 (Note: only pre-design data is included herein, additional testing will be required if borrow operations are implemented);
- Confirm a design in-situ solidification or excavation depth in the vicinity of MW-BCP-13B and MW-BCP-19B;
- Refine the stabilization and solidification[1] mix designs for materials to be stabilized or solidified in-situ or consolidated; and
- Refine the solidification mix design for the iron oxide pile material.

The ongoing and proposed IRMs in the Production Area AOI2, Coke Yard AOI4, Coal Yard AOI5, and the Water Treatment Area AOI6 (Groundwater, Above Ground Storage Tanks [AST], and Secondary Containment), are/will providing/provide additional design data including:

- Continuing data collection from the Groundwater Treatment IRM to confirm groundwater collection and treatment effectiveness;
- Continuing data collection and analysis for surface water quality control;
- AST closure memoranda, and inspection summaries;
- Adjusting the sampling under the secondary containment IRM Work Plan as access allows;
- Refinement of the amendments and mixing for bioremediation of petroleum impacts;
- Defining the conditions below former storage tanks ST21, ST22, and ST23; and
- Response of shallow groundwater to the collection systems in the former production area[2].

The scope of the proposed pre-design investigations includes the collection of samples for bench scale testing, quantification of the materials to be consolidated, characterization of shallow groundwater as

[1] The terms “stabilization” and “solidification” as used in this report are defined as follows: (1) “stabilization” is the addition of compounds to convert the residuals to a less mobile form, usually by changing the chemical composition of a chemical to a insoluble form, and (2) “solidification” is the addition of compounds to convert the residual to a physically more stable form that typically reduces both the mobility and toxicity.

[2] The Groundwater IRM System is monitored in accordance with the Groundwater IRM Work Plan (Inventum, 2021). The data are being compiled and analyzed on a monthly basis. The system influent consists of both groundwater and construction waters. After a steady state groundwater only flow is processed, and assessment of the system and the effluent quality will be conducted and submitted to the NYSDEC and NYSDOH.

influenced by the completed IRMs, and additional assessment of the quality of clay to be removed and suitability for use as fill in the proposed retention basin area.

A summary of the areas applicable to the proposed pre-design investigation scope is provided below:

Bench-scale Testing (see Section 2.4)

- Soil/fill below the Light Oil Area Secondary Containment.
    - The soil fill below the light oil secondary containment (including the area below the former Weak Ammonia Liquor Tanks) may contain both characteristic (benzene below the former weak ammonia Liquor tanks) and listed wastes (light oil residuals from the light oil tanks [K143 or K144]) as well as residual impacts of weak ammonia liquor.
    - The sludges in the aboveground tanks have been successfully solidified, and similar reagents will be tested on the underlying fill/soil.
    - Treatment of the underlying constituents in the listed wastes is expected to react to the same compounds as the tar, although to what extent the total concentrations are affected[3] is to be determined through the testing.
- Soils/fill below the Exhauster Building
    - The soil/fill below the exhauster building have yet to be sampled. There may be fill soils that are characteristic for benzene and will be treated using the compounds that have been successfully used to stabilize the tar-like residuals. In addition, analysis for ammonia will be completed to determine the potential for residual ammonia in fill or clay.
- Soils/fill below the Tar Management Secondary Containment
    - Depending on the condition of the secondary containment and the preparation completed when the secondary containment was constructed, the soils/fill may contain materials that could be considered listed hazardous waste. After detailed inspection of the secondary containment, if there are no penetrations through the concrete, and as there is no documentary or institutional knowledge that listed wasted were released, soils/fill under the secondary containment will be treated based on the analytical data. If there are penetrations, the soils/fill under the secondary containment with concentrations above the treatment standards for K087 or K142 will be managed as listed hazardous waste.
    - The soil/fill below the tar management area have yet to be sampled. There may be fill soils that are characteristic for benzene and will be treated using the compounds that have been successfully used to stabilize the tar-like residuals. In addition, analysis for ammonia will be completed to determine the potential for residual ammonia in fill or clay.
    - Treatment of the underlying constituents in the listed wastes is expected to react to the same compounds as the tar, although to what extent the total concentrations (Table 2-6) are affected is to be determined through the testing.

[3] The Treatment Standards (Table 2-6) for K143 and K144 are total concentrations, not TCLP leachate concentrations.

- Iron Oxide Pile
    - The residuals in the iron oxide pile contain varying concentrations of cyanide, among other less potentially toxic compounds. The concentrations of cyanide are not characteristically hazardous and the materials in the pile will be solid waste when generated. Ferrocyanides are typically not soluble in water, as evidenced by the limited areas of groundwater impact, the primary issue associated with management of the iron oxide pile and residuals in the purifier boxes are the wood fibers throughout the materials. The wood fibers are relatively pliable and make it difficult to place and compact the residual. The solidification will not alter the concentration of the cyanide, but will reduce the permeability and therefore further limit mobility of the compound.
- Viscous Tar in the TP-BCP-25 Area
    - The viscous tar in the TP-BCP-25 area is both mobile and potentially characteristic for benzene. The bench-scale testing will be to identify compounds and ratios to be blended into the viscous tar to solidify the material as well as eliminate the characteristic of toxicity, if detected.
    - In addition, analysis for ammonia will be completed to determine the potential for residual ammonia in fill or clay.

- Blue-stained fill in the TP-BCP-35 Area
    - The residuals in the TP-BCP-35 contain varying concentrations of cyanide, among other less potentially toxic compounds. The concentrations of cyanide are not characteristically hazardous and the materials in the layer of blue-stained fill would be a solid waste if generated. Ferrocyanides are typically insoluble, as evidenced by the limited areas of groundwater impact, the primary issue associated with management of the blue-stained fill are the wood fibers throughout the materials. The wood fibers are relatively pliable and make it difficult to place and compact the residual. The solidification will not alter the concentration of the cyanide, but will reduce the permeability and therefore the mobility of the compound.
    - In addition, analysis for ammonia will be completed to determine the potential for residual ammonia in fill or clay.

Quantification of Materials to be Stabilized In-situ or Consolidated

- Soils/fill below the Light Oil Area – Volume potentially impacted by light oil – visual and olfactory estimate. Sampling and analysis will be required during remedial action in accordance with the RAWP;
- Soil/fill below the former Exhauster Building (inc. Sumps) - Volume potentially impacted by lubricating oil – visual and olfactory estimate. Sampling and analysis will be required during remedial action in accordance with the RAWP;
- Soil/fill below the Tar Management Secondary Management Containment - – visual and olfactory estimate. Sampling and analysis will be required during remedial action in accordance with the RAWP; and
- Soils/fill below the former Compressor Building - Volume potentially impacted by lubricating and fuel oil – visual and olfactory estimate. Sampling and analysis will be required during remedial action in accordance with the RAWP.

Characterization of Shallow Groundwater

- Flow - Monitoring Well, Piezometer, Staff Gauges, and Collection Sump Gauging; BCP, Site 109, Site 110, and 3821 River Road; and
- Quality – Sampling to identify sources of ammonia, benzene, and mercury.

Borrow Source Evaluation

- Proposed Retention Basin Soil testing.

The sample locations and numbers of samples to be collected during the pre-design investigation are shown on Figure 2-1 and in Tables 2-1 to 2-4. For reference Figure 2-2 shows the RI and Pre-design Sample Locations. The sample collection will involve collection of groundwater samples from selected monitoring wells (Table 2-2), samples and observations in Test Pits (Table 2-3), clay samples from a series of soil borings (Table 2-3), and grab samples for bench-scale testing (Table 2-4). All sampling and analysis shall be completed in accordance with the Health and Safety Plan (HASP, Appendix A), Quality Assurance Project Plan (QAPP Appendix B), and Community Air Monitoring Plan (CAMP, Appendix C).

2.1 Groundwater Sampling

Groundwater sampling is proposed to refine the identification of the locations affecting surface water quality, primarily ammonia, benzene, and mercury. While the presence and distribution of those compounds is the primary target of the pre-design sampling, additional parameters will be collected from selected monitoring wells (Table 2-2) to confirm the current understanding of the BCP Site groundwater regime.

Liquid level measurements[4] (Table 2-1) will be collected from all the monitoring wells. The depth to groundwater will be measured in all monitoring wells, piezometers, and collection system sumps (see Table 2-1). If accessible, groundwater elevation measurements will be collected from monitoring wells at the surrounding Sites 108, 109, 110, and 3821 River Road. Water elevations will be recorded at all BCP Site staff gage locations. Depth and elevation measurements will be collected prior to the collection of any analytical samples. The depth to water and overall total depth of the well will be collected using an oil/water interface probe and recorded in a field notebook. The presence of any non-aqueous phase liquid (NAPL) will also be recorded. The total depth of the well will be verified to determine if any significant sediment accumulation has occurred. Redevelopment may be required prior to sampling if sediment has accumulated above the bottom of the screened interval.

Monitoring wells to be sampled (Table 2-2) will be purged a minimum of three well volumes or until dry. The monitoring wells will be purged using a bailer or peristaltic pump prior to collecting groundwater samples. Field measurements of pH, temperature, conductivity, turbidity, dissolved oxygen, and oxygen reduction potential (ORP) will be recorded over at least three intervals during the purging process.

Groundwater samples will be collected with a bailer or with dedicated polyethylene tubing and a peristaltic pump. The metals samples, where specified, shall be both for total and filtered analyses. Groundwater samples will be packed in coolers with ice and delivered by courier to the New York State Certified Laboratory.

[4] For purposes of developing an indication of groundwater surface(s), if possible, water level measurements will be coordinated and measured across the BCP Site, Site 110 and Site 109 in a single day.

2.2 Test Pits

Test pits will be advanced using traditional excavation equipment. Access to the locations of Test Pits TP-BCP-56 through TP-BCP-61[5] will require removal of the former building and secondary containment slabs. The slabs will be cleaned prior to removal to remove all loose and surface accumulations of process residuals. The concrete in the Light Oil Area and Tar Management Area came into contact with listed hazardous wastes. The concrete in these areas will be decontaminated in accordance with NYCRR Part 376.4(g), Table 1 "Abrasive Blasting: Removal of contaminated debris surface layers using water and/or air pressure to propel a solid media (e.g., steel shot, aluminum oxide grit, plastic beads). Brick, Cloth, Concrete, Paper, Pavement, Rock, Wood: Removal of at least 0.6 cm of the surface layer; treatment to a clean debris surface. "Clean debris surface" means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area."

The slabs will be lifted and staged in segregated concrete staging areas allowing sampling and characterization of the concrete from each independent structure. The concrete will be sampled to determine the characteristics of the concrete for disposal or reuse. The concrete will be sampled in accordance with Table 2-5 unless the criteria of 6 NYCRR Part 376.4(g)(3) are met; "Abrasive Blasting: Removal of contaminated debris surface layers using water and/or air pressure to propel a solid media (e.g., steel shot, aluminum oxide grit, plastic beads)".

The samples, if contaminated debris surface layers cannot be removed, will be collected by selecting representative pieces of the concrete and pulverizing the concrete to a size that can be analyzed by the laboratory. The results for the concrete from the light oil area and the tar management area will be compared to the treatment standard concentrations in Table 2–6 for K143 (Light Oil) and K087 and K142 (Tar Management).

During Test Pit excavation careful attention will be followed so that no more than two vertical feet of soil is removed with each scoop of the excavator. Test Pits will extend a minimum of 50-feet in length in selected areas (Figures 2-1 and 2-2 and Table 2-3). Test Pits will be extended as surface and subsurface conditions dictate/allow, based on consultation with NYSDEC field staff, and to delineate the extent of the target material including into the underlying clay. Test pits will extend via no greater than two-foot vertical increments to the depth that field indicators (visual, olfactory, and instrument [PiD] based) dictate. The elevation of the ground surface and top of clay will be recorded in the field logs for each test pit. For longer test pits, multiple measurements along the length (no less than 10-foot point to point, and at each end) of the trench will be recorded.

Observation of excavated soils/fill and field screening with a PID (10.6eV lamp) will be made directly from each exposed interval. After screening, soil will be temporarily stockpiled adjacent to the excavation and a minimum of 2-feet from the edge. Samples that are submitted for analytical characterization will be collected directly from the wall of the test pit up to 3-feet bgs. Samples collected from intervals deeper than 3-feet bgs will be collected directly from the excavator bucket. All test pit samples will be collected using a dedicated disposable stainless-steel spoon. Samples collected from test pits will, to the greatest extent

[5] Test Pit TP-BCP-60 is shown for clarity and listed in the table but will be advanced in accordance with the Sampling and Analysis Work Plan, Former Pump House (Inventum, 2022), after approval.

practicable, be biased to areas within the excavation exhibiting the greatest degree of potential contamination based on visual observation, odor, and PID screening. Multiple samples may be required if the indication of impact suggests different intervals of potential PAH and Ammonia impact. Specific ammonia samples shall be collected in addition to the full suite samples should an independent area of potential ammonia impact be identified. Under no circumstances will anyone be allowed to enter a test pit with flowing water or that is greater than three feet deep.

If below grade utilities are encountered, they will be documented to identify:

- Location and orientation
- Type of utility – water, sewer, electrical process (tar, oil, Coke Oven Gas [COG])
- Contents – Type and volume
- Evidence of release

Within the footprint of the slab or secondary containment the utility will be mapped, and the location measured with the onsite GPS. The location and orientation at the edge of the slab or secondary containment will be documented for use in the remedial design.

Any underground storage tanks encountered will be removed in accordance with NYSDEC tank abandonment regulations.

Photographs of each test pit will be taken. Photographs of any significant features exposed by the test pit (ex. buried debris, viscous tar seeps, etc.) will be collected after the final depth is reached. All pertinent information will be recorded in the field notebook or on test pit logs.

2.3 Soil Borings

Four soil borings (SB-BCP-01 through SB-BCP-04) will be advanced in the northwest corner of the BCP Site to allow collection of samples for characterization as unclassified fill for construction of the cover. The soil borings will be advanced using hollow stem augers and split-barrel sampling at the locations shown on Figure 2-2 and samples will be collected in accordance with Table 2-3. Samples will be collected 2-, 7-, 12-, and 17-feet (16 samples total) below the fill/clay interface. Samples will be collected in accordance with Table 5.4 (e) 10 of DER-10 and will effectively represent 5,000 cubic yards of borrow material sampling.

Four additional samples (Table 2-3) will be collected for a suite of geotechnical analysis:

- Moisture content;
- Plasticity Index; and
- Standard Proctor compaction analysis.

The sample for the compaction testing will be composites from the augers.

Two additional borings will be advanced in the vicinity of the northwest corner of the former exhauster building location:

One soil boring (SB-BCP-05) will be advanced immediately adjacent to the Secondary Cooler Sump. Access is available now that the secondary cooler and tar precipitator and associated piping have been removed. The boring will be advanced as close to the side of the sump as practicable and will be sampled continuously to 40-feet BGS using a split-barrel sampler. Samples of the soil surrounding the sump will be collected and tested in accordance with Table 2-3. The target intervals

will be the interval of clay with the highest indication of impact (visual, olfactory, and PiD) and the sample collected at 40-feet BGS.

A second soil boring (SB-BCP-06) will be advanced through the gravel fill in the sump. The boring will be advanced through the gravel fill to any underlying residual. The sample shall be collected using a disposable sediment sampler attached to the bottom of the sample tools. A sample of the residual will be collected and tested in accordance with Table 2-3.

Every sample will be classified for lithology, color, odor, and field screened with a PID. Analytical samples will be collected from the clay and residual in accordance with Table 2-3. Additional samples for analytical analysis may be collected based on field observations indicating potential contamination, including, but not limited to, intervals of suspect ammonia concentrations.

The sample tools will be used to attempt to collect a sample from the bottom of the open sump near the location of the filled sump (SB-BCP-07). The target of this sampling effort will be any residual below the aqueous phase in the open sump. The sample shall be collected using a disposable sediment sampler attached to the bottom of the sample tools. The sample, if any residual is recovered, will be tested in accordance with the grab sample suite in Table 2-3.

2.4 Bench-scale Grab Samples

Bench-scale testing samples (SS-BCP-21 through SS-BCP-28) will be collected at the locations shown on Figure 2-1 and submitted for analytical analysis in accordance with Table 2-4. Grab samples will be biased to materials within a zone of impact that are clearly identifiable either visually, with a PID, or by odor. Grab samples for bench-scale testing will be collected either using hand tools or with an excavator. Bench-scale testing samples will be collected in new 5-gallon containers with splits for the pre-treatment analyses placed directly into clean laboratory provided bottle ware. The bench-scale samples will be carefully described, screened with a PID, and transferred to the onsite sample preparation room.

The bench scale tests will be used to confirm the materials can be suitably solidified for stable placement in the consolidation areas (Table 2-4). The initial testing will be conducted with Lime Kiln Dust and Coke Breeze. The coke breeze will be sourced on the BCP Site. If effective, a petition for a beneficial use determination (BUD) substantially complying with 6 NYCRR Part 360.12(d) will be submitted. If a satisfactory result cannot be achieved with those materials, Portland cement and sawdust will be tested. Quicklime shall not be used due to the high heat of hydration.

The initial ratios will be selected based on the moisture content of the samples. Typically the following mix designs will be trialed:

Additive	**Mix 1**	**Mix 2**	**Mix 3**
Lime Kiln Dust	5%	10%	15%
Coke Breeze	5%	10%	10%

Each mix sample shall consist of no less than 1,000 grams of untreated material. The sample shall be weighted, and the appropriate ratios of additives shall be added and thoroughly mixed for 2 minutes. All

sample and additive weights and observations shall be recorded in a field book. The mixture shall be allowed to hydrate for 24-hours. During hydration, the temperature shall be recorded every 15-minutes for the first two hours. If the temperature rises above 130-degrees Fahrenheit, continue monitoring the temperature until the temperature stabilizes. If any smoldering occurs, quench the sample with potable water and place the sample outdoors.

After 24-hours, place 50 grams of the sample in a paint filter and observe. Note the consistency, pliable, dry, solid. The mix or mixes selected for analytical testing will be the samples with the lowest addition rates that have no free liquid but are of a consistency that can be managed with conventional earthmoving equipment.

After the analytical samples have been selected, all untreated and remaining treated materials shall be placed in the thaw shed.

The analytical results shall be tabulated and compared to the hazardous toxicity characteristics and (the Light Oil and Tar Management Area samples) to the treatment standards in Table 2-6 to determine if the materials potentially impacted by listed wastes in either the light oil area or the tar management area meet the alternate treatment standards for contaminated soil [6 NYCRR Part 376.4(k)]. Should any sample exceed the toxicity characteristic, additional bench-scale testing shall be conducted with Portland cement. Samples from the Light Oil and Tar Management Areas that exceed the treatment standard shall be highlighted.

2.5 Survey

Grab sample locations, soil borings, and test pits will be surveyed with onsite GPS equipment from a datum established by a surveyor licensed in the state of New York consistent with standard technical practices. Horizontal locations will reference the North American Datum of 1983 and the New York State Plane system (west zone) and be accurate to within ±0.1 foot. Vertical elevations from the ground surface and top of casing (TOC) will be referenced to the North American Vertical Datum of 1988 and reported in feet above mean sea level. Vertical measurements will be accurate to within ±0.01 foot.

The locations of samples will be documented with the onsite GPS equipment reference to the established datum. Specifically, but not limited to, the following will be located by GPS:

- Soil Borings;
- Test Pits and top of clay in test pits;
- Buried utilities identified during the Pre-Design Investigation; and
- Grab sample locations.

2.6 Community Air Monitoring

The air monitoring program during the Pre-deign Investigation will be conducted in accordance with the Community Air Monitoring Plan (CAMP) provided in Appendix D. Three (3) perimeter air monitoring units (1 Upwind and 2 Downwind) were installed on the BCP Site on April 29, 2020 (Appendix D). These units are fixed to monitor perimeter air quality and their location will not be adjusted as work area(s) shift over the course of the design investigations except when the work would undermine the units.

Additional air monitors (PID and particulate meters) will be utilized to monitor downwind air quality more locally to the Test Pit and areal delineation work area(s) during active work shifts. The location of these work area specific perimeter air monitors will be adjusted as necessary as the work area shifts and/or with

noticeably sustained shifts in prevalent wind directions. A weather station has been installed at the upwind monitoring station and will be a guide to determine prevalent wind direction. The prevalent wind direction and the location of the air monitors will be documented daily.

2.7 Field Modification Notifications

The NYSDEC BCP PM, or their designated representative, will be notified via electronic mail and telephone if the following conditions occur:

- Field activities are delayed and/or rescheduled due to unsafe or unsuitable weather conditions and/or equipment malfunctions.
- Proposed test pit locations must be relocated more than 25-feet from the location shown in the PDIWP due to surface or subsurface conditions preventing completion of the test pit to the desired depth or unforeseen hazardous overhead conditions.
- Proposed monitoring well clusters must be relocated more than 25-feet from the location shown in the PDIWP due to surface, subsurface or overhead conditions preventing completion of the boring and installation of a representative well.

3 Reporting

The pre-design investigation tasks will be incorporated into the remedial design after a remedial alternative is selected. To provide an ongoing transfer of information, the following reporting is proposed:

1. Groundwater IRM – 2022 Data Summary (Due January 2023) – A summary of the data collected during the startup and operation of the groundwater IRM treatment system including influent, effluent, and groundwater elevation data.
2. ASTs – Ongoing weekly reports in accordance with the Aboveground Storage Tank Management Interim Remedial Measures Work Plan (Inventum, 2021).
3. Secondary Containment – Inspection Memoranda, within two weeks of inspections being completed, including photographs and identified cracks or penetrations. If OSC is immediately moving to Closure, a single report will be submitted (see 4.).
4. Secondary Containment – Closure Reports, within 2 weeks of decontamination or sample data receipt, whichever is later, following decontamination, including additional detail of surface inspections and analytical testing in accordance with the Secondary Containment IRM Work Plan – Closure (Inventum, 2021).
5. Pre-Design Investigations – Summary memorandum of each slab or secondary containment test pit, sampling, bench-scale testing, and quantity estimates as applicable. The summary memorandum will be submitted no later than two-weeks after the last set of data for the specific unit is available from the laboratory.

4 Schedule

The proposed schedule for the pre-design investigations is expected to take 3 to 5 months overall. Within that overall timeframe:

- Surface preparation, slab cleaning – 6 weeks (Light Oil Area may be delayed due to timing of tank removals)
- Surface inspections and documetation – 6 weeks (Concurrent with surface preparation)
- Slab removals – 8 weeks (staggered)
- Test pit excavation and sampling – 8 weeks (staggered)
- Bench-scale testing – 12 weeks (Some may require additional trials)

5 Bibliography

The bibliography provides a list of documents used in conjunction with numerous BCP Site visits, discussions with NYSDEC personnel, IRM data and observations, and expertise at coke making facilities to develop this pre-design investigation work plan.

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3. Inventum Engineering, 2019b, Brownfield Cleanup Program (BCP) Application, September.

4. Inventum Engineering, 2020a, Citizen Participation Plan, Riverview Innovation & Technology Campus, BCP Site No. C915353, March.

5. Inventum Engineering, 2020b, Storm Water Pollution Prevention Plan, Riverview Innovation & Technology Campus, BCP Site No. C915353, June.

6. Inventum Engineering, 2020c, Interim Site Management Plan, Riverview Innovation & Technology Campus, BCP Site No. C915353, April.

7. Inventum Engineering, 2020d, Light Oil Area Storm Water Characterization Sampling Work Plan, March.

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9. Inventum Engineering, 2020f, Surface Water System Maintenance Work Plan, June.

10. Inventum Engineering, 2020g, Site Management Work Plan, Scope No. 2, June.

11. Inventum Engineering, 2020h, Mixing Pad Dewatering IRM Work Plan, July.

12. Inventum Engineering, 2020i, Coal and Coke Excavation Work Plan, July.

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14. Inventum Engineering, 2020k, Drum and Container Management Work Plan, August.

15. Inventum Engineering, 2020l, Abandoned Pipeline IRM Work Plan, August.

16. Inventum Engineering, 2020m, Placement of Unrecovered Coal Yard Stockpiles, October.

17. Inventum Engineering, 2020n, Surface Water System Maintenance Phase 1 Report, Phase 2 Work Plan, October.

18. Inventum Engineering, 2020o, Remedial Investigation Work Plan, October.

19. Inventum Engineering, 2020p, South Ditch Road Restoration and Improvement, Surface Water System Maintenance, Phase 3 Work Plan, November.

20. Inventum Engineering, 2021a, Aboveground Storage Tank Management Interim Remedial Measures Work Plan, January.

21. Inventum Engineering, 2021b, Access Improvement Work Plan, ACM Abatement, Coal Crushing Building, February.

22. Inventum Engineering, 2021c, Demolition Work Plan, March.

23. Inventum Engineering, 2021d, Surface Water System – Next Steps, April.

24. Inventum Engineering, 2021e, CBS and PBS Tank Closure Work Plan, April.

25. Inventum Engineering, 2021f, Secondary Containment IRM Work Plan – Closure, May.

26. Inventum Engineering, 2021g, Supplemental Remedial Investigation Activities, June.

27. Inventum Engineering, 2021h, Surface Water System Maintenance, IRM Work Plan, Concrete-lined Settling Ponds, July.

28. Inventum Engineering, 2021i, Abandoned Pipeline IRM Construction Completion Report, July.

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30. Inventum Engineering, 2021k, Coke Oven Gas Pipe and Coke Oven Gas Pipe Residuals Interim Remedial Measures Work Plan, October.

31. Inventum Engineering 2021l, Lime Still – IRM Work Plan, October.

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33. Inventum Engineering, 2021n, Material Classification, Boiler House and Battery Stack, Redevelopment Activities, March.

34. Inventum Engineering, 2021o, Letter of Condemnation, Buildings on Former Tonawanda Coke Corporation Property, Compressor Building, Purifiers, Coke Battery No. 2, and Former Light Oil Building, February.

35. Inventum Engineering, 2021p, Demolition Work Plan, Boiler House and Battery Stacks, May.

36. Inventum Engineering, 2022a, Groundwater IRM Work Plan – Addendum, West Production Area, March.

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42. New York State Department of Environmental Conservation, 2010, CP-51: Soil Cleanup Guidance Policy, October.

43. New York State Department of Environmental Conservation, 2015, "Order on Consent, File No. 14-59, R9-20141203-96", June 12.

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45. NYSDEC, 2017, State Pollutant Discharge Elimination System Permit (SPDES), Issued to Tonawanda Coke Corporation, Expires May 31, 2022, Issued June 1.

46. New York Statement Department of Environmental Conservation (NYSDEC), 2019, "Oblique Aerial Photographs, DJI_0001 to DJI_0999" December.

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48. Weston Solutions, "Tonawanda Coke Site Figure 2: Site Wide Map", October 2018

Tables

Table 2-1
Groundwater Elevation Data and Monitoring Locations
Riverview Innovation Technology Campus
BCP Site No. C915353
Remedial Investigation
Groundwater Elevation Data

Site	Well ID	Easting (x)	Northing (y)	TOC (ft.AMSL)	DTW (ft.BTOC)	DTW (ft.AMSL)	DTW (ft.BTOC)	DTW (ft.AMSL)	DTW (ft.BTOC)	DTW (ft.AMSL)
					JANUARY 2021		SEPTEMBER 2021		Pre-Design Data	
BCP SITE	MW-BCP-01A	1055371.76	1087813.27	606.17	5.14	601.03	5.61	600.56	0	606.17
	MW-BCP-01B	1055367.41	1087812.78	606.01	5.09	600.92	6.02	599.99	0	606.01
	MW-BCP-01C	1055363.11	1087812.34	606.26	24.28	581.98	24.11	582.15	0	606.26
	MW-BCP-01D	1055378.66	1087815.75	605.60	NI	NI	39.3	566.30	0	605.597
	MW-BCP-02A	1055471.63	1087466.57	608.66	7.61	601.05	7.58	601.08	0	608.66
	MW-BCP-02B	1055472.8	1087462.56	608.70	9.18	599.52	9.1	599.60	0	608.7
	MW-BCP-03A	1055322.49	1087135.58	604.80	4.74	600.06	4.73	600.07	0	604.8
	MW-BCP-03B	1055317.58	1087135.68	604.89	9.7	595.19	10.03	594.86	0	604.89
	MW-BCP-03C	1055312.9	1087135.73	604.83	29.5	575.33	30.33	574.50	0	604.83
	MW-BCP-03D	1055330.76	1087136.80	604.42	NI	NI	38.18	566.24	0	604.42
	MW-BCP-04A	1055563.86	1087333.41	608.71	4.43	604.28	4.41	604.3	0	608.71
	MW-BCP-04B	1055565.75	1087328.19	608.67	5.29	603.38	5.52	603.15	0	608.67
	MW-BCP-05A	1055955.7	1087591.41	608.73	4.46	604.27	4.14	604.59	0	608.73
	MW-BCP-05C	1055950.25	1087591.27	608.60	24.47	584.13	19.59	589.01	0	608.6
	MW-BCP-05D	1055944.33	1087591.09	608.1	41.37	566.73	41.57	566.53	0	608.1
	MW-BCP-06A	1056381.5	1087827.4	607.79	3.69	604.1	3.92	603.87	0	607.79
	MW-BCP-06C	1056387.88	1087827.11	607.45	20.65	586.80	20.49	586.96	0	607.45
	MW-BCP-07C	1055937.53	1087339.63	607.53	9.4	598.13	14.31	593.22	0	607.53
	MW-BCP-08A	1055994.58	1087260.29	610.39	5.2	605.19	5.31	605.08	0	610.39
	MW-BCP-08B	1055989.35	1087260.01	610.84	6.32	604.52	6.84	604.0	0	610.84
	MW-BCP-09A	1056059.8	1087434	609.88	5.41	604.47	6.28	603.6	0	609.88
	MW-BCP-09B	1056065.09	1087433.94	609.84	9.18	600.66	7.52	602.32	0	609.84
	MW-BCP-10A	1056142.28	1087586.53	608.74	4.08	604.66	3.76	604.98	0	608.74
	MW-BCP-10C	1056147.12	1087586.59	608.56	19.87	588.69	18.23	590.33	0	608.56
	MW-BCP-11A	1056459.2	1087297.63	612.37	7.01	605.36	7.2	605.17	0	612.37
	MW-BCP-11B	1056465.61	1087297.56	612.5	10.51	601.99	8.08	604.42	0	612.5
	MW-BCP-12A	1056771.77	1087471.88	608.75	3.86	604.89	4.35	604.4	0	608.75
	MW-BCP-12B	1056777.34	1087473.41	608.67	8.2	600.47	6.75	601.92	0	608.67
	MW-BCP-13A	1057383.07	1087139.91	611.67	4.82	606.85	5.52	606.15	0	611.67
	MW-BCP-13B	1057386.82	1087140.56	611.28	11.55	599.73	8.68	602.6	0	611.28
	MW-BCP-15A	1055307.64	1086755.04	604.49	5.85	598.64	8.68	595.81	0	604.49
	MW-BCP-15C	1055307.87	1086750.2	604.51	29.5	575.01	28.48	576.03	0	604.51
	MW-BCP-16A	1055451.81	1086204.34	597.17	0.9	596.27	2.11	595.06	0	597.17
	MW-BCP-16B	1055451.68	1086200.13	597.13	9.76	587.37	4.6	592.53	0	597.13
	MW-BCP-16C	1055451.88	1086195.83	597.14	26.71	570.43	26.6	570.54	0	597.14
	MW-BCP-17A	1056161.36	1086324.27	603.08	9.06	594.02	4.37	598.71	0	603.08
	MW-BCP-17B	1056162.34	1086319.17	603.13	16.06	587.07	9.32	593.81	0	603.13
	MW-BCP-18A	1056833.33	1086411.63	605.34	5.3	600.04	5.65	599.69	0	605.34
	MW-BCP-18B	1056826.68	1086409.21	604.98	13.92	591.06	7.11	597.87	0	604.98
	MW-BCP-19A	1057262.72	1086751.4	609.51	4.27	605.24	5.12	604.39	0	609.51
	MW-BCP-19B	1057247.51	1086781.99	610.2	15.85	594.35	7.63	602.57	0	610.2
	MW-BCP-20A	1056634.82	1086682.38	607.53	4.96	602.57	6.45	601.08	0	607.53
	MW-BCP-20B	1056636.43	1086677.23	607.16	15.14	592.02	7.15	600.01	0	607.16
	MW-BCP-21A	1055959.62	1087819.76	607.9	NI	NI	3.65	604.25	0	607.9
	MW-BCP-21C	1055954.45	1087820.16	607.49	NI	NI	23.08	584.41	0	607.49
	MW-BCP-21D	1055965.50	1087819.21	607.41	NI	NI	40.9	566.51	0	607.41
	MW-BCP-22A	1056964.29	1087768.44	609.64	NI	NI	4.88	604.76	0	609.64
	MW-BCP-23A	1057994.20	1087804.74	608.85	NI	NI	4.01	604.84	0	608.85
	MW-BCP-24A	1057178.46	1087117.11	611.69	NI	NI	5.45	606.24	0	611.69
	MW-BCP-24B	1057177.03	1087112.88	611.61	NI	NI	8.44	603.17	0	611.61
	MW-BCP-25A	1057100.68	1086740.71	609.69	NI	NI	5.55	604.14	0	609.69
	MW-BCP-25B	1057096.37	1086737.23	609.93	NI	NI	10.89	599.04	0	609.93
	MW-BCP-26B	1057321.76	1086578.80	605.88	NI	NI	5.01	600.87	0	605.88
	MW-BCP-27A	1058255.48	1087226.57	611.28	NI	NI	6.02	605.26	0	611.275
	Staff Gauge 1	1056166.21	1086853.59	600.79	NI	NI	2.15	602.94	0	600.79
	Staff Gauge 2	1055817.86	1086818.38	600.36	NI	NI	1.21	601.57	0	600.36
	Staff Gauge 3	1055947.18	1087002.82	600.36	NI	NI	2.11	602.47	0	600.363
	Staff Gauge 4	1055968.86	1087168.42	602.02	NI	NI	0.97	602.99	0	602.022
	Staff Gauge 5	1055560.48	1086441.23	596.24	NI	NI	1.72	597.96	0	596.239
	Staff Gauge 6	1055926.66	1086397.98	595.90	NI	NI	2.08	597.98	0	595.9
	Staff Gauge 7	1056329.56	1086415.51	597.38	NI	NI	1.23	598.61	0	597.381
	Staff Gauge 8	1056608.37	1086345.55	597.38	NI	NI	0.76	598.14	0	597.381
	Staff Gauge 9	1056954.85	1086462.01	599.51	NI	NI	0.38	599.89	0	599.511
	Collection Sump 1	1055922.79	1087503.52	608.18	NI	NI	NI	NI	0	608.18
	Collection Sump 2	1055703.87	1087470.37	608.85	NI	NI	NI	NI	0	608.85
	Collection Sump 3	1055461.01	1087470.81	609.61	NI	NI	NI	NI	0	609.61
	Collection Sump 4	1055954.1	1087757.59	608.77	NI	NI	NI	NI	0	608.77
	Collection Sump 5	1056245.02	1087695.23	609.47	NI	NI	NI	NI	0	609.47
	Piezometers								0	0
	P-BCP-01	1055986.63	1087768.71	606.26	NI	NI	NI	NI	0	606.26
	P-BCP-02	1056019.18	1087770.78	606.85	NI	NI	NI	NI	0	606.85
	P-BCP-03	1056054.85	1087760.72	607.13	NI	NI	NI	NI	0	607.13
	P-BCP-04	1056271.99	1087704.03	606.47	NI	NI	NI	NI	0	606.47
	P-BCP-05	1056313.77	1087700.15	606.17	NI	NI	NI	NI	0	606.17
	P-BCP-06	1056335.33	1087688.81	606.49	NI	NI	NI	NI	0	606.49
									0	0

Table 2-1
Groundwater Elevation Data and Monitoring Locations
Riverview Innovation Technology Campus
BCP Site No. C915353
Remedial Investigation
Groundwater Elevation Data

Site	Well ID	Easting (x)	Northing (y)	TOC (ft.AMSL)	DTW (ft.BTOC)	DTW (ft.AMSL)	DTW (ft.BTOC)	DTW (ft.AMSL)	DTW (ft.BTOC)	DTW (ft.AMSL)
					JANUARY 2021		SEPTEMBER 2021		Pre-Design Data	
SITE 108	MW-18D-05	1053110.419	1085449.637	572.37	6.70	565.67	6.36	566.01	0	572.37
	MW-18-91	1053110.061	1085438.94	573.12	7.30	565.82	7.06	566.06	0	573.12
	MW-09-2020	1054169.852	1085754.455	580.04	10.19	569.85	6.34	573.70	0	580.04
	MW-10S-2020	1053668.553	1085133.21	577.08	8.62	568.46	9.31	567.77	0	577.08
	MW-10D	1053673.288	1085127.413	577.35	11.38	565.97	11.30	566.05	0	577.35
	MW-11S-2020	1053054.823	1085136.876	572.41	4.89	567.52	4.89	567.52	0	572.41
	MW-11D	1053059.023	1085140.406	572.74	7.05	565.69	6.88	565.86	0	572.74
	MW-12S-2020	1053208.983	1084873.201	574.66	8.82	565.84	8.65	566.01	0	574.66
	MW-12D	1053208.56	1084869.151	575.22	9.43	565.79	9.23	565.99	0	575.22
	MW-13-2020	1054009.811	1085505.812	578.13	9.39	568.74	NR	NR	0	578.13
	PZ-01	1054113.549	1085200.867	582.23	10.68	571.55	NR	NR	0	582.23
	PZ-03	1053754.509	1085695.591	576.24	7.64	568.60	NR	NR	0	576.24
SITE 109	MW-01-2020	1055435.46	1086425.9	603.30	5.25	598.05	4.94	598.36	0	603.3
	MW-02-2020	1054722.661	1086360.522	590.31	7.94	582.37	8.84	581.47	0	590.31
	MW-03-2020	1054531.591	1086088.344	589.63	18.11	571.52	14.38	575.25	0	589.63
	MW-17-89	1054385.646	1086311.992	578.79	3.20	575.59	3.36	575.43	0	578.79
SITE 110	MW-04-2020	1057719.75	1087384.25	611.35	4.50	606.85	5.18	606.17	0	611.35
	MW-05-2020	1058023.23	1087469.42	610.07	4.06	606.01	6.18	603.89	0	610.07
	MW-06-2020	1058060.11	1087671.89	609.47	3.58	605.89	4.99	604.48	0	609.47
	MW-07-2020	1057776.63	1087625.38	610.66	4.12	606.54	5.13	605.53	0	610.66
	MW-08-2020	1058522.719	1087531.177	608.01	NI	NI	4.49	603.52	0	608.01
	MW-16-2020	1058159.82	1087671.886	609.242	NI	NI	4.82	604.42	0	609.242
3821 River Road	MW-01	1054763.1	1085637.7	585.60	8.41	577.19	8.58	577.02	0	585.6
	MW-02	1054664.83	1085688.53	583.76	6.24	577.52	NR	NR	0	583.76
	MW-03	1054643.48	1085727.38	582.65	5.73	576.92	NR	NR	0	582.65
	MW-04	1054677.95	1085737.83	584.04	5.98	578.06	5.72	578.32	0	584.04
	MW-05	1054850.05	1085573.26	587.00	6.93	580.07	NR	NR	0	587
	MW-06	1054709.37	1085645.34	584.87	8.76	576.11	NR	NR	0	584.87
	MW-07	1054724.96	1085610.85	586.21	9.90	576.31	NR	NR	0	586.21
	MW-08	1054803.55	1085648.47	585.85	3.68	582.17	NR	NR	0	585.85
	MW-09	1054691.81	1085615.55	585.30	7.61	577.69	NR	NR	0	585.3
	MW-10	1054750.83	1085524.96	586.67	8.66	578.01	9.67	577.00	0	586.67
	MW-11R	1054639.78	1085588.29	596.89	27.26	569.63	NR	NR	0	596.89
	MW-12R	1054562.66	1085773.59	591.33	24.17	567.16	NR	NR	0	591.33
	MW-13	1055422.1	1086188.4	598.87	6.69	592.18	NR	NR	0	598.87
	MW-14	1055960.7	1086117.1	604.16	5.36	598.80	NR	NR	0	604.16

NR = Groundwater elevation not recorded; NI = Monitoring Well not installed at time of gauging.
Coordinate data provided in New York State Plane (West Zone) - U.S. Survey Feet

Table 2-2
Groundwater Sample Location Summary
Riverview Innovation & Technology Campus, Inc.
Town of Tonawanda, New York

Plant Subsection	Plant Subsection AOI	Cell Location	Target Location	Monitoring Well Designation	Type	Rationale	Groundwater Sample Analysis					
							VOCs (8360C)	SVOCs (8270D)	Cyanide (9012D)	Metals (Total and Filtered) (6010)	Mercury (7470)	Ammonia (E350.1)
Western Perimeter	AOI 3 - Parking Lot	B-2	Downgradient Parking Lot	MW-BCP-01A	Shallow Monitoring Well	Sampling not required as this shallow zone will be removed during the remedial action.						
				MW-BCP-01B	Medium Depth Monitoring Well	Sampling to verify the groundwater quality contributing to clay moisture will not pose a concern for soils in the cover system.	1	1	1	1	1	
				MW-BCP-01C	Medium Deep Depth Monitoring Well	Sampling not required for design, no remedial action proposed for deep groundwater.						
Western Perimeter/Light Oil Area	AOI 2 - Production Area	D-9	Downgradient Light Oil	MW-BCP-02A	Shallow Monitoring Well	Downgradient Well, downgradient of Light Oil and Weak Ammonia Tanks. Area of potential impact by weak ammonia and light oil.	1	1	1		1	1
				MW-BCP-02B	Medium Depth Monitoring Well	No remedial design data required.						
Western Perimeter	AOI 3 - Parking Lot	B-15	Downgradient Parking Lot	MW-BCP-03A	Shallow Monitoring Well	Downgradient of former rail yard facilities.	1	1	1		1	1
				MW-BCP-03B	Medium Depth Monitoring Well	No remedial design data required.						
				MW-BCP-03C	Medium Deep Depth Monitoring Well	No remedial design data required.						
Light Oil Area	AOI 2 - Production Area	F-11	Downgradient Weak Ammonia and Phenol Tanks	MW-BCP-04A	Shallow Monitoring Well	Downgradient Well, downgradient of Light Oil and Weak Ammonia Tanks. Area of potential impact by weak ammonia and light oil.	1	1	1		1	1
				MW-BCP-04B	Medium Depth Monitoring Well	No remedial design data required.						
Tar Processing Area	AOI 2 - Production Area	N-6	Tar Processing	MW-BCP-05A	Shallow Monitoring Well	Significant source to groundwater IRM.	1	1	1	1	1	1
				MW-BCP-05C	Medium Deep Depth Monitoring Well	Confirm there in no Vertical Migration	1	1	1	1	1	1
				MW-BCP-05D	Deep Depth Monitoring Well	No remedial design data required.						

2/7/2023

Table 2-2
Groundwater Sample Location Summary
Riverview Innovation & Technology Campus, Inc.
Town of Tonawanda, New York

Plant Subsection	Plant Subsection AOI	Cell Location	Target Location	Monitoring Well Designation	Type	Rationale	Groundwater Sample Analysis					
							VOCs (8360C)	SVOCs (8270D)	Cyanide (9012D)	Metals (Total and Filtered) (6010)	Mercury (7470)	Ammonia (E350.1)
North Perimeter Well	AOI 1 - North Rail Corridor	U-1	North Perimeter	MW-BCP-06A	Shallow Monitoring Well	North Perimeter well willl inform if collection systems are effective.	1	1	1	1	1	1
				MW-BCP-06C	Medium Deep Depth Monitoring Well	No remedial design data required.						
Coke Management Area	AOI 2 - Production Area	N-11	Coke Yard	MW-BCP-07A	Shallow Monitoring Well	No remedial design data required.						
				MW-BCP-07C	Medium Deep Depth Monitoring Well	No remedial design data required.						
Coke Management Area	AOI 4 - Coke Yard	O-13	Coke Yard	MW-BCP-08A	Shallow Monitoring Well	No remedial design data required.						
				MW-BCP-08B	Medium Deep Depth Monitoring Well	No remedial design data required.						
Process Area	AOI 2 - Production Area	Q-9	South Process Area	MW-BCP-09A	Shallow Monitoring Well	Data to confirm limits of required collection systems.	1	1	1	1	1	1
				MW-BCP-09B	Medium Depth Monitoring Well	No remedial design data required.						
Tar Processing Area	AOI 2 - Production Area	R-6	Tar Processing	MW-BCP-10A	Shallow Monitoring Well	Significant source to groundwater IRM.	1	1	1	1	1	1
				MW-BCP-10C	Medium Deep Depth Monitoring Well	Confirm no vertical migration	1	1	1	1	1	1
Coke Yard	AOI 4 - Coke Yard	X-12	Coke Yard	MW-BCP-11A	Shallow Monitoring Well	No remedial design data required.						
				MW-BCP-11B	Medium Depth Monitoring Well	No remedial design data required.						

Table 2-2
Groundwater Sample Location Summary
Riverview Innovation & Technology Campus, Inc.
Town of Tonawanda, New York

Plant Subsection	Plant Subsection AOI	Cell Location	Target Location	Monitoring Well Designation	Type	Rationale	Groundwater Sample Analysis					
							VOCs (8360C)	SVOCs (8270D)	Cyanide (9012D)	Metals (Total and Filtered) (6010)	Mercury (7470)	Ammonia (E350.1)
Processing Area	AOI 2 - Production Area	AE-8	Boiler House Purifier Box Area	MW-BCP-12A	Shallow Monitoring Well	Potential cyanide source area, confirm collection system required.	1		1	1	1	1
				MW-BCP-12B	Medium Depth Monitoring Well	No remedial design data required.						
Coke Yard	AOI 4 - Coke Yard	AQ-16	East Coke Yard, West of Tar Seep No. 1 (On Site 110)	MW-BCP-13A	Shallow Monitoring Well	Area of groundwater impact from Tar Seep No. 1	1	1	1		1	1
				MW-BCP-13B	Medium Depth Monitoring Well	Confirm round 2 data.	1	1	1		1	1
Coke Yard	AOI 3 - Parking Lot	B-23	Downgradient Wells	MW-BCP-15A	Shallow Monitoring Well	No remedial design data required.						
				MW-BCP-15C	Medium Deep Depth Monitoring Well	No remedial design data required.						
Water Treatment Area (South)	AOI 6 - Water Treatment	E-34	Downgradient Wells	MW-BCP-16A	Shallow Monitoring Well	Confirm not a source of ammonia or mercury.	1	1	1	1	1	1
				MW-BCP-16B	Medium Depth Monitoring Well	No remedial design data required.						
				MW-BCP-16C	Medium Deep Depth Monitoring Well	No remedial design data required.						

Table 2-2
Groundwater Sample Location Summary
Riverview Innovation & Technology Campus, Inc.
Town of Tonawanda, New York

Plant Subsection	Plant Subsection AOI	Cell Location	Target Location	Monitoring Well Designation	Type	Rationale	Groundwater Sample Analysis					
							VOCs (8360C)	SVOCs (8270D)	Cyanide (9012D)	Metals (Total and Filtered) (6010)	Mercury (7470)	Ammonia (E350.1)
South Perimeter Well	AOI 7 - South Drainage	R-32	South Perimeter Wells	MW-BCP-17A	Shallow Monitoring Well	No remedial design data required.						
				MW-BCP-17B	Medium Depth Monitoring Well	No remedial design data required.						
South Perimeter Well	AOI7 - South Drainage		Soouth Perimeter, Downgradient of TP-BCP-35	MW-BCP-18B	Medium Depth Monitoring Well	No remedial design data required.						
Coal Yard	AOI 5 - Coal Yard	AN-21	South Coal Yard, West of Tar Seep No. 2	MW-BCP-19A	Shallow Monitoring Well	Area of groundwater impact from Tar Seep No. 2	1	1	1		1	1
				MW-BCP-19B	Medium Depth Monitoring Well	Confirm round 2 data.	1	1	1		1	1
Mixing Pad	AOI 5 - Coal Yard	AB-24	Downgradient of Mixing Pad	MW-BCP-20A	Shallow Monitoring Well	No remedial design data required.						
				MW-BCP-20B	Medium Depth Monitoring Well	No remedial design data required.						
North Property Boundary	AOI1 - North Rail Corridor		Boundary Wells	MW-BCP-21A	Supplemental Shalllow Monitoring Well	Confirm Northern Limit of Collection Zone	1	1	1	1	1	1
				MW-BCP-21C	Supplemental Medium Deep Monitoring Well	No remedial design data required.						
				MW-BCP-21D	Supplemental Deep Monitoring Well	No remedial design data required.						
Northeast Corner	AOI1 - North Rail Corridor		Boundary Well	MW-BCP-23A	Supplemental Shallow Monitoring Well	Confirm Shallow Water Quality at Northeast Boundary	1	1	1		1	1
Coke Yard	AOI4 - Coke yard		Downgradient of MW-BCP-13	MW-BCP-24B	Supplemental Medium Depth Monitoring Well	No remedial design data required.						
Coal Yard	AOI5 - Coal Yard		Downgradient of MW-BCP-19	MW-BCP-25B	Supplemental Medium Depth Monitoring Well	No remedial design data required.						
Southeast Corner	AOI7 - South Drainage		Boundary Well	MW-BCP-27A	Supplemental Shallow Monitoring Well	Confirm Water Quality at Southeast Boundary	1	1	1		1	1
						Totals	**19**	**18**	**19**	**10**	**19**	**18**

2/7/2023

Table 2-3
Test Pits and Soil Borings
Riverview Innovation &Technology Campus, Inc.
Town of Tonawanda, New York

Plant Subsection AOI	Cell Location	Sample ID	Rationale/Specific Requirements	Test Pit Depth (Feet)	Soil Samples Formation	Sample Depth	Soil Sample Analysis VOCs	SVOCs	Cyanide	PCBs	Metals	Mercury	Ammonia	Pesticides/Herbicides	PFAS	Geotechnical Parameters
AOI 1 - North Rail Corridor		TP-BCP-53	Northeastern entrance of proposed retention pond	8	Shallow fill	0 - 1 feet	Observation Only - Quantity of Fill to be relocated.									
			Upper Clay Quality		Clay	Top of Clay	1	1	1	1	1	1		1	1	1
AOI 1 - North Rail Corridor		TP-BCP-54	Assess the soil/fill along the north property line	5	Shallow fill	0 - 1 feet	Observation Only - Quantity of Fill to be relocated.									
					Clay	Top of Clay	Observation Only - Assess Potential Clay/Fill Interface Impact									
AOI 1 - North Rail Corridor		TP-BCP-55	Assess the soils in the Northeast Corner for removal	5	Shallow fill	0 - 1 feet	Observation Only - Quantity of Fill to be relocated.									
					Clay	Top of Clay	Observation Only - Assess Potential Clay/Fill Interface Impact									
AOI 2 - Production Area		TP-BCP-56	Assess extent of impacted fill in Light Oil Area	5	Shallow fill	0 - 1 feet	Quantity of Fill to be relocated, presence and extent of NAPL									
					Clay	Top of Clay	Observation Only - Assess Potential Clay/Fill Interface Impact									
AOI 2 - Production Area		TP-BCP-57	Assess extent of impacted fill in Weak Ammonia Tank Area	5	Shallow fill	0 - 1 feet	Quantity of Fill to be relocated, presence and extent of NAPL									
					Clay	Top of Clay	Observation Only - Assess Potential Clay/Fill Interface Impact									
AOI 2 - Production Area		TP-BCP-58	Assess extent of impacted fill in Exhauster Building Area	5	Shallow fill	0 - 1 feet	Quantity of Fill to be relocated, presence and extent of NAPL									
					Clay	Top of Clay	Observation Only - Assess Potential Clay/Fill Interface Impact									
AOI 2 - Production Area		TP-BCP-59	Assess extent of impacted fill in Tar Management Area	5	Shallow fill	0 - 1 feet	Quantity of Fill to be relocated, presence and extent of NAPL									
					Clay	Top of Clay	Observation Only - Assess Potential Clay/Fill Interface Impact									
AOI 2 - Production Area		TP-BCP-60	Assess extent of impacted fill in Pump House Area		Shallow fill	0 - 1 feet	See Sampling and Analysis Work Plan, Former Pump House									
					Clay	Top of Clay										
AOI 2 - Production Area		TP-BCP-61	Assess extent of impacted fill in Compressor Building Area	5	Shallow fill	0 - 1 feet	Quantity of Fill to be relocated, presence and extent of NAPL suspected based on former tank location.									
					Clay	Top of Clay	Observation Only - Assess Potential Clay/Fill Interface Impact									

Table 2-3
Test Pits and Soil Borings
Riverview Innovation &Technology Campus, Inc.
Town of Tonawanda, New York

Plant Subsection AOI	Cell Location	Sample ID	Rationale/Specific Requirements	Test Pit Depth (Feet)	Soil Samples Formation	Sample Depth	Soil Sample Analysis VOCs	SVOCs	Cyanide	PCBs	Metals	Mercury	Ammonia	Pesticides/Herbicides	PFAS	Geotechnical Parameters
AOI 3 - Parking Lot		TP-BCP-62	Property Line west of Coke Wharf	5	Shallow fill	N/A	Observation Only - Quantity of Fill to be relocatedalong property ine									
					Clay	Top of Clay	Observation Only - Assess Potential Clay/Fill Interface Impact									
AOI 4 - Coke Yard		TP-BCP-63	Downgradient of MW-BCP-13B	30	Shallow fill	N/A	Observation Only - Quantity of Fill to be relocated									
					Clay	Screen Depth	1	1	1			1	1			
AOI 5 - Coal Yard		TP-BCP-64	Downgradient of MW-BCP-19B	20	Shallow fill	N/A	Observation Only - Quantity of Fill to be relocated									
					Clay	Screen Depth	1	1	1			1	1			
AOI 7 - South Drainage		TP-BCP-65	Southeast corner, fill removal area	5	Surface Soil	0 - 1 feet	Observation Only - Quantity of Fill to be relocated.									
					Clay	Top of Clay	Observation Only - Assess Potential Clay/Fill Interface Impact									
AOI 3 - Parking Lot		SB-BCP-01	Clay Borrow Evaluation	25	Shallow fill	N/A	Observation Only - Quantity of Fill to be relocated from borrow area									
					Clay	2-, 7-, 12- and 17-feet below top of clay	4	4		4	4			4	1	1
AOI 3 - Parking Lot		SB-BCP-02	Clay Borrow Evaluation	25	Shallow fill	N/A	Observation Only - Quantity of Fill to be relocated from borrow area									
					Clay	2-, 7-, 12- and 17-feet below top of clay	4	4		4	4			4	1	1
AOI 3 - Parking Lot		SB-BCP-03	Clay Borrow Evaluation	25	Shallow fill	N/A	Observation Only - Quantity of Fill to be relocated from borrow area									
					Clay	2-, 7-, 12- and 17-feet below top of clay	4	4		4	4			4	1	1
AOI 3 - Parking Lot		SB-BCP-04	Clay Borrow Evaluation	25	Shallow fill	N/A	Observation Only - Quantity of Fill to be relocated from borrow area									
					Clay	2-, 7-, 12- and 17-feet below top of clay	4	4		4	4			4	1	1

Table 2-3
Test Pits and Soil Borings
Riverview Innovation &Technology Campus, Inc.
Town of Tonawanda, New York

Plant Subsection AOI	Cell Location	Sample ID	Rationale/Specific Requirements	Test Pit Depth (Feet)	Soil Samples Formation	Sample Depth	Soil Sample Analysis VOCs	SVOCs	Cyanide	PCBs	Metals	Mercury	Ammonia	Pesticides/Herbicides	PFAS	Geotechnical Parameters
AOI 2 - Former Production Area		SB-BCP-05	Secondary Cooler Sump Investigation (Outside Sump)	40	Shallow fill	N/A	Observation Only - Quantity of Fill to be relocated to remove sump									
					Clay	15, and 40-ftbgs	2	2	2	2	2	2	1	0	0	0
AOI 2 - Former Production Area		SB-BCP-06	Secondary Cooler Sump Investigation (Through Gravel Fill)	40	Gravel Fill	N/A	Observation Only - Quantity of Fill to be relocated to decontaminate sump									
					Residual	Below Fill	1	1	1	1	1	1	1	0	0	0
AOI 2 - Former Production Area		SB-BCP-07	Western Sump Investigation (Residual Only)	25	Aqueous Phase	N/A	Observation Only - Volume of water to be treated, note any color or sheen									
					Clay	25-ftbgs	1	1	1	1	1	1	1	0	0	0
						Totals	**22**	**24**	**8**	**22**	**22**	**8**	**7**	**18**	**4**	**4**

Table 2-4
Media Samples (Grab)
Riverview Innovation & Technology Campus, Inc.
Town of Tonawanda, New York

Plant Subsection AOI	Cell Location	Sample ID	Rationale	Sample Type	Sample Depth	Soil Sample Analysis									
						VOCs	SVOCs	Cyanide	PCBs	Metals	Mercury	Ammonia	Pesticides/ Herbicides	Bench-Scale	TCLP (Full Suite)
AOI 2 - Production Area		SS-BCP-21	Below the Light Oil Area Slab	Shallow Fill/NAPL	1-2 Feet	1	1	1		1	1	1		2	3
AOI 2 - Production Area		SS-BCP-22	Below the Weak Ammonia Tank Slab	Shallow Fill/NAPL	1-2 Feet	1	1	1		1	1	1		2	2
AOI 2 - Production Area		SS-BCP-23	Below the Exhauster Building Slab	Shallow Fill	1-2 Feet	1	1	1		1	1	1		2	2
AOI 2 - Production Area		SS-BCP-24	Below the Tar Management Area Secondary Containment Slab	Shallow Fill/Tar	1-2 Feet	1	1	1		1	1	1		2	3
AOI 2 - Production Area		SS-BCP-25	Below the Pump House Slab	Shallow Fill	1-2 Feet	1	1	1		1	1	1		2	2
AOI 2 - Production Area	AP-8	SS-BCP-26	Iron Oxide Pile	Iron Oxide Residual	0-2 feet		1	5		1	1				
AOI 5 - Coal Yard		SS-BCP-27	East End of TP-BCP-25 Area	Viscous Tar	TBD	1	1	1		1	1	1			
AOI 5 - Coal Yard		SS-BCP-28	TP-BCP-35 Area	Blue-stained Fill	TBD		1	1		1	1	1			
					Totals	6	8	12	0	8	8	7	0	10	12

Note: Bench-scale testing will include the addition of lime kiln dust and breeze (as needed) to solidify potentiallly mobile constiuents in fill to be placed in the consolidation areas. The selected physical stable mix will be sampled for all hazardous waste characteristic parameters.

Table 2-5
Testing Summary
Riverview Innovation & Technology Campus, Inc.
BCP Site No. C915353
Pre-Design Investigations

Parameter	Method Reference (a)	Groundwater	Soils	Clay Borrow	Grab Samples/Bench-scale Testing	Concrete (If Needed)
TCL Volatile Organic Compounds	8260C	19	6	16	6	4
TCL Semi-Volatile Organic Compounds	8270D	18	8	16	8	4
Polychlorinated Biphenyls	8082A		6	16		4
Pesticides	8081B		2	16		
Herbicides	8151A		2	16		
TAL Metals	6010C	10 (Total and Filtered)	8	16	8	4
Mercury	7470A	19	8	0	8	4
Cyanide	9012D	19	8	0	12	4
Ammonia	E350.1	18	7		7	
1,4 Dioxane	8270SIM			4		
Per- and Polyfluoroalkyl Substances	1633 (Draft)			4		
Toxicity Characteristic Leaching Procedure - Full List	1311				12	4
Total Organic Carbon	9060A				8	
Field Duplicates		1 per 20 Samples Collected	1 per 20 Samples Collected	1 per 20 Samples Collected	1 per 20 Samples Collected	
MS/MSD		1 per 20 Samples Collected	1 per 20 Samples Collected	1 per 20 Samples Collected		
Trip Blanks	8260	One per Volatile Shipment	N/A	N/A		
Rinsate (Equipment) Blanks		N/A	10% of Total Sampling Program for Non-Disposable Equipment	10% of Total Sampling Program for Non-Disposable Equipment	10% of Total Sampling Program for Non-Disposable Equipment	

(a) Laboratory should utilize the most recent version of the method # shown.

2/8/2023

Table 2-6
Testing Summary
Riverview Innovation & Technology Campus, Inc.
BCP Site No. C915353
Pre-Design Investigations

	Treatment Standards - Non-wastewaters (mg/kg unless noted as mg/l TCLP)					
Parameter	**K087**	**K141**	**K142**	**K143**	**K144**	**K147**
Acenaphthylene	3.4					
Benzene	10	10	10	10	10	10
Benz(a)anthracene		3.4	3.4	3.4	3.4	3.4
Benzo(a)pyrene		3.4	3.4	3.4	3.4	3.4
Benzo(b)flouranthene		6.8	6.8	6.8	6.8	6.8
Benzo(k)flouranthene		6.8	6.8	6.8	6.8	6.8
Chrysene	3.4	3.4	3.4	3.4	3.4	3.4
Dibenz(a,h)anthracene		8.2	8.2	8.2	8.2	8.2
Fluoranthene	3.4					
Indeno(1,2,3-cd)pyrene	3.4	3.4	3.4	3.4		3.4
Naphthalene	5.6					
Phenanthrene	5.6					
Toluene	10					
Xylenes (o-, m- and p-xylene)	30					
Lead	0.75 mg/l TCLP					

2/8/2023

Figures

A

INVENTUM ENGINEERING
441 CARLISLE DRIVE
SUITE C
HERNDON, VIRGINIA 20170
(703) 722-6049
www.InventumEng.com

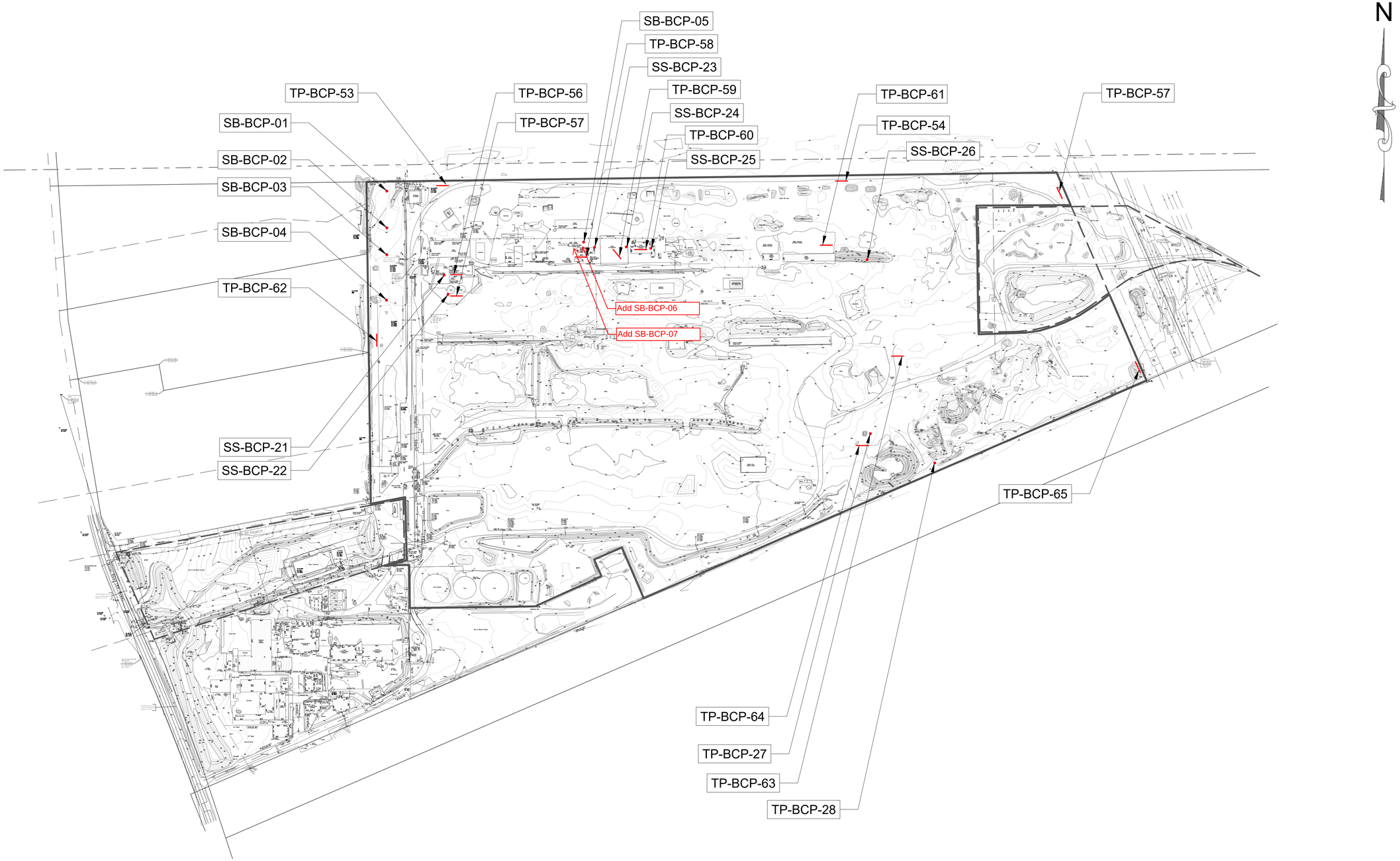
SITE LOCATION MAP

RIVERVIEW INNOVATION & TECHNOLOGY CAMPUS, INC.
3875 RIVER ROAD
TONAWANDA, NEW YORK 14150
BCP SITE No. C915353

DRAWING BY	RB
CHECKED	
APPROVED	

FIGURE 1 - 1

DRAWING NUMBER



Note:
The sample locations shown may be adjusted in the field to more completely observe and quantify site conditions.

D

1" = 200'
200' 100' 0' 200'

Reference: Niagara Boundary, Map Showing Topographic Survey of Property Owned by Riverview Innovation & Technology Campus Inc., April 2022

DRAWING BY	RB
CHECKED	
APPROVED	

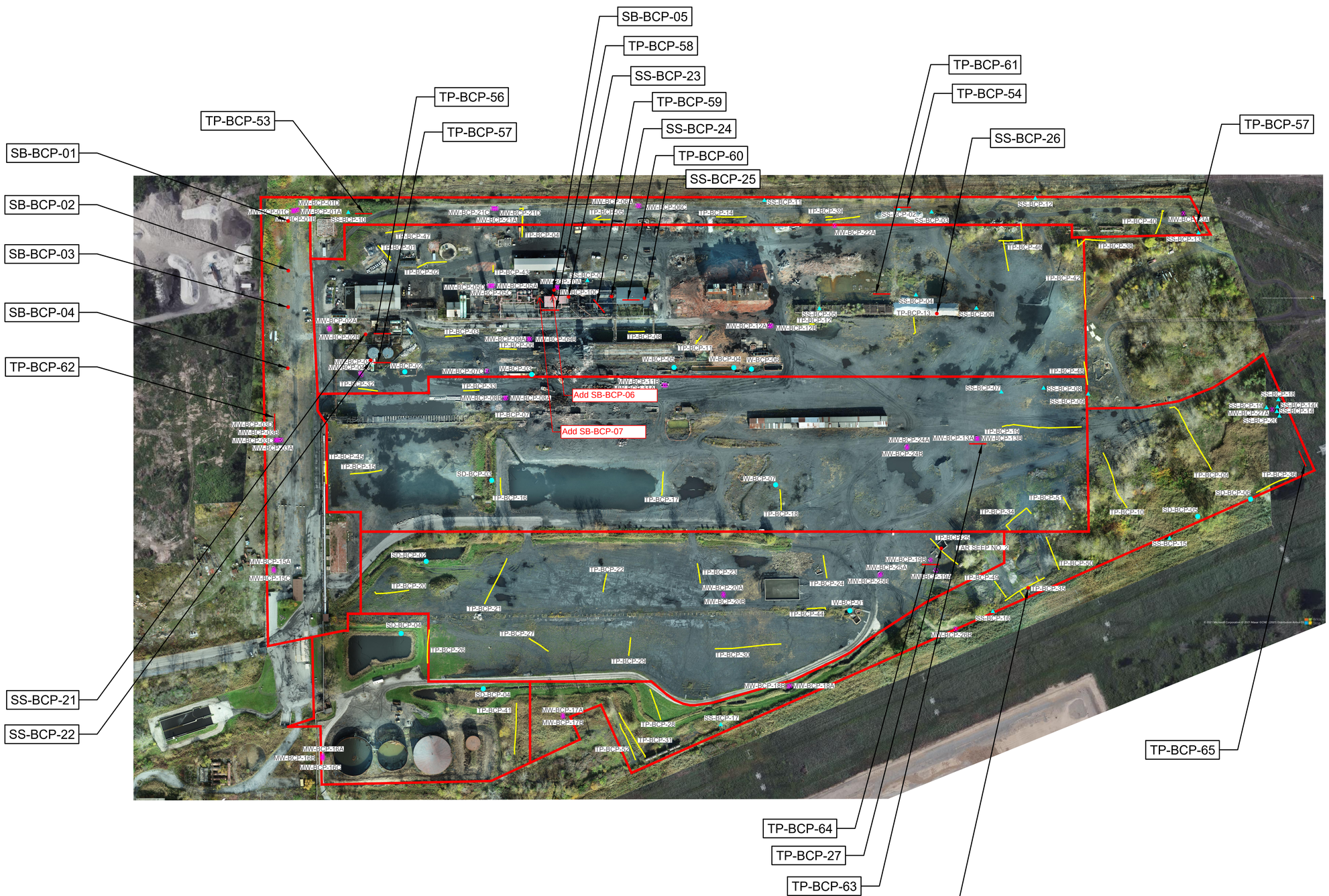
PRE-DESIGN INVESTIGATION LOCATIONS

3875 RIVER ROAD
TONAWANDA, NY 14150

INVENTUM ENGINEERING
441 CARLISLE DRIVE
SUITE C
HERNDON, VIRGINIA 20170
(703) 722-6049
www.InventumEng.com

FIGURE 6 - 1

DRAWING NUMBER



Note:
The sample locations shown may be adjusted in the field to more completely observe and quantify site conditions.

D

150 0 75 150 300 600

1 INCH =150 FEET (22X34)

DRAWING BY	RB
CHECKED	
APPROVED	

SAMPLE LOCATIONS
RIVERVIEW INNOVATION & TECHNOLOGY CAMPUS, INC.
3875 RIVER ROAD
TONAWANDA, NEW YORK 14150
BCP SITE No. C915353

INVENTUM ENGINEERING
441 CARLISLE DRIVE
SUITE C
HERNDON, VIRGINIA 20170
(703) 722-6049
www.InventumEng.com

FIGURE 6 - 2

DRAWING NUMBER

SAMPLE LOCATIONS

Appendices

Appendix A – Health and Safety Plan

Health and Safety Plan v3

Riverview Innovation & Technology Campus, Inc.

TONAWANDA COKE
Brownfield Remediation

TONAWANDA, NY

Submitted to:

Riverview Innovation & Technology Campus, Inc.
140 Lee Street.
Buffalo, NY 14210

Prepared by:

140 Lee Street
Buffalo, NY 14210

April 2021

TABLE OF CONTENTS

Authorization Signatures

This site Health and Safety Plan (HASP) has been reviewed and approved by the individuals below. The undersigned certify that to the best of their knowledge this HASP meets the safety requirements as defined by the project specifications and all known applicable governing regulatory requirements.

John Yensan, President OSC	Date
Dan Flanigan, Project Manager OSC	Date
Matt Reardon, Superintendent OSC	Date
Donald Dustin CIH, CSP, Director HS&E OSC	Date

Conformance Signatures

All Individuals working on this Project, including subcontractors must read and sign. Note: this does not apply to visitors who will not be doing work on the project.

The following personnel have read and fully understand the contents of this site Health and Safety Plan and further agree to all requirements contained herein.

Name	Affiliation	Date	Signature

Emergency Contact List

Tonawanda Coke

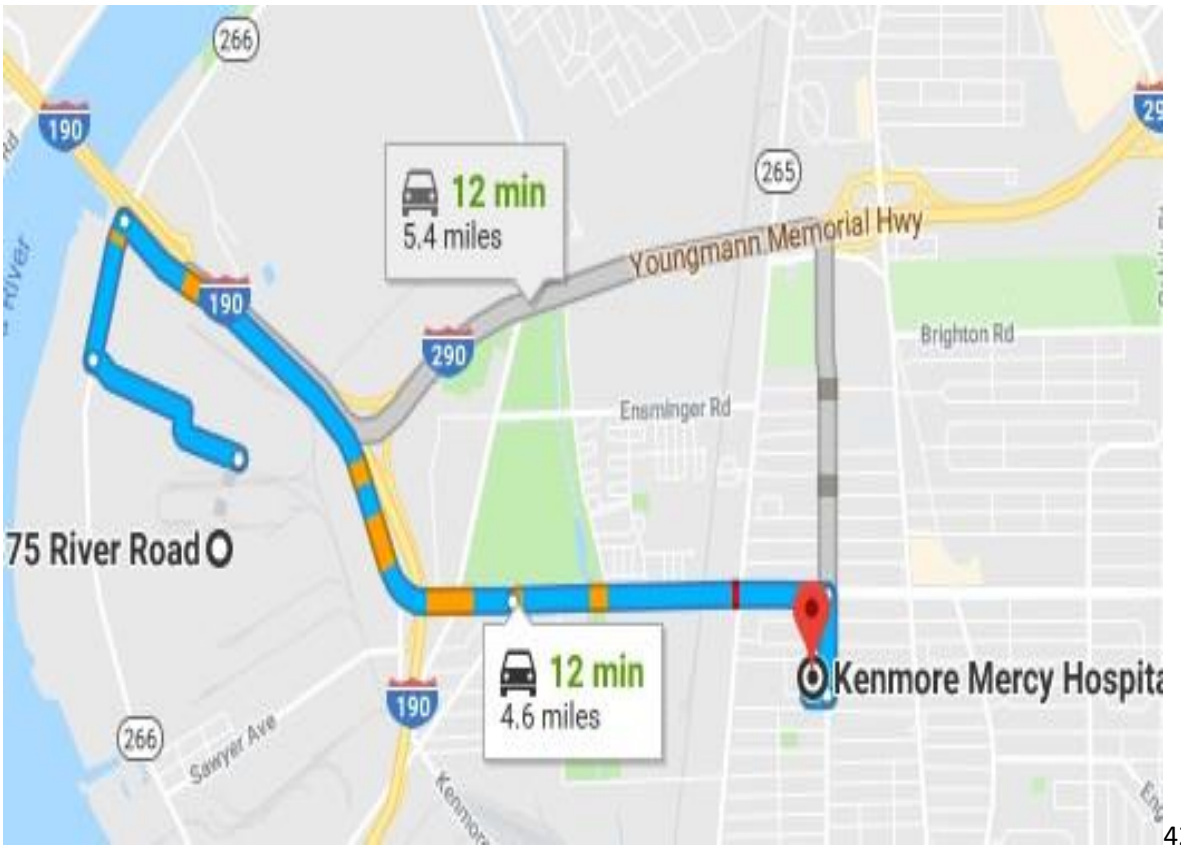
3875 River Road

Tonawanda, New York 14150

AGENCY	Contact	Phone Number
Owner's Representative	John Black Project Manager	571-217-6761
OSC	Matt Reardon Superintendent	716-570-0717
	Dan Flanigan Project Manager	716-560-3006
	John Yensan President	716-583-4400
	Donald Dustin Director HS&E	716-560-7542
Kenmore Mercy Hospital	Medical Emergency	911 (direct) 716-447-6100
Fire, Police, Ambulance	Dispatch	911
Utilities	Water Gas Electric	911

AGENCY	Contact	Phone Number
Site Emergency	Police, Fire Dept., Ambulance	911
Fire Department		911
Police Department & Security		911
Ambulance		911
Poison Control	American Association of Poison Controls	1-800-222-1222
US EPA Release Report Number	National Response Center	1-800-424-8802
HAZARDOUS MATERIALS	CHEMTREC	1-800-424-9300

LOCAL MEDICAL: KENMORE MERCY HOSPITAL, 2950 ELMWOOD AVE 14127 (DIAL 911 FOR EMERGENCY) (716) 447-6100



4217

- Turn right onto River Road
- Turn right onto Grand Island Blvd (about 2 miles)
- Merge onto Sheridan Dr.
- Go about 1.5 miles and turn right onto Elmwood Ave.
- Make a sharp right and hospital is on left

OSC Medical Consultant:

Medcor, Inc.
4805 W. Prime Parkway
McHenry, Illinois 60050
800-775-5866

Non-medical Emergency:

Wellnow Urgent Care
3450 Union Road
Cheektowaga, NY 14225
(716) 395-2043

INTRODUCTION

SITE/PROJECT BACKGROUND AND SCOPE

Riverview Innovation & Technology Campus, Inc. (Riverview) has contracted OSC, Inc. for the overall remediation of the former Tonawanda Coke Corporation (TCC) property in Tonawanda, NY. Remediation will be per requirements of the New York State Brownfield Cleanup Program (NYSBCP) and the New York State Inactive Hazardous Waste Site Program (aka State Superfund). Inventum Engineering, PC is providing technical guidance for the project.

The work includes, but is not limited, to the following:

- Mobilization
- Installation of erosion and sediment controls
- Installation of site temporary features (waste/equipment decontamination pads, temporary access roads, and temporary utilities)
- Asbestos removal on structures, building materials, fittings and debris
- Stabilization and removal of above & below ground tank contents
- Removal of hazardous process and product waste chemicals as well as universal waste
- Cleaning/decontamination of above ground structures deemed to remain on site
- Demolition of buildings, structures, and tanks not to remain on site
- Treatment/neutralization of surface soils and water as reasonably feasible per NYSBCP
- Removal of “surface tar” and other grossly contaminated soil not otherwise treated/neutralized
- Rail car cleaning and disassembly
- Tank cleaning and costing for scrap
- Dewater
- Grading
- Restoration and seed stabilization
- Demobilization

APPLICABILITY AND REFERENCES

OSC has developed the following site Health and Safety Plan (HASP) in accordance with the project contract requirements and Federal, State and Local regulations. It is intended for individuals performing work at the site and not for those considered visitors doing observation only. All operations and equipment used in conjunction with this contract shall, at a minimum, comply with the following:

- New York State Brownfield Cleanup Program
- Project Health and Safety Plan (this HASP)
- OSC Technical Work Plan
- OSHA 29 CFR 1910: Occupational Safety and Health Standards – General Industry

- OSHA 29 CFR 1926: Safety and Health Regulations for Construction
- EPA 9285.1-03: Office of Emergency and Remedial Response – Standard Operating Safety Guides
- OSC Corporate Health, Safety and Environmental Program Manual
- Orientation and Training (Supervision, Laborers, Operators & Visitors)
- Activity Hazard Analysis (AHA)
- Standard Operating Procedures; Emergency Response, Reporting, Incident Investigation, Inspections, Audits, Work Procedures, Hazard Communication, Hot Work, Confined Space, Fire Prevention, Control of Hazardous Energy (Lockout, Tagout, Tryout), Excavations, Controlled Work Zones including decontamination, Ladders, Steps, Stairs, Scaffolding Contractor/Vendor Safety Checklist, Heavy Equipment Operation, Forklift Operation, Powered Aerial Platforms
- Substance Abuse Policy
- Receive site orientation training regarding the project requirements contained in this HASP. Site orientation will be conducted by OSC's Health and Safety Officer (HSO) named in Section 2.0 of this HASP.
- Acknowledge in writing, on page 4 of this HASP titled Conformance Signatures that they have received the site-specific orientation and; therefore, have been trained in and understand the contents of this HASP and the general site safety requirements.

The health and safety protocol that is established in this HASP is based upon the known site conditions and or conditions anticipated to be present from established site data. This HASP is a living document that shall be updated and or revised over the term of this contract as warranted by change in site conditions, scope of work, methods and improvement measures. A copy of this HASP shall be maintained at the project site.

DEFINITIONS

The Owner: Riverview Innovation & Technology Campus, Inc.

The Engineer: Inventum (Owner Representative)

The Contractor: OSC – Company retained by owner to conduct the project.

The Project: Brownfield Cleanup Program, 3875 River Road, Tonawanda, NY

The Project Site: The area designated as the Contractor work area.

Contractor Work Area: An area of the Project site which includes the support zones, access roads, staging areas, contamination reduction zones and exclusion zones.

Active Full Time Project Personnel: All personnel who are permanently assigned to the project and required to perform work. Does not include visitors or vendors visiting the site temporarily who are required to be escorted always by an authorized and trained project employee.

Qualified Person: A person with a recognized degree, or professional certificate, along with extensive knowledge and experience in the subject field who can do design, analysis, evaluation and specifications.

Competent Person: A person who can identify existing any predictable hazards in their surroundings/working conditions which are unsanitary, hazardous or dangerous to employees, and who has both knowledge and authorization to take prompt corrective measures to eliminate them.

Authorized Personnel: A person that is approved or assigned by OSC to perform a specific type of duty/duties, or to be at a specific location(s) at the project site.

Stop Work Authority: HS&E personnel, qualified and competent persons, owner representatives and *all project employees* shall have the authority to stop work in any situation deemed unsafe to those working on the project site, or in any situation that poses a risk to the environment. Work will remain stopped until the involved parties correct their impact or conditions as per the requirements of this HASP.

Contamination Reduction Zone (CRZ): The CRZ is the transitional area between the identified contaminated and clean areas. The CRZ will be provided for the transfer of equipment and materials to and from the exclusion zone; the decontamination of personnel and equipment existing in the exclusion zone; and the physical segregation of the clean and contaminated work areas.

Exclusion Zone (EZ): The exclusion zone encompasses the areas of contaminates of concern (COCs); as well as any areas being utilized for the temporary storage of salvaged materials [ex. valves] and spoils to be discarded as waste. The purpose of the EZ is to limit access to only qualified and necessary personnel and manage the potential spread of COCs.

SITE VISTIOR REQUIREMENTS

A safe location, where all visitors can observe site activities of interest will be identified by the HSO. Anyone visiting the site will receive site-specific instructions from the HSO. All visitors shall be escorted by site trained personnel after signing in and completing orientation. Visitor training will include, at a minimum.

- OSC Project Safety Orientation and RIVERVIEW/Honeywell general site orientation
- Project Hazard Communication system
- Activity Hazard Analysis (AHA) review (as needed)
- Work Permit Process (as needed)
- Safety Meetings and Inspections
- PPE requirements.
- Decontamination procedures (as needed);
- Emergency procedures, and
- Any other site-specific information that the HSO deems necessary.

Any visitor wishing to enter an established contamination reduction zone (CRZ) or exclusion zone will be required to provide the HSO with documentation of medical monitoring and training equivalent to the requirements of this HASP for that area. Only authorized visitors with written proof that they have been medically certified and trained in accordance with project requirements will be permitted to enter the CRZ and/or exclusion area.

The only exception to this rule is for emergency personnel whom may enter the work area without fully complying with the requirements of this subsection. Emergency crews will be quickly briefed as to site conditions and hazards by the HSO.

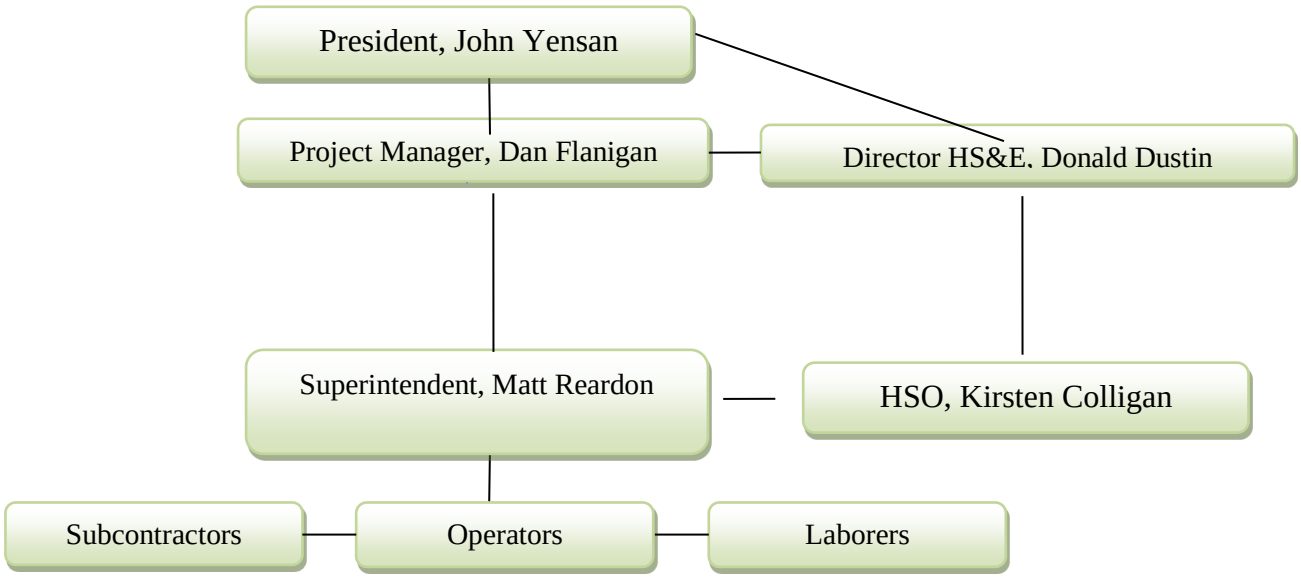
HEALTH and SAFETY ORGANIZATION

The following *OSC* management personnel will be assigned to this Project:

- President – John Yensan
- Project Manager – Dan Flanigan
- Superintendent – Matt Reardon
- On Site Health & Safety Officer – Kirsten Colligan
- Director HS&E – Donald Dustin

In addition to the above listed management, OSC will provide the appropriate number of operators and laborers, as well as the required subcontractors for this project.

ORGANIZATION CHART



PERSONNEL RESPONSIBILITIES

PROJECT MANAGERS AND SUPERINTENDENTS

The Project Manager will be responsible for the overall direction and completion of this contract. The Project Manager reports to the President and will be responsible for managing and coordinating all project related activities; as well as serving at OSC's primary contact with the Owner and/or Owner's Representative. The Site Superintendent will be responsible for overseeing contractor and subcontractor operations in the field. The Site Superintendent will report directly to the Project Manager.

Project Managers and Superintendents will be responsible for the following:

- Assure daily compliance with the Corporate HS&E Manual and this HASP during the project.
- Implement the procedures and guidelines outlined in this HASP throughout the project.
- Implement incident investigations. The Site Superintendent will notify INVENTUM management and the OSC Director HS&E immediately. Documentation will be maintained on OSC's Incident Report (see attachment I). The Incident Report will be submitted to RIVERVIEW/Honeywell by OSC. The HSO will conduct the incident investigation with support from the Superintendent and Director.
- Perform and support site safety audits and address all deficiencies.
- Provide incentive and motivation for safe work practices; as well as discipline for unsafe work practices.
- Ensuring a copy of this HASP is onsite always.
- Conduct initial site orientation meetings.

HEALTH AND SAFETY OFFICER (HSO)

The HSO will handle health and safety management on the project and will report to the Director HS&E. Specific duties of the HSO include:

- Overall implementation, enforcement and maintenance of this HASP.
- Act as a point of contact for all project site health and safety concerns.
- Conduct initial training of the contents of this HASP; as well periodic training for when rules/regulations change, new equipment or procedures are introduced, additional skills are needed, and new hazards are presented. Report observations in the daily safety meetings and update AHAs and training accordingly.
- Conduct daily meetings regarding health and safety.
- Supervising any additional HS&E requirements that are needed for this project.

The HSO will monitor the jobsite health and safety via inspection at the start and completion of each day's work; as well as monitoring the jobsite for this purpose throughout the day. The initial daily inspection will be recorded on OSC's inspection and audit form (Attachment I). Corrective actions and end-of-the-day inspection results will be recorded in the HSO's project safety logbook. Any deficiencies will be promptly corrected. All corrective and improvement measures will be

reviewed with project personnel at the morning daily safety briefing. Intentional violations of the site HS&E regulations will be grounds for disciplinary action, which could include temporary suspension or termination of personnel and/or expulsion of vendor and/or subcontractor personnel from the site.

HS&E TECHNICIANS (not anticipated for this project)

The HSO will assign qualified technicians (air monitoring, material sampling, equipment specific and job design professionals) to each work crew or task in hazardous areas as warranted.

OSC CORPORATE MEDICAL CONSULTANT AND NON-EMERGENCIES

The Medical Consultant will be available to provide call-in emergency medical consulting to OSC personnel on an around-the-clock basis. Medical emergencies occurring during normal work hours will be provided by the local hospital (see above). Non-emergency medical support and OSC's Medical Consultant are:

Medcor, Inc.
4805 W. Prime Parkway
McHenry, Illinois 60050
800-775-5866

Wellnow Urgent Care
3450 Union Rd.
Cheektowaga, NY 14225
716-395-2043

SUBCONTRACTORS

All subcontractors shall be prequalified according to the OSC subcontractor/vendor prequalification requirements including Certificates of Insurance that meet or exceed the project contract requirements (See RIVERVIEW/Honeywell Project Subcontractor Insurance Requirements Under Separate Cover).

All subcontractor employees shall be required to attend a project safety orientation prior to starting work on site (See Training and Orientation Requirements of this HASP). Subcontractors are responsible for health and safety as it pertains to their operations at the project site and shall provide the required OSC HS&E supporting documentation. Documented proof of training shall be provided for all subcontractor employees. All subcontractors are responsible for providing their employees with the proper site-specific PPE required to perform their work as well as ensure that all tools and equipment are properly inspected and maintained. Subcontractors are responsible for ensuring that their employees conform to all HS&E project requirements and applicable government regulations.

TRAINING and ORIENTATION

Personnel, including subcontractors, shall be provided with the training required to comply with this HASP. Training documentation (training certificates, attendance rosters) will be filed and maintained onsite by the HSO and will be made available for inspection upon request. Training documentation will be kept in an organized manner for each individual worker.

Full time active project personnel working onsite must have received the following.

- Required safety training as defined by OSHA CFR 1926.21 for construction
- OSHA 1926.65, Hazwoper (employees potentially exposed to hazardous chemicals)
- Medical clearance - fit for work, (includes medical surveillance for specific occupations and probable contaminants) negative drug screen, clearance for respirator use, fit test and training for the type of respirator required.

Supervisor Training – in addition to the above all designated supervisors shall have as a minimum received training that covers competent person training for the specific operation they are responsible for (i.e. excavation trenching and shoring, confined space, rigging, hot work, etc.), first aid and CPR, record keeping, incident investigation, employee substance abuse i.e., reasonable suspicion), HS&E documentation requirements.

SITE SPECIFIC TRAINING

Documentation of training, provided by a qualified safety professional, will be maintained as necessary for the following topics;

- OSC Site Specific Orientation
- Activity Hazard Analysis & Safe work procedures (AHA Review)
- Project Hazard Awareness training
- PPE requirements & possible decontamination procedures
- Heat/Cold Stress
- Fall Protection
- Heavy Equipment Operation (Authorized, Unauthorized)
- Powered Industrial Fork Truck Operation (Authorized, Unauthorized)
- Control of Hazardous Energy Lockout/Tagout and Air Gapping Requirements (1 ft visible air gap)
- Incident reporting
- Emergency response & available services (medical, fire, inclement weather, tornado, bomb threat, signals and procedures)
- Hoisting and Rigging
- Respirator use, maintenance, inspection, medical clearance and fit test
- Excavation hazards and protective measures
- Confined Space

- Dust, Erosion, and sediment control
- Noise control measures
- OSC's STAC program
- Authority to stop work (all employees) and the buddy system "No One Works Alone".

JOB SPECIFIC SPECIALIZED TRAINING & MEDICAL CLEARANCE

OSC employees will all participate in the company's annual medical surveillance program which evaluates "fit for duty" condition. These evaluations will be provided by a licensed health care professional.

Employees that may be exposed to elevated levels of contaminates (to be determined) or that wish to use tight-fitting respirators on a voluntary basis will require a current medical evaluation and be respiratory qualified in compliance with OSHA 1910.134.

MEETINGS

Attendance at all HS&E meetings will be documented and filed onsite.

- Daily Morning Safety Brief prior to the start of work "Tool Box Talk".
- Prior to the beginning of each work task, all involved workers shall be required to attend a task-specific HS&E meeting to review task-specific health and safety requirements pertinent to the tasks (AHA review - job hazards and protective measures).

Weekly HS&E Meetings

All onsite Supervisory personnel shall be required to attend a weekly meeting, conducted by the owner representative, to review project and/or task specific procedures. Topics to be discussed at these weekly meetings include, but are not limited to;

- AHA – review for all definable features of work, hazards and controls
- STAC - employee work observations and recommendations
- Audit/Inspection findings, and recommendations for improvement
- Necessary training requirements and site work rules;
- Change in work practices and/or work conditions, incident reports;
- Precautions and work practices related to scheduled site activities;
- New or modified site wide procedures or requirements;
- Discussion of potential hazards or hazardous operations;
- Procedures on restricted areas;
- Equipment rules and requirements;
- Restrictions on the handling of materials;
- PPE requirements;
- Delegation of responsibility (emergency backup personnel, competent persons, etc.);

- Review of emergency response for anticipated situations (medical, fire, inclement weather, tornado, bomb threat, environmental release/spill) and communication methods (alarms, radio, voice, and hand signals).

HS&E Audits
The OSC Director, HSE will make project site visits to assure compliance with this HASP and aid as needed. Site audits will be made minimally on a quarterly basis using the company's audit criteria (see Appendix I Forms). An audit finding report will be submitted to the project manager and superintendent within 5 days of the site visit. Highlighted deficiencies must be corrected immediately if not done so during the site visit.

SUBSTANCE ABUSE SCREENING

OSC maintains a drug free workplace. The company prohibits the use, manufacture, sale, possession, or transfer of illegal drugs, alcohol, and controlled substances on project sites.

OSC requires pre-employment, reasonable suspicion and random substance abuse testing (random testing for project-assigned personnel only as required by contractual agreement). Post injury screening may also be conducted in conjunction with reasonable suspicion. Employees as a minimum will undergo a NIDA 10 panel drug screen for illegal drugs before working on the project. Drug and alcohol screens shall be managed by OSC using laboratories certified by HHS under the National Laboratory Certification Program (NLCP).

Reasonable suspicion testing may be triggered by direct observations of employee behavior or drug-related paraphernalia. Site personnel who have been observed using alcohol or controlled substances on site or during breaks at off-site locations after which they will return to work will be requested to take an alcohol or drug test. Reasonable suspicion includes possession (on person or in vehicles) of alcohol or controlled substances on site as well as paraphernalia that suggest drug use. Site personnel who exhibit signs, symptoms, or behaviors of drug or alcohol use as interpreted by a reasonable person will also be requested to take a drug and/or alcohol test.

NOTE - Prescription drugs taken without an authorized prescription for use is considered an illegal drug. Also, in case of any injury, incident, or emergency, employees may be required to undergo a 10-panel screen for illegal drugs, alcohol (breath), or prescribed medication. Submission to substance abuse testing is a condition of employment. Failure or refusal to submit to substance abuse testing is treated the same as a positive result. All reports will be maintained at the main office. Any positive results will be referred to OSC Senior Management for further action.

PROJECT OVERVIEW AND TASK RISK ANALYSIS

TASK/RISK ANALYSIS

An Activity Hazard Analysis (AHA) shall be developed for significant features of work which break jobs down into individual tasks defining the potential hazard of that task and the proper protective and control measures that shall be taken to minimize the hazard. AHA's shall be submitted with any required daily work permit to the owner representative for their review. AHA's shall be modified as warranted by safe work observations, audit and incident investigation. Assessment of the work hazards associated with the scope of work for this project is provided in the Table 1.0 below. PPE requirements for all work shall be primarily in level D; ANSI approved hard hat, safety glasses, hearing protection with elevated noise exposures (i.e., working with power tools or near sources of loud noises), abrasion resistant gloves, safety toed boots or safety toed rubber boots (dependent on hazard exposure), high visibility traffic vest or equivalent high visibility clothing, and/or disposable coveralls (modified D). Specific information relating to the potential chemical, physical, biological and radiological hazards is provided in Table 1.1.

TABLE 1.0
OVERALL JOB HAZARD EXPOSURE (See also attachment II (AHA's))

	Potential Exposure
Mobilization and temporary facilities and controls; establishment of work zones: hazard warning signs, OSC designated work area signage including barricades and area delineation, address safe work surface needs, add lighting, traffic controls, dust, fire and erosion controls.	Low
Installation of erosion and sediment control	Moderate
Installation of site temporary features (waste/equipment decontamination pads, roads)	Moderate
Asbestos removal on structures, building materials, fittings and debris	Moderate/High
Stabilization and removal of above & below ground tank contents	Moderate/High
Removal of hazardous process and product waste chemicals & universal waste	Moderate/High
Cleaning/decontamination of of above ground structures deemed to remain on site	Moderate/High
Tank cleaning	Moderate/High
Mechanical demolition of buildings, structures, and tanks	Moderate
Energetic demolition of smokestacks	Moderate
Treatment/neutralization of surface soils and water as reasonably feasible per NYSBCP	Moderate/High
Removal of "surface tar" and other grossly contaminated soil not otherwise treated	Moderate/High
Restoration and seed stabilization	Low
Demobilization	Low

Low: Non-intrusive work – Minimal hazard/chance of exposure. Slight: Non-intrusive work / Possible HS&E hazards with tools. – Little chance of exposure. Moderate: Non-intrusive work / Possible HS&E hazards with powered tools, heavy equipment and/or working near or in water – Little chance of exposure to contaminants. Moderate/High: Intrusive work / Possible HS&E hazards with equipment – Exposure to contaminants is possible. High: Intrusive work / Possible HS&E hazards with equipment – Exposure to contaminants is probable.

CONTAMINATE/CHEMICAL HAZARDS

Existing Site Hazards

Based on information provided in the NYSBCP application and nature of the former facility (coke production and coal tar processing) there are several possible contaminates ranging from minimal to moderate hazardous exposure potential in the soil, groundwater, and surface water. Asbestos is likely to be contained in pipe/fitting/refractory insulation and other building structures.

Although several coal tar constituent chemicals of concern are volatile and semi-volatile, the product has been standing open for an extended period time. Much of the volatile and semi-volatile fraction is expected to have been released to the atmosphere minimizing the air pathway (inhalation).

Of the remaining constituent chemicals of concern, the likely exposures are skin absorption/contact and ingestion. These exposure pathways will be controlled using PPE (barrier) and proper hygiene (decontamination).

The following table, taken from the NYSPCP application and originally developed from the GHD, 2018 Remedial Investigation/Feasibility Study Work Plan, lists the chemical constituents that maybe of concern.

Sample Matrix	Sample Date	Parameter	Parameter Concentration		Industrial Standard		Data Source	Table Page Location
Surface Soil	12/21/2005	Benzo(a)pyrene	4,100	ug/kg	1,100	ug/kg		Table 1a, 2 of 70
Suburface Soil	8/24/2015	Benzo(b)fluorantene	2,000 to 4,600	ug/kg	1,100	ug/kg		Table 1b, 6 of 70
Surface Soil	8/17/2005 to 8/18/2005	Benzo(a)anthracene	13,000 to 20,000	ug/kg	11,000	ug/kg	GHD, 2018, Remedial Investigation/Feasibility Study Work Plan, Prepared for Tonawanda Coke Corporation, June.	Table 2, 11 of 70
Surface Soil	8/17/2005 to 8/18/2005	Benzo(a)pyrene	6,000 to 21,000	ug/kg	1,100	ug/kg		Table 2, 11 of 70
Surface Soil	8/17/2005 to 8/18/2005	Benzo(b)fluoranthene	13,000 to 32,000	ug/kg	11,000	ug/kg		Table 2, 11 of 70
Surface Soil	8/17/2005 to 8/18/2005	Chrysene	12,000 to 21,000	ug/kg	11,000	ug/kg		Table 2, 11 of 70
Surface Soil	8/17/2005 to 8/18/2005	Dibenz(a,h)anthracene	1,300 to 1,700	ug/kg	1,110	ug/kg		Table 2, 11 of 70
Surface Soil	8/18/2005	Indeno(1,2,3-cd)pyrene	15,000	ug/kg	11,000	ug/kg		Table 2, 11 of 70
Subsurface Soils	6/19/1989	Benzo(a)pyrene	2,400 to 11,000	ug/kg	1,100	ug/kg		Table 3, 16 of 70
Subsurface Soils	6/19/1989	Benzo(b)fluorantene	17,000	ug/kg	11,000	ug/kg		Table 3, 16 of 70
Subsurface Soils	6/19/1989	Dibenz(a,h)anthracene	2,200 to 11,000	ug/kg	1,100	ug/kg		Table 3, 16 of 70
Groundwater	10/18/1985 to 12/12/1989	Cyanide	0.22 to 2.75	mg/L	0.2	mg/L		Table 4, 37, 41, 45, 53, & 57 of 70
Groundwater	8/1/1986	1,4-Dichlorobenzene	29	ug/L	3	ug/L		Table 4, 38 of 70
Groundwater	11/1/1985 to 12/19/1989	Benzene	2.08 to 84	ug/L	1	ug/L		Table 4, 38, 42, & 54, of 70
Groundwater	8/1/1986	Chlorobenzene	22	ug/L	5	ug/L		Table 4, 38 of 70
Groundwater	11/1/1985	Xylenes	19 to 36	ug/L	5	ug/L		Table 4, 38 of 70
Groundwater	11/1/1985 to 8/1/1986	Toluene	11 to 59	ug/L	5	ug/L		Table 4, 38 of 70
Groundwater	6/26/1989 to 7/16/1991	Iron	2.597 to 160	mg/L	0.3	mg/L		Table 4, 36, 40, 48, 52, & 56 of 70
Groundwater	6/26/1989 to 7/16/1991	Manganese	0.801 to 11.2	mg/L	0.3	mg/L		Table 4, 37, 41, 49, & 57 of 70
Groundwater	11/1/1985	Phenolics	0.050 to 0.06	mg/L	0.001	mg/L		Table 4, 37 & 41 of 70
Groundwater	6/28/1989 to 12/13/1989	1,1,1-Trichloroethane	7 to 12.2	ug/L	5	ug/L		Table 4, 38 & 42 of 70
Groundwater	12/13/1989 to 12/20/1989	Methylene chloride	5.15 to 6.96	ug/L	5	ug/L		Table 4, 42 & 54 of 70
Groundwater	6/26/1989	Selenium	0.0116	mg/L	0.01	mg/L		Table 4, 49 of 70
Groundwater	6/26/1989	Nickel	0.153	mg/L	0.1	mg/L		Table 4, 53 of 70
Groundwater	7/16/1991	Cadmium	0.19	mg/L	0.005	mg/L		Table 4, 56 of 70
Surface Water	11/1/1985 to 8/1/1986	Benzene	23 to 48	ug/L	1	ug/L		Table 5, 62 of 70
Surface Water	11/1/1985	Xylenes	7	ug/L	5	ug/L		Table 5, 62 of 70
Surface Water	10/19/1989 to 7/8/1992	Toluene	12 to 24	ug/L	5	ug/L		Table 5, 62 of 70
Surface Water	3/15/1990 to 7/8/1992	Iron	1.09 to 472	mg/L	0.3	mg/L		Table 5, 62 & 64 of 70
Surface Water	3/15/1990 to 7/8/1992	Manganese	0.47 to 3.91	mg/L	0.3	mg/L		Table 5, 62, 64, & 66 of 70
Surface Water	3/15/1990	Nickel	0.14 to 0.216	mg/L	0.1	mg/L	GHD, 2018, Remedial Investigation/Feasibility Study Work Plan, Prepared for Tonawanda Coke Corporation, June.	Table 5, 62 & 64 of 70
Surface Water	11/1/1985 to 8/1/1986	Phenolics	0.039 to 0.61	mg/L	0.001	mg/L		Table 5, 63 of 70
Surface Water	12/19/1989	Methylene Chloride	52	ug/L	5	ug/L		Table 5, 66 of 70
Surface Water	3/15/1990	Chromium Total	0.086	mg/L	0.05	mg/L		Table 5, 64 of 70
Surface Water	7/8/1992	Lead	0.025	mg/L	0.025	mg/L		Table 5, 66 of 70
Sediment	3/15/1990	Benzo(a)pyrene	4,530	ug/kg	1,100	ug/kg		Table 5, 69 of 70
Sediment	3/15/1990	Dibenz(a,h)anthracene	3,430	ug/kg	1,100	ug/kg		Table 5, 69 of 70

Notes:

1 The compounds and results are representative of the site conditions at the time the samples were collected. This does not represent all samples or compounds detected, but is considered representative of the data set available for the preparation of the BCP Application.

2 Abbreviations used:

ug/kg = micrograms per kilogram
mg/L = milligrams per liter
ug/L = micrograms per liter
ug/kg = micrograms per kilogram

Chemicals Brought Onsite

The use of chemical products onsite will follow the requirements set forth in OSHA 29 CFR 1910.1200 (OSHA's Hazard Communication Standard), applicable Federal, State and Local regulations and the project procedure provided in this HASP. The potential hazards associated with these products will be mitigated through site specific training, administrative controls (e.g. labeling and storage) and use of the prescribed PPE.

Safety Data Sheets (SDS) for all chemicals brought onsite, will be available for review in OSC's field office at the project site. Chemical products shall be labeled which shall include, product name, manufacturers name, hazard warning, identifier and hazard pictogram.

The following table provides exposure guidelines for common hazardous chemicals that may be brought to the site, if required, for use during this project. The HSO will be notified before any new chemicals (chemicals not listed on the below table) are brought onsite.

HAZARD SUMMARY FOR CHEMICALS BROUGHT ONSITE					
Substance	**Route of Entry**	**Exposure Symptoms**	**Treatment**	**8 Hour TWA**	**STEL and IDLH**
Diesel Fuel	• Skin contact • Eye contact • Inhalation • Ingestion	• Harmful if comes in contact with or is absorbed throughout the skin. • Contact may cause skin and eyes irritation. • Prolonged or repeated exposure may cause liver or blood forming organ damage. • May cause skin irritation or dermatitis.	• Eyes: Irrigate immediately. • Skin: Flush with soap and water. • Inhalation: Remove victim to fresh air and provide respiratory support if needed. • Ingestion: Seek medical attention.	300 ppm	STEL: 500 ppm
Grease, Oil and Hydraulic Fluids	• Skin contact • Eye contact • Inhalation • Ingestion	• May be slightly irritating to skin and eyes. • Inhalation may cause headaches. • Ingestion could result in nausea and vomiting.	• Eyes: Irrigate immediately. • Skin: Flush with soap and water. • Inhalation: Remove victim to fresh air and provide respiratory support if needed. • Ingestion: Seek medical attention.	N/A	N/A
Gasoline Petroleum Distillates	• Skin contact • Eye contact • Inhalation • Ingestion	• Acute: Central nervous system effects. Chemical pneumonitis if aspirated into the lungs. • Chronic: Benzene is a confirmed carcinogen. Long term exposure caused kidney and liver cancer in rats/Chemical.	• Eyes: Irrigate immediately. • Skin: Flush with soap and water. • Inhalation: Remove victim to fresh air and provide respiratory support if needed. • Ingestion: Seek medical attention.	300ppm	500ppm STEL

GENERAL PHYSICAL HAZARDS AND STANDARD PROTECTIVE MEASURES

(See Attachment I, AHA for more specific detail):

Activity: *All general work activities* (manual ground laboring, operating equipment, supervising, inspecting).
Potential Hazard: noise, slips, trips and falls, struck by, pinched, falling debris, shock, heat/cold stress
Procedures to Mitigate Hazard: Minimum standard site required PPE (Level D ANSI rated hard hat, eye protection, safety boots, high visibility traffic vest or equivalent clothing, cut/abrasion resistant gloves. Hearing protection (when "you need to raise your voice to hear yourself talk") is required whenever using powered hand tools, when operating heavy equipment with no enclosed cab or near loud noise sources. Inspect work area for hazards, overhead power lines, obstructions, slip, trip, fall hazards, uneven surfaces, and vermin. Manage work area; flag, mark, delineate and cover, identify with appropriate hazard warning signs. Clearly label open pits, wells and other fall hazards (soft barricade 15 feet back, hard barricade 2 feet back). Practice extreme caution in all work areas including vegetation covered areas. Watch footing during equipment access/egress and when moving through the work area, walk with purpose, pick feet up and setup down, keep hands out of pockets, use handrails, stay on designated paths, and don't take short cuts through the site. Avoid stepping or standing on uneven or unsteady surfaces. In high heat situations stay well hydrated. Personnel will adhere to the heat and cold stress precautions provided in this HASP. All employees have stop work responsibility and authority for safety concerns.

Activity: *Manual Material Handling*
Potential Hazard: Strain, pinched, struck by, lacerations,
Procedures to Mitigate Hazard: Hands and feet clear of pinch points, standard site required PPE and gloves with hazard exposure (i.e. barrier gloves), Observe the OSC lifting program (50 lbs maximum on this project). Use good body mechanics when lifting, lift objects with your legs and not your back, keep the back straight and object lifted the power zone. Do not twist, pick your feet up and turn. Utilize equipment whenever possible - forklift, drum cart or other appropriate equipment. Seek assistance if it is needed.

Activity: *General traffic from operations* (heavy equipment, trucks, pedestrian, etc.)
Potential Hazard: Struck by, crush, fire, and burn
Procedures to Mitigate Hazard: Standard site required PPE. Traffic barricades and directional signs provide ground spotters/flagman equipment traffic, with high visibility, traffic vests or equivalent clothing. Minimum 35 ft. clearance from heavy equipment operations, leveling, compacting, separating and loading out. Develop and implement a traffic control program when site activities occur adjacent to non-OSC vehicular traffic.

Activity: *Site maintenance, materials storage and house keeping*
Potential Hazard: Slip, trip, fall, fire, burn, chemical hazards, eye, skin, struck by
Procedures to Mitigate Hazard: Personnel will properly store all equipment. Remove all scrap material from the work area and place in designated storage/lay down areas for disposal. Delineate work areas and identify with appropriate Hazard Warning Signs. Handling of materials per products SDS and developed proper storage of all flammable and combustible materials; > 20 feet from ignition sources or protected with ½ hour fire barrier (indoors). Likewise, all flammable/combustible liquid will be segregated from the ignition source >20 ft. Store all hazardous materials in approved containers. Keep all solvent wastes, oily rags and liquids in fire resistant containers. One 20 lb. ABC Extinguisher should be provided in storage areas (within 75 ft. away no closer than 20 ft.).

Activity: *Operation of hand and or power tools*
Potential Hazard: Eye, hand, face, foot injuries, electrocution, noise, fire, burn.
Procedures to Mitigate Hazard: Tool use per Mfg.'s guidelines. Inspect tools before use; verify that guards and safety devices are in place before, during and after operation. Only use a power tool that you have been trained. Use GFCI plugged in at source for all corded tools. Red tag and remove all defective tools from service. Maintain and inspect the tools per the manufacturer's recommendations. All personnel will utilize the proper eye protection and hearing protection.

Activity: *Operating Heavy Equipment* (Excavators, Compactors, Dozers, Skid Steers, Rough Terrain Fork Trucks, Powered Aerial Platforms and Trucks.
Potential Hazard: Struck by, caught between, crushed, rollover, fire, burn
Procedures to Mitigate Hazard: Equipment operation only by trained and authorized operators. Before use, any machinery or mechanized equipment will be inspected by a competent person and certified to be in safe operating condition. OSC will designate competent persons to be responsible for the inspection of machinery and equipment, daily and during use, to ensure its safe operating condition. Any machinery found to be unsafe will be dead lined; its use will be prohibited until the unsafe conditions have been corrected. Inspection of the machine/equipment will be conducted at the beginning of each shift, during which the equipment may be used, to determine that the brakes and operating systems are in proper working condition. All inspections will be documented. Only designated personnel, with appropriate training and authorization shall operate machinery and mechanized equipment. Any observed equipment deficiencies, that will affect their safe operation, will be corrected before continuing operations. A controlled work zone shall be established for demolition, sorting and loading operations. Likewise, a trained ground spotter shall be provided to assure personnel stay clear when an operator's rear view is obstructed. Dust control measures (active water misting during intrusive activities with water hose or equivalent misting equipment). Utilize the appropriate warning signs and backup alarms. All site personnel working near heavy machinery will use reflective clothing (i.e. vests) to alert operator of their whereabouts. See appropriate AHA for details (hoisting, heavy equipment operation, etc.).

Activity: *Excavating and Working in Excavations*:
Potential Hazard: Cave in, collapse, chemical exposure, struck by, entrapment
Procedures to Mitigate Hazard: Per OSHA requirements, provide protective systems of trenches when deeper than 5 feet and entry is necessary. Inspect the excavations/trenches regularly for changing conditions. Ensure that the material from the excavations/trenches is being placed away from the edge, to prevent cave-ins and pit (instability (> 2 feet back). Backfill the excavations as require by the approved contract requirements, to minimize the number of open excavations and control zones.
All excavation work shall be supervised by a competent person who will determine what protective measures are required, what those controls will be and how they will be implemented (testing, monitoring, benching, sloping, shoring, means of egress, dewatering, etc.). The competent person will inspect the excavations and controls to ensure reinforced structures are barricaded or marked, with barricade tape or traffic cones, during active excavations. If an excavation must remain open prior to backfill, those excavations must be fenced or barricaded (> 6 ft. from edge). Compliance with OSHA 29 CFR 1926 Subpart P will be maintained.
Atmosphere monitoring will be conducted prior to entry and during work activities in excavations/trenches.

Activity: *Working around or near utilities* (Utilities hazards overhead and or underground).
Potential Hazard: Stored Energy Hazards (electrical, gas, water, sewer, etc.).
Procedures to Mitigate Hazard: Request utility mark out, notify FPO utility authority a minimum of three days prior to performing any intrusive or demolition activities. Prior to work beginning, ensure that all utility lines are not energized. Stay a minimum of 10-feet away from energized lines.

Activity: *Servicing equipment*.
Potential Hazard: Uncontrolled release of hazardous energy (electrical, mechanical, kinetic, pressure, heat, chemical, any type of stored or potential energy).
Procedures to Mitigate Hazard: The lock-out/tag-out procedure provided in this HASP will be followed when working on machines and equipment in which the unexpected energizing / start-up of the machines or equipment, or release of stored energy could cause injury to employees.

Activity: *Working from elevated heights* (> 6 feet) with an open edge to the next lowest.
Potential Hazard: Fall
Procedures to Mitigate Hazard: All work form elevated heights shall be performed as supervised by a competent person. In all cases proper fall protection shall be utilize; personal fall restraint systems. Maintain 100% tie-off.

Activity: *Demolition of structures and tanks* (mechanical means and use of energetic materials).
Potential Hazard: Unintended explosion, crush, premature collapse, propelled debris, contamination spread (i.e., asbestos, silica).
Procedures to Mitigate Hazard: Only qualified, competent personnel to oversee and manage demolitions (mechanical and energetic). Third—party explosive demolition contractor to oversee and manage stack demolition and handling of explosive materials. Maintain strict control over entry/egress of well demarcated work and exclusion zones. Extended buffer zone to be established and maintained around all demolition. Remove hazardous materials (asbestos) before demolition.

BIOLOGICAL HAZARDS

Bites and Stings

Animal bites, such as from coyotes, or stings which are usually irritants that cause localized swelling, itching and minor pain and can be handled with first aid treatment. The bites of certain snakes, lizards and spider can contain sufficient poison to warrant medical attention. Diseases, that may require medical attention, can be transmitted from some animal bites. Examples are rabies (mainly from dogs, skunks, raccoons and foxes), Lyme disease (transmitted from ticks) and encephalitis (transmitted from mosquitoes).

Personnel with known allergic reactions to bee stings should carry the appropriate medication and must notify the Director HS&E and HSO of his/her condition prior to reporting for work at the site.

Ticks, Chiggers and Lyme disease

Ticks and chiggers may be present in vegetated areas during the spring, summer and fall seasons. Preventative measures include protective clothing that covers the entire body, tucking pant legs into boots or socks and tucking a long-sleeved shirt into pants; head/hair protection; and the use of insect repellant containing DEET on all exposed areas and coveralls. Project personnel should check their bodies thoroughly for ticks and should bathe soon after returning home. Remove any ticks carefully, using a gentle firm, tugging motion with fine tweezers. If site employees feel they have been bitten they should notify the HSO immediately.

Snakes

If project personnel encounter a potentially dangerous snake – stop work, remove yourself and other workers from the immediate area and notify the Superintendent. The supervisor will contact an appropriate site representative to request that the hazard be removed. Do not re-enter the work area until you have been cleared by the HSO to do so.

Toxic Plants

Poison Ivy, poison sumac and poison oak may be present during the spring, summer and fall seasons. Avoid contact with these plants. If a project worker has come in contact, the affected area should be washed thoroughly with soap and cool water. Notify the HSO immediately.

Bloodborne Pathogens

29 CFR 1910.1030 requires that all first aid responders who may come in contact with potentially infectious materials be trained and protected from exposure. Furthermore, there is a risk for any site employee to be exposed from discarded needles and/or contaminated sharps.

All employees on this project will;

- Avoid contact with any blood or potentially contaminated object;
- Use caution when picking up or moving objects (stones, brush, debris, etc.);
- Wear leather gloves and not touch suspect objects; and .

In addition to the above requirements, the following will apply;

- All personnel will be required to receive bloodborne pathogen awareness training.
- No eating, drinking, smoking, or applying lip balm will be permitted in the designated work, decontamination and first aid areas.
- All first aid kits will be equipped with the proper PPE (i.e. gloves, CPR shields and respirators).
- If a garment (gloves included) is contaminated by blood, or other potentially infectious materials, the garment(s) will be removed as soon as possible.
- After an exposure incident, a confidential medical evaluation and follow-up will be conducted and immediately available to the employee. The HSO will coordinate all medical arrangements.

Radiological Hazards

No radiological hazards are expected during this project.

SITE SECURITY

All onsite personnel and visitors will be required to sign-in and sign-out, at the guard shack and project support trailer, before entering designated work sites. OSC will maintain, onsite, all records of site access. Visitors will be required to be knowledgeable of and conform to this HASP, prior to accessing work zones. Vehicular traffic will be permitted in the designated parking area as permitted by the owner. Access to the controlled work and traffic zones is restricted to authorized vehicles only.

SITE LAYOUT

See project work plan prepared separately.

BUDDY SYSTEM

Working alone is prohibited. All field personnel will be assigned a co-worker who will watch for hazards or problems his/her co-worker might encounter. Communication between employees must be maintained always. Workers will pre-determine hand signals, or other means of emergency signals, for communication when respiratory protection or distance makes communication difficult. Visual contact must remain between the two co-workers; they must remain near each other in order to assist in case of an emergency.

SITE COMMUNICATIONS PLAN

Each work crew, operator and manager will be equipped with a two-way radio. In the event of an emergency, and two-way radio communication is not available, oral and visual safety signals have been established to protect project personnel. These signals will be presented to personnel for all phases of operation before conducting any task. These safety signals will ensure quick communication during adverse or emergency situations. Examples of established signals, and their meanings, are provided below.

Visual Signal	Indication
Hand gripping throat	Out of air; can't breathe
Wave hands over head from side to side	Attention: stand by for next signal
Swing hands from the direction of person receiving the signal to directly overhead and through a circle	Come here
Pointed finger with extended arm	Look in that direction
Grip partner's wrist with one or both hands	Leave the area immediately
Hand on top of head	Need assistance
Thumbs up	Ok, I'm alright, I understand
Thumbs down	No, negative
Audio Signal	**Indication**
Short blast of air or vehicle horn	Caution look here
Three long blasts of air or vehicle horn	Leave the area

PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE will be selected, used, maintained and stored in accordance with OSHA 29 CFR 1926 Subpart E, and applicable manufacturer recommendations. Engineering, administrative and/or work practice controls to minimize hazards will be implemented where feasible, followed by PPE.

MINIMUM LEVELS OF PROTECTION

Level D personal protective equipment that is to be worn always by project personnel at the site includes;

- ANSI approved safety glasses with side shields;
- Leather safety boots (ANSI or ASTM)
- Rubber boots w/wet hazards or disposable booties
- Hardhat (ANSI Rated)
- High visibility vest or equivalent high visibility clothing
- Appropriate clothing (long sleeve shirts and pants) and Tyvek coveralls as required
- Gloves (leather always), nitrile as required
- Hearing protection (around powered equipment or using powered hand tools)
- Tick protection when working near water or when grubbing

Modified D PPE will be used when the possibility of dermal hazardous chemical contact, but not inhalation exposure exists and includes;

- The above minimum PPE
- Mono-goggles with face shield in chemical splash situations
- Impermeable chemical barrier gloves (i.e., nitrile) if handling contaminated material
- Coated disposable coveralls (Tyvek or equivalent) if exposure to hazardous chemicals exits
- Face shield and safety glasses with work where the potential for flying debris hazards is present (i.e., chipping, grinding, steel on steel impact activities)

Level C PPE, will be used if there is the possibility of inhalation of hazardous concentrations (or unknown concentrations) of vapors or fumes at or above OSHA PELs. Level C PPE includes;

- Modified level D PPE
- Air purifying respirator (half-face)
- Appropriate filtering media (particulate, mercury, organic, or combination cartridge)

NOTE: OSC employees are given the option of using an air purifying respirator for voluntary use.

Level B is not anticipated for this project but may be made available if necessary.

Levels D and Modified Level D are the anticipated PPE during this project. These minimum levels of protection are considered preliminary and may change based upon initial exposure assessment and routine assessments as work progresses. No change to the specified level of protection will be made without the approval of the HSO and in agreement with the Director HS&E
SELECTION OF PROTECTION LEVELS

PPE will be used when project and support activities involve known, or suspected, contamination; when vapors, gases or particulates may be generated by site activities; or when direct contact with skin may occur. Respirators protect the lungs against airborne toxicants. Chemical resistant clothing protects skin from contact with harmful and absorbable chemicals.

Level D: Protection will be used when no airborne contaminant exposure is likely and job functions do not require the use of respiratory equipment or chemical resistive clothing. The equipment for this level of protection is described above and is expected to be the minimum for the project.

Level D Modified: Protection will be modified when additional contact hazards have been identified such as splash hazards and contaminated or nuisance dust. See the description above.

Level C: Protection that will be provided when airborne contaminants have been identified and which require the use of air purifying respiratory equipment to keep exposures below health-based limits. Examples of respiratory protection for this project are half or full-face air purifying respirators with appropriate cartridges (i.e. P-100 cartridges for lead particulate, Black Organic Vapor – VOC, Brown/Gold Acid Gas, etc.). Likewise, excavation work may require an approved P100/vapor combination cartridge.

Level B: Protection that will be provided when the highest level of respiratory protection is needed with partial body or skin protection. Equipment for this level of protection will include a minimum of the following:

- SCBA, PAPR or airline respirator depending on contaminate and situation
- Chemical resistant protective clothing for hazards identified.
- Hardhat or helmet for hazards identified.
- Chemical resistant gloves with liners for hazards identified.
- Chemical resistant safety shoes or boot covers for hazards identified.

Level B is not expected for this project.

HEARING PROTECTION

Project personnel will be provided hearing protection and required to use it whenever conducting tasks where exposures may exceed 90 dB as indicated in the following table;

	Sound Level at Operator		
Equipment	Average, dB	Range	TWA, dBA
Earth Moving:			
Front End Loader	88	85-91	
Back Hoe	86.5	79-89	
Bull Dozer	96	89-103	
Roller	90	79-93	
Scraper	96	84-102	
Excavator	86	83-92	89.6*
Truck	96	89-103	
Paver	101	100-102	
Power Units:			
Generators	<85		
Compressors	<85		
Impact:			
Pile Driver (diesel/pneum.)	98	82-105	
Pile Driver (gravity)	82.5	62-91	
Pneumatic Breaker	106	94-111	
Hydraulic Breaker	95.5	90-100	
Pneumatic Chipper	109		
Other Equipment			
Compactor/Vibrator	94.5	85-98	86.1
Compressed Air Blower	104		
Power Saw	88.5	78-95	
Electric Drill	102		

Noise Standards	Noise Level
OSHA (at worker's ear)	90 dB (A) TWA
Day Time Community (at property line)	65 dB (A)

*Open windows

OSC has monitored sound levels for various tasks and operations conducted during the project to both verify that the levels cited above are accurate and to serve as exposure indicators. Sound levels have been measured for each task or operation reasonably expected of having noise levels that could result in exposures above 90 dB as an 8-hr. TWA. Regardless of the results however, OSC employees will be required to use hearing protection under pre-defined conditions.

Hearing protection will be required whenever an employee is either using a powered tool or working near loud noises (excavators, sheet driving, or working in heavy equipment with windows open). Hearing protection may be obtained from the HSO. Each employee is responsible for wearing hearing protection when required. Replacements may be obtained from the HSO, if necessary. Employees are encouraged to use hearing protection voluntarily if communications are not compromised.

RESPIRATORY PROTECTION

Project personnel may be required, to use respiratory protection to reduce their exposure to airborne hazardous substances. The standard requirements that determine the selection and use of respirators depend on the hazards present. Respirators will also be made available, at the project work area, for emergencies.

Only respirators that are approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupation Safety and Health (NIOSH) are allowed. Use must follow the regulatory requirements set forth by OSHA 29 CFR 1910.134 and OSHA 29 CFR 1926.103.

OSC employees may voluntarily use a filtering facepiece in conditions when respiratory protection is not mandatory. Employees that are medically cleared to use an APR may wear any type respirator voluntarily.

Medical Clearance & Fit Testing

All personnel, which are assigned to tasks where a respirator is needed, must have prior medical clearance. Medical evaluations and fit testing are provided by OSC. Fit test records and all project personnel medical documentation will be filed and maintained onsite, by the HSO.

Medical limitations and restrictions will be strictly enforced. No employee will be permitted to use a respirator if he/she has any facial abnormality or facial hair that may affect the fit or seal of their respirator

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Training

All personnel who are required to wear a respirator will receive training (in addition to required annual training) from the HSO on the use, maintenance, proper care and inspection of their respirators. Attendance at all training will be documented. Attendance records will be maintained onsite by the HSO and will be available for inspection upon request.

Inspection

All respirators to be used at the jobsite will be inspected for damage by the employee, prior to use. After they are trained, every employee will be responsible for inspection of their own respirator. The following elements will be inspected;

- Tightness of the connections
- Face piece
- Headbands
- Inhalation valve
- Cartridge or filter fittings
- Signs of deterioration

Any malformation, distortion, missing parts, cracks, etc. in the respirator will cause the equipment to be deemed useless until a qualified technician can properly repair the respirator. If necessary, a new respirator will be issued.

Respirator Type

The type of respirator, and who is required to wear them, will be identified on a task specific level by the HSO, in consultation with the Director HS&E, based on the type of work that will be performed and the potential for exposure to airborne contaminants.

Standard Procedure for Use

All personnel will adhere to the following standard operating procedure for respirator use;

- Carefully inspect the respirator prior to entering potentially contaminated work areas
- Conduct positive and negative pressure leak tests each time the respirator is to be used
- Do not remove the respirator in contaminated work areas
- Wear a respirator with straps inside disposable garment hood (if equipped)

Cleaning and disinfecting

Any reusable respirator must be cleaned after each use. The steps required to clean a respirator after use are;

- Remove the cartridge and headbands
- Disassemble all respirator parts
- Wash all parts, except for the cartridge and headband, in a cleaner-disinfectant solution or use soap and hot water
- Rinse all parts completely in clean, warm water
- Air dry in a clean, sanitary area
- Re-assemble the respirator
- Store the cleaned respirator in a sealed bag.

Storage

Respirators will be stored in a sealed bag to protect against dust, sunlight, extreme temperature, moisture and abrasives. Inhalation holes will be covered with duct tape immediately after leaving a contaminated area. The tape will be left on until the respirator is donned for the next entry into a contaminated area. This tape will prevent any contaminants from being dislodged from the cartridge. Respirators should be stored so that the face piece and exhalation valve will rest in a normal position and function will not be impaired by the elastic setting in an abnormal position. The respirator should not be hung to store or air dried by its straps.

STANDARD OPERATING PROCEDURES (SOPs)

General

- Ensure that all safety equipment and protective clothing is kept clean and well maintained.
- Ensure that all prescription eyeglasses are safety glasses and are compatible with respirators.
- Ensure that all disposable or reusable gloves are approved by the HSO
- Respirator filters will be changed daily.
- At the end of each day, decontaminate or dispose of all PPE used onsite. The HSO is responsible for ensuring decontamination before PPE reuse.
- Project personnel will have vision or corrected vision to at least 20/40 in one eye.
- Onsite personnel that are found to be disregarding any provision of this HASP will be barred, at the request of the HSO, from this project.
- Do not reuse disposable outerwear such as coveralls, gloves and boots. Used disposable outerwear will be removed upon leaving the exclusion zone and placed inside disposable containers that are provided for this sole purpose. The containers will be stored at the project site, at the designated staging area, and OSC will arrange for the proper disposal of these materials at the completion of the project.
- When working, immediately replace protective coveralls that have become torn or badly soiled.
- Eating, drinking, smoking, chewing gum and tobacco use shall be in designated areas.
- All personnel must thoroughly wash their hands, face and forearms prior to using the facilities, eating, drinking and smoking.
- NO alcohol, drugs (without prescriptions) or firearms will be allowed onsite at any time.

All personnel who are on medication with a safety-sensitive affect will report it to the HSO, prior to work start-up, The HSO will require a letter from the individual's personal physician stating what limitations, if any; the medication may impose on the individual.

EXCAVATION SAFETY

OSC maintains strict procedure for soil excavations. The safety of all employees during these operations depends on the soil structure and stability, contamination, weather conditions, buried utilities and structures and superimposed loads.

When excavating within a wet, sandy area, or if the area has been backfilled at any time, it is likely to be very unstable. All personnel working in these conditions must be cautious and provide extra sloping, if possible. A change in weather conditions, such has heavy rain or snow, can loosen the soil and increase the risk of a collapse. If the area of excavation is prone to collapse precautions, such as covering the area, should be taken. Heavy equipment or materials should be kept as far away as possible from the excavation area because they can also increase the risk of collapse. All excavated soil should be removed from the rim of the area and contained if possible.

An excavation competent person must be on site anytime entry into an excavation is necessary. Any person entering an excavation must be trained in the hazards and safe work practices of excavations.

To eliminate the impact on buried pipelines or cables, before any excavation begins OSC personnel will notify all utility companies to locate their lines. If such a hazard exists, the lines will be carefully marked (potting, hand digging, etc.) prior to the start of the excavation activities.

When deeper than five feet, to prevent collapsing soil the excavation must be sloped, shored or somehow contained before any personnel may enter. A ladder will be provided for employees who are working in depths for more than four feet and spacing between will not exceed 25 feet. The ladder will not be removed until all employees have exited the excavation site.

All excavation sites will be inspected daily by an OSC designated competent person. All activity will cease if the competent person, site superintendent, and/or the HSO find the site hazardous. The competent person will make an inspection any time there is a change in conditions (i.e., weather, water, heavy equipment operation, etc.).

EXTERIOR PRECAUTIONS

OSC requires that all exterior structures (sidewalks, bridges, etc.) be protected and clear of excavated materials. Sidewalks will be shored to carry a load of at least 125 pounds/sf. Planks, which are being used for temporary walkways, will be laid parallel to the length of the walkway and will be fastened together. If possible, guard rails or fences will be erected to protect employees and vehicle traffic from the edge of excavation sites.

LOCKOUT/TAGOUT POLICY

For repairs or maintenance, equipment will be locked out. This procedure ensures the health and safety of all personnel by deactivating any movable, electrical or pressurized equipment. This policy applies to all machinery or equipment that can be moved either using electrical power, hydraulic power, compressed air, steam or energy stored in springs/suspension devices. Damaged tags will be placed on all movable equipment and machinery.

Only project personnel and supervisors are authorized to lockout machinery/equipment. Every employee is responsible for his/her own equipment and nobody else is permitted to remove a lock or tag except the authorized employee. Any violation of this policy is cause for strict disciplinary action.

Lockout Procedures

Lockout devices are used to prevent the accidental re-energizing of equipment.

De-energizing Circuits and Equipment: Disconnect the circuits and equipment, to be worked on, from all electrical sources and release stored energy that could accidentally re-energize equipment.

Application of Locks and Tags: Only authorized personnel are allowed to place a lock and tag on each disconnecting – means used to de-energize the circuits or equipment before the work begins. A lock prevents unauthorized personnel from re-energizing the equipment or circuits. A tag prohibits unauthorized operation of the disconnecting device.

Verification of De-energized Condition of Circuits/Equipment: Prior to work on equipment, OSC requires that a "qualified" employee verify that the equipment is de-energized and cannot be restarted. This is typically done by a visible break in the conductors (i.e. air gap) of one foot or more.

Re-energizing Circuits and Equipment: Before circuits or equipment are re-energized, the following steps must be taken in the following order:

- A "qualified" employee conducts tests and verified that all tools and devices have been removed.
- All exposed employees are warned to stay clear of the circuits and equipment.
- Authorized personnel will remove their own locks and tags.
- The HSO will conduct a visual inspection of the area to be sure all employees are clear of the circuits and equipment.

ELECTRICAL

Only qualified and authorized personnel may work on or around electrical equipment. OSC personnel are not permitted to work on energized lines or equipment. Live or hot work must be contracted to a qualified third party unless specific authorization is given by the OSC President or Director HS&E. The following shall be observed;

- The working space around all electrical equipment will be large enough to permit access to all parts of the equipment. The working space will never be used for the storage of other materials so that immediate access can be gained.
- Only NEC certified electrical tools may be used.
- A ground fault circuit interrupter (GFCI) shall be utilized with all portable electric tools; plugged in at the source and tested prior to use. All electrical equipment shall be properly grounded or guarded (double insulated tools, GFCI).
- Single phase electrical tools must be plugged into properly grounded receptacles.
- The use of extension cords is discouraged. If their use is necessary, extension cords must never be used in traffic areas where they may be a hazard, or where they may become unplugged. Extension cords will always be grounded.
- Any energized electrical equipment, operating at 50 volts or higher, must be protected by a cabinet or other approved enclosure with warning signs that are immediately visible.

FALL PROTECTION

All work form elevated heights > 6 ft. with an open edge to the next lowest level shall be performed as supervised by a competent person. In all cases proper fall protection systems shall be utilized as determined by the competent person for fall protection; restraint systems (PFRS, guard rails, and warning lines (restricted for unprotected edge work where traditional systems are not practical).

Whenever possible, fall restraint shall be used over fall arrest. OSC observes a policy of 100% tie-off at all times.

INCIDENT PREVENTION PROCEDURES

SAFETY TASK ANALYSIS CARD

The Safety Task Analysis Card (STAC) process is a required component of all OSC projects. The STAC is a pre-printed, bi-fold card that must be completed by each employee at least once per week. The card is used by the employee as a reference tool throughout their work shift. STAC card observations are used to address new work tasks and/or potential hazards.

STAC's are used in addition to safe work permits and/or approved work procedures. The STAC is designed to be an ongoing learning tool. By breaking jobs into small parts, workers can identify hazards and eliminate or control them. It is intended as a tool to help employees make observations and correct fellow employee at risk behaviors.

The STAC must be completed by each employee at least once per week. This is the minimum requirement. Project personnel found participating in or observing risky actions without submitting a properly completed STAC will be re-trained on the need to do so.

Project supervisors and/or the HSO will review submitted STACs with employees during tailgate safety meetings and identify corrective actions.

FIRE PREVENTION AND PROTECTION

Emergency response and contingency procedures provided this HASP will be in effect throughout all phases of work. Included are firefighting equipment, alarm systems, the location of the closest fire departments and procedures for handling fire emergencies. Firefighting equipment will be inspected on a regular basis, maintained in proper working condition and will be in an accessible place, at the site, at all times.

All heavy equipment will be equipped with a fire extinguisher.

Fire extinguishers will be immediately available when working with or near combustible or flammable items.

A fire extinguisher, rated 2A or greater, will be provided for every 3,000 sf of protected building area, or major fraction thereof, on every floor and they will be placed no more than 100 feet from any point within the building. Fire extinguishers will be placed adjacent to stairways in multi-story buildings. This condition is not expected on the project.

SITE HOUSEKEEPING

The following housekeeping guidelines apply at this site:

- All excess material and debris will be kept clear from all working areas.
- Combustible materials will be removed at regular intervals and all wastes will be properly disposed of at frequent intervals.
- Containers will be provided for the collection and separation of all discarded materials and refuse. Covers and identification will be provided for all containers used for flammable or harmful substances.

MECHANICAL EQUIPMENT

The following guidelines apply when dealing with the inspection and operation of all mechanical equipment;

- All vehicles and equipment, used on the site, must be checked at the beginning of each shift to assure that all parts that affect safe operation are in proper working condition and are free from defects. An inspection form must be completed and filed with the HSO.
- Personnel will not be permitted to operate equipment when there is an obstructed view to the rear or sides, unless there is a spotter.
- Employees will not work or walk under or between any equipment that had parts which are suspended or held aloft unless/until the parts are substantially blocked to prevent falling and shifting.
- Hydraulic leaks must be addressed immediately by stopping the equipment, preventing further leaking and cleaning any hydraulic fluid spills/leaks. Notify the HSO immediately for proper corrective actions to be determined.

HIGH PRESSURE WASHERS

OSC requires that only trained and authorized personnel operate high pressure washers. This policy is intended to protect both *OSC* employees as well as any property where the equipment will be used. The following guidelines apply:

- The lance must always be pointed at the specific work area.
- Personnel will remain at least 25 feet away from the washer; and the item being washed.
- Care should be taken to ensure the proper footing of the operator.
- The operator will wear the following personal protective equipment: Hard hat with face shield, goggles, safety boots with metal foot and shin guards, hearing protection, PVC rain or chemical resistant suit and heavy gloves; as well as any additional equipment to protect against chemicals, as needed.
- OSC requires that all operators be trained in the emergency shutdown procedures and general equipment maintenance of high-pressure washers.
- Under no circumstances will an operator be allowed to make modifications to a power washer while on a job.

VEHICLE AND EQUIPMENT SAFETY

Only trained and qualified personnel may operate equipment and vehicles. This policy is intended to protect all employees and client properties. The guidelines for this policy are as follows;

- Each unit is to be inspected prior to its use on site and then inspected periodically depending on the equipment involved and the manufacturer's specifications.
- No repair work, or refueling, will be done while the vehicles or equipment are in operation. The engine is to be turned off and all buckets, blades, gates or booms must be lowered to the ground, or a substantial support.
- Equipment backup alarms must be operational and audible over the surrounding noise levels. If this is not the case, an assistant must be assigned to the operator and he/she will be required to clear the way.
- Only authorized personnel are permitted to ride in company vehicles and equipment.
- Under no circumstances will an employee be permitted to get on or off a moving vehicle.
- Operators must wear the following PPE: Boots/sturdy work shoes, ear protection devices when the noise level is excessive (see hearing protection section), heavy work gloves. Hardhats and safety eyewear with side shields are required whenever outside of an enclosed cab. Safety glasses and hearing protection are required when cab windows are open.
- The operator must always wear seatbelts .
- To ensure the proper visibility all windshields, side windows, mirrors and lights will be cleaned as often as necessary.

Trucks

The following guidelines apply to truck operators;

- A current driver's license must be carried always
- Drivers will check loaded material to ensure against loss or shifting during transit
- All DOT regulations will be followed
- When towing trailers, safety chains (grade 70) must be in used
- Non-OSC drivers must receive site-specific instructions upon arrival such as remaining in the truck, where to tarp loads, required PPE if allowed to exit truck, proper entry procedures, etc.

Heavy Equipment

OSC has the following requirements for operating front end loaders, excavators, dozers and tractors;

- Prior to their use onsite, the equipment's brakes, cables and hoses must be checked and in good working order.

- When the equipment is moving, all blades, buckets and bowls will be carried close to the ground but high enough to avoid any obstacles on the ground. If not in motion, they must be lowered to the ground or to a substantial support.
- No employees are permitted to ride on a boom, bucket, bowl or any other heavy equipment extension.
- All safety equipment must be properly installed, and in good working condition, before a piece of equipment will be used on this project.

SANITATION

Except for mobile crews having transportation readily available, all work sites will have toilets provided that adhere to the following requirements: One toilet for 20 or less employees; one toilet seat and one urinal per 40 employees; if there are 200+ employees, one toilet seat and one urinal per 50 workers.

Adequate washing/showering facilities will be provided on site where there are harmful substances, and they will be in close proximity to the site. An acceptable supply of potable water will be provided onsite, and it will be clearly marked as such. Portable water containers will have tightly sealed tops and a tap.

DAILY INSPECTIONS

The HSO will monitor jobsite hazard mitigation through inspections at the start and throughout each workday. Results of these daily inspections will be recorded on a daily safety log.

Any safety violations will be recorded and corrected by the Project Manager. All observed safety violations will be immediately corrected, explained to the person responsible, and reviewed at the next safety meeting. If an employee has excessive violations of the site safety rules, it will be grounds for disciplinary action which could lead to; termination of OSC personnel or expulsion if an onsite subcontractor personnel.

INCIDENT REPORTING

OSC will prepare and maintain (on site) incident reports that include corrective actions. These reports will be provided to within 48 hours of the incident and as needed. Each incident report will be reviewed by the OSC Director HS&E. Verbal notification shall be within 2 hours.

Any occupational incident, which results in the death of one or more employees will be reported to OSHA within 8 hours. The inpatient hospitalization an employee and all amputations or loss of an eye will be reported within 24 hours. All such incidences will be reported by OSC to the nearest OSHA Area Director during normal business hours or at the National Hotline (800-321-OSHA (6742).

In addition to OSC's internal reporting requirements, RIVERVIEW/Honeywell requires all incidents (adverse events) to be investigated and based on the severity, requires notification of the incident within specified timelines. Adverse events are divided into three tiers: Tier 1 events are the most significant and serious events, followed by Tier 2, which are significant events but not as serious as Tier 1 events, and Tier 3 events are essentially all other events that do not meet the criteria for Tier 1 or Tier 2 events. Tier 1 events are to be reported within 2 hours, Tier 2 events are to be reported within 24 hours, and Tier 3 events are to be reported when possible.

Adverse events include the following:

Tier 1:

- A release to air, water or soil that has an actual or potential off-site adverse environmental impact.
- One or more on-site fatalities;
- Three or more employees, contractors or visitors admitted to a hospital;
- Any off-site fatalities, injuries, or harmful exposures resulting from RIVERVIEW/Honeywell products or operations;
- Any security incident that may be immediately dangerous to life or property, including fires, explosions, bomb threats, chemical release, radiation release, release of a biological or chemical agent (aerosolized or gaseous form);
- Suspicious materials, package or letter that poses immediate risk to employees and has been;
- Government representatives alleging or suggesting criminal non-compliance of any kind;
- Receipt or notice of any regulatory agency directive or other type of injunctive device designed to curtail or restrict operations; and,
- Community injuries or diagnoses of illnesses allegedly associated with a company-related incident, event or release to air, water or soil.

Tier 2:

- Employee or contractor lost workday injuries/illnesses.
- Employee, contractor or visitor recordable injuries/illnesses (Criteria: "RIVERVIEW/Honeywell Global Recordkeeping Requirements").
- An environmental excursion that does not also trigger Tier 1 reporting.
- A release to air, water or soil that only narrowly avoided an adverse environmental impact or had the potential to be an excursion.
- Discovery of potential or actual evidence of contaminated groundwater from current or former operations that does not otherwise meet the definition of a Tier 1 Event.
- Suspicious activities in or around RIVERVIEW/Honeywell facilities or processes that may present a potential security risk.
- Allegations of previously unknown health/safety/environmental effects caused by products, processes, emissions or discharges (Reference: Risk Management and Reporting (Pstew-3)).
- Written notification from a governmental agency alleging non-compliance of any kind.

- Proposal or imposition of an HSER fine, penalty or corrective action.
- Receipt of a non-routine request for information from a governmental agency.
- A non-routine regulatory agency inspection.
- Audits (Peer review, Self-assessments, SBU, Third party findings and recommendations)
- Significant community activism or adverse media coverage not associated with an episodic event.
- A product recall imposed by a regulatory agency.
- Transportation-related event that results in Tier 2 impacts.
- Notice of an allegation from a third party or regulatory agency of environmental impacts from operations on current or formerly operated RIVERVIEW/Honeywell facilities.
- Demands, including voluntary agreements, to conduct a site investigation or remedial measures to respond to environmental impacts from operations on current or formerly operated RIVERVIEW/Honeywell facilities.

Tier 3:

The following Tier 3 events shall be entered into the event tracking system within seven (7) calendar days:

- On-site or off-site employee, contractor employee or visitor injuries/illnesses where first-aid treatment or evaluation is provided by a Medical or Para-Medical Professional.
- A regulatory agency inspection (which is not a Tier 1 or Tier 2 Event and may still be underway) with no notice of fine, penalty or corrective action.

Adverse events must be reported to the PM, the INVENTUM engineering manager, the RM, as soon as possible following the event. All Tier 1 and Tier 2 adverse events must be investigated, and a written investigation report must be prepared and submitted to the RIVERVIEW/Honeywell Event Reporting System.

MEDICAL SURVEILLANCE

MEDICAL EXAMINATIONS

OSC field personnel are provided with a thorough, initial medical examination to assess fitness for the project and to provide baseline health data for subsequent reference. Examinations are conducted by a qualified health care provider and repeated annually (unless abnormal test results, annual "questionnaire" answers or other problems dictate more frequent observation). A copy of the physician's statement certifying each employee's ability to work at task specific operations will be maintained in the project file by the HSO.

During the medical examination employees will be evaluated for their ability to wear respiratory protection. This evaluation will include, at a minimum, an examination of the cardiopulmonary system; including forced vital capacity (FVC) and forced expiratory volume C 1 second (FEV 1.0). When indicated by the physician, other tests of the respiratory and cardiovascular systems will be performed on the basis of an individual's past history, findings of the above below evaluation, and/or the type of equipment the individual may be required to use.

Following is an example of a baseline yearly medical examination:

Medical Monitoring Protocol				
Exam Components	**Baseline**	**Annual**	**Interim**	**Exit**
Vital Signs	Yes	Yes	Yes	Yes
Vision Screening (Includes Peripheral and Color)	Yes	Yes	Yes	Yes
Urine Drug Screen	Yes	Yes	As needed	As needed
DOT hearing	Yes	Yes	No	Yes
Spirometry	Yes	Yes	Yes	Yes
Chest X-Ray (asbestos work only)	Yes	3	No	3
Review of History	Yes	Yes	Yes	Yes
Physical Exam	Yes	Yes	Yes	Yes
Notes: Only do an X-ray if not done within the last 12 months Only do an X-ray if not done within the last 3 years For medical indications only				

NOTE: Any employee who develops a lost time injury or illness, during the period of this contract will be evaluated by the OSC medical consultant. The project supervisor will be provided with a written statement that indicated the employee's fitness and ability to return to work, signed by the medical consultant prior to allowing the employee to re-enter the work zone.

AIR MONITORING:

Lower Explosive Limit (LEL) monitoring will be conducted around any tank, vessel, or barrel containing coal tar prior to beginning work each day and when coal tar is being handled. Concentrations greater than 10% of the LEL will result in work stopping immediately for further evaluation. When LEL concentrations are zero, the HSO shall determine the need for additional monitoring.

Volatile Organic Compound monitoring (breathing zone) shall be performed when odors are detected. Monitoring will be conducted using a MultiRAE Lite with a 11.7 lamp. Work resulting in readings of 0.6 ppm or greater TWA after 15 minutes of measurement shall stop and the OSC Director, HSE contacted for further evaluation.

Any time a confined space or enclosed building area is entered initially the air shall be characterized using real-time monitors for oxygen content, LEL, and other potential hazards such as carbon monoxide or hydrogen sulfide exposure.

The need for additional air monitoring or exposure measurements will be determined as specific work tasks are developed. Air monitoring and sampling shall be specified in the relevant AHA as approved by the Director HS&E.

CONFINED SPACE ENTRY PROCEDURES

The following guidelines outline the minimum acceptable criteria that will be utilized by OSC and subcontractor personnel for all confined space entry operations.

All project specific confined space entries will be thoroughly reviewed by the designated HSO. Confined Space Permits shall be issued and approved in conjunction with the INVENTUM Project Manager. Personnel entering and working in confined spaces will be required to adhere to the OSHA Permit-Required Confined Space Standard 29 CFR 1926.1200 and the OSHA General Duty Clause. Affected project personnel are instructed in these OSHA regulations as part of the OSC employee training program.

The HSO will be responsible for reviewing the applicable entry protocol with the field team, prior to confined space entry.

DEFINITIONS

CONFINED SPACE: There are two types of confined spaces: permit required and non-permit required. OSHA's "PRCS Evaluation Procedures and Decision Flow Chart" will be used to evaluate the potential for permit require confined space.

PERMIT REQUIRED CONFINED SPACE (PRCS): The space contains, or has the potential to contain;

- A hazardous atmosphere. A hazardous atmosphere is defined as any space where the oxygen is below 19.5% or above 23.5%, combustible vapors are above 10% LEL, or high toxic concentrations are present which may cause death, incapacitation or an impaired ability to self-rescue.
- The space contains a material that may engulf an entrant.
- The space has an internal configuration that may trap or asphyxiate entrants.
- The space contains any other serious heal, safety or environmental hazard.

NON-PERMIT REQUIRED CONFINED SPACES: OSHA defined a non-permit required confined space as a PRCS in which all serious hazards have been eliminated. Non-permit required confined spaces will be re-evaluated by the HSO using the "PRCS Evaluation Procedure and Decision Flow Chart" (see attached) whenever they or their characteristics change in a way that could lead to reclassification as a PRCS.

PERSONNEL RESPONSIBILITIES

Entry Supervisors

OSC will designate an entry supervisor to oversee the confined space entry and ensure that personnel engaged in PRCS entry operations will comply with this procedure. Entry supervisors will:

- Verify that all tests, specified by the permit, have been conducted and that all procedure and equipment specified by the permit are in place before endorsing the permit and allowing the entry to begin.
- Terminate the entry and cancel the permit when the entry operations covered by the entry permit have been completed, or whenever a condition that is not allowed under the entry permit arises in or near the PRCS.
- Verify that rescue services are available and that the means for summoning them are operable.
- Remove all unauthorized individuals who enter, or attempt to enter, the PRCS during entry operations.
- Determine that the entry operations are consistent with the terms of the entry permit and that acceptable entry conditions are maintained.

Attendants

The entry supervisor will designate a qualified attendant for each PRCS operation. To be qualified, an attendant must know the hazards that authorized entrants may encounter during an entry (including information on the mode, signs and symptoms, and consequences of exposure) and must be aware of the behavioral symptoms of hazard exposure. Attendants will;

- Remain outside the PRCS during entry operations until relieved by another attendant.

- Warn all unauthorized entrants that they must stay clear of the PRCS, or that they must immediately exit if they have entered the PRCS.
- Inform the entry supervisor, if unauthorized personnel have entered the PRCS.
- Continuously maintain an accurate count of entrants in the PRCS and ensure that the means used to identify authorized entrants accurately identifies the entrants.
- Communicate with authorized entrants, as necessary, to monitor entrant status and to alert entrants of the need to evacuate the PRCS.
- Monitor the activities both inside and outside the PRCS.
- Immediately order evacuation of the PRCS if a prohibited condition is detected, the behavioral effects of hazard exposure in an authorized entrant are observed, or a situation outside the PRCS is found that could endanger the authorized entrants; or if the attendant cannot effectively and safely perform his/her duties and responsibilities.
- Perform non-entry rescues, as specified by the Confined Space Entry Permit; summon rescue and other emergency services as soon as it is determined that authorized entrants may need assistance to escape from PRCS hazards.

Attendants will NOT, under any circumstances;

- Monitor more than one occupied PRCS at any given time;
- Perform any duty that might interfere with their primary duty to monitor and protect the authorized entrant; or
- Enter the PRCS for rescue purposes.

Entrants

Authorized PRCS entrants will be identified on each Confined Space Entry Permit. Authorized entrants will;

- Know the hazards, including information on the mode, signs or symptoms, and consequences of exposure.
- Properly use the PPE provided for the PRCS entry.
- Communicate with the attendant, as necessary, so the attendant can monitor entrant status and alert entrants of any need to evacuate the PRCS.
- Evacuate the PRCS and alert the attendant whenever they recognize any warning signs or symptoms of exposure to a dangerous situation; or they detect a prohibited condition; or whenever the attendant or entry supervisor orders the evacuation; or when an evacuation alarm is activated.

TRAINING

All project personnel will be instructed not to enter PRCSs without the proper permit and without following the procedure and practices outline in this SOP and in the Confined Space Entry Permit. Personnel, who are required to enter a PRCS, or act as an attendant or entry supervisor, will be

trained to acquire the understanding, knowledge and skills necessary for the safe performance of their assigned responsibilities and duties.

Entrants will receive training on;

- The means and methods used to communicate with attendants; as well as the means attendants will use to notify them of emergencies.
- The operation of any specialized equipment that is expected to be used, including monitoring and rescue equipment.
- Evacuation signals and procedures; as well as the need for entrants to notify the attendant and evacuate the PRCS if they detect any dangerous conditions.

Attendants will receive training on:

- The procedures for monitoring inside and outside the PRCS and recognizing the conditions that might be hazardous to entrants;
- Procedures for communicating with entrants;
- Procedures for evacuating entrants from the PRCS and when evacuation is required;
- Procedures for controlling access to the PRCS;
- Their responsibility to remain outside the PRCS during entry, unless they are relieved by another attendant, and
- Non-entry rescue procedures.

Entry Supervisors will receive training on;

- Verifying that the Confined Space Entry Permit has been completed properly;
- Procedures for verifying that all tests specified by the Permit have been conducted;
- Requirements for verifying that all the procedures and equipment specified by the Permit are in place before allowing entry to begin;
- Procedures for determining if conditions are acceptable for entry;
- Authorizing entry operations, and
- Terminating entry.

All training will be conducted:

- Before the employee is first assigned confined space duties (initial training);
- Before a change in assigned duties;
- Whenever there is a change in permit space operations that presents a hazard about which employee has not previously been trained, and
- Whenever project management comment, involved regulatory officials, or the project engineer has reason to believe that there are inadequacies in the knowledge or use of these procedures.

When complete, training will be certified by the instructor. The certification will list the names of the personnel presenting and receiving training and the dates of training. Training certification documentation will be maintained as part of the Project file kept at the site and in the individual's personnel files in the home office.

PRCS ENTRY PROCEDURE

Atmospheric Testing

Before an employee enters any confined space, the entry supervisor will test the internal atmosphere with a calibrated, direct reading instrument to determine if acceptable entry conditions exist for the following conditions, in the given order:

	Condition	Acceptable Parameter(s)
A.	Oxygen Content	Above 19.5% and Below 23.5%
B.	Flammable Gases and Vapors	Less than 10% LEL
C.	Potential Toxic Air Contaminants	Below Action Levels for PPE

Continuous systems which cannot be isolated (i.e. sewers) or activities which generate significant airborne contaminants (i.e. welding) will be continuously monitored during entry, unless forced mechanical ventilation is used and has been shown to maintain an acceptable atmosphere.

Entry

The HSO will use the "PRCS Evaluation Procedures and Decision Flow Chart" to verify the presence of a PRCS. If it is determined that a PRCS does exist, the HSO will review the confined space entry procedures with entry personnel; post OSHA required danger signs at the entrances to the PRCS and notify Project personnel of the PRCS location(s); notify offsite emergency response services of the PRCS; and prepare a Confined Space Entry Permit.

Confined Space Permit

The entry supervisor will be responsible for completing the Confined Space Entry Permit. All items on the Permit must be completed. The entry supervisor will verify that all entry personnel are aware of the specific hazards that are associated with the PRCS; that all necessary safety equipment and materials are in place; that all emergency response procedures are in place; and that the pre-entry air monitoring results indicate acceptable entry conditions, before signing the permit.

Pre-entry Briefing

The entry supervisor will conduct a pre-entry briefing with the attendants and authorized entrants to discuss the requirements of the Permit and to ensure that all involved personnel understand their responsibilities and the specific hazards associated with the PRCS. A pre-entry briefing will be conducted, for each attendant and entrant, prior to entry and whenever new hazards are identified.

Entry Authorization

The entry supervisor will sign the Confined Space Entry Permit after the Permit has been completed, all safety equipment is in place, air monitoring results are acceptable, the pre-entry briefing has been conducted and the rescue procedures have been established. Once the permit has been signed:

- Entrants will wear all necessary safety and rescue equipment;
- The Permit will be posted at , or near, the PRCS entrance, and
- Entry procedures will begin.

Permit Exit and Cancellation

Each Entry Permit will be valid for one shift only. Expired and canceled Permits will be returned to the Site Superintendent who will file them with the Project documents. Permits will be canceled if;

- A new hazard is identified or encountered;
- An entrant is seriously injured and requires evacuation and/or rescue; or if
- A change in the scope of work required new activities which may create previously unanticipated hazards that could cause serious death or injury.

RESCUE/EMERGENCY RESPONSE

Offsite Rescue and Emergency Services

Offsite rescue and emergency service personnel will be informed by the HSO of the hazards they may confront when called to the jobsite to perform services. These services will be identifies and notified prior to any entry. Entry will not be performed if emergency rescue services are not available. The rescue/emergency service personnel will be provided access to all permit spaces from which the rescue may be necessary, so that the emergency responders can develop appropriate rescue plans and conduct rescue operations.

Non-entry Rescue

Non-entry rescues, retrieval systems or methods will be used whenever an authorized entrant enters a PRCS, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.

Each authorized entrant will use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level or above the entrant's head. Retrieval lines will be attached to a mechanical device or a fixed point outside the Permit space, in such a manner that rescues can begin as soon as the rescuer becomes aware of the necessity. The mechanical device will be ready to retrieve personnel from vertical PRCSs more than five feet deep.

DECONTAMINATION PROCEDURES

Decontamination of equipment and personnel will be performed as necessary and as defined in the project scope. All equipment and personnel will be decontaminated before leaving the property.

Personnel and equipment decontamination procedures to be employed are summarized in the following subsections.

PERSONNEL HYGENE AND DECONTAMINATION

Personnel will be made aware of any personal habit that may allow contaminants into or onto their body. All personnel will check that regularly worn PPE (i.e. hardhats and liners, eye protection, etc.) is clean and in good condition. A storage area for decontaminated PPE will be provided and used outside the contaminated zone. Any products used for personal consumption are prohibited in any work area. Break areas will be limited to specific areas where eating, drinking, smoking, etc. and the storage of these materials will be allowed.

A typical personnel decontamination sequence is presented below.

- Step 1: Scrape the gross contamination from boots and outer gloves. Wash them using soap in a water solution and rinse with water into a designated container in the contamination reduction zone.
- Step 2: Remove the tape from and around boots an outer gloves and deposit in a collection drum (if disposable) or store on a rack (if reusable). Remove the over boots and outer gloves and place in a collection drum (if disposable) or wash and place on a rack (if reusable).
- Step 3: Remove respirator cartridge and place in a collection drum.
- Step 4: Remove disposable coveralls and place in a collection drum. Remove boots and store in an appropriate location. Remove disposable inner gloves and dispose of them in a collection drum.
- Step 5: Remove hardhat and safety glasses: Decontaminate as necessary (wash with sanitizing solution [MSA sanitizing solution or equivalent], rinse with potable water and allow to dry at the end of each day).
- Step 6: Remove respirator, if used, and deposit in a plastic liner. Avoid touching face with fingers. Respirators will be washed in a sanitizing solution (MSA sanitizer or equivalent), rinsed with portable water and allowed to air dry at the end of each day.
- Step 7: Thoroughly wash and rinse any exposed skin with water and biodegradable soap using bucket 1. Rinse in bucket 2. Re-rinse in bucket 3. Shower and launder all personal clothing as soon as possible upon completing daily activities.

Personnel hygiene, hand and face washing, following decontamination will take place in the project support area.

EQUIPMENT DECONTAMINATION

The HSO will be responsible for inspecting decontaminated vehicles, equipment and material contaminated work areas, to ensure proper decontamination. The users and HSO will verify that each piece of equipment utilized in the exclusion zone has been properly decontaminated.

Decontamination personnel will be required to use Modified Level D PPE as specified in this HASP. The standard operating procedure for the use of high-pressure washers, also provided, will be strictly followed to prevent injury.

HEAVY EQUIPMENT DECONTAMINATION

As a general practice, equipment, such as excavators, bulldozers, etc. will remain within the work zone for the duration of the excavation activities. This ensures the minimization of the potential migration of contaminants outside the project limits. In addition, the sequence of excavation has been designed to avoid the movement of machinery and personnel over areas within the work zones that have been excavated.

Generally heavy equipment, and large materials used in potentially contaminated areas equipment, will be decontaminated as outlined below;

- Conduct gross removal of solids at point use.
- Degrease as necessary.
- Move to the equipment decontamination pad for decontamination via pressure washing.
- Collect and handle resultant liquids/solids.

TOOLS AND SMALL EQUIPMENT DECONTAMINATION

Tools and smaller equipment that may have come in contact with potentially contaminated materials will be decontaminated using the procedures outlined below;

- Flush and wipe components to remove debris and other gross contamination.
- Clean with potable water and non-phosphate detergent (i.e. Alconox) using a brush or high-pressure washer, as necessary, to remove particulate matter and surface films.
- Rinse thoroughly with potable water.
- Allow to air dry for as long as possible.

NON-DISPOSABLE SAMPLING EQUIPMENT

Non-disposable sampling equipment that may have come into contact with potentially contaminated materials will be decontaminated prior to collecting each sample as follows;

- Clean with potable water and non-phosphate detergent using a brush, if necessary, to remove all visible foreign matter.
- Rinse thoroughly with potable water.
- Rinse thoroughly with de-ionized water.
- Visually inspect the openings and treads for solid materials.
- Allow to air dry as long as possible on a clean polyethylene sheet or aluminum foil.

DISPOSAL OF DECONTAMINATION WASTES

All equipment and solvents used for decontamination will be decontaminated or disposed of properly. All aqueous liquids generated in the personnel and equipment decontamination process will be collected, characterized and appropriately disposed of. All disposable PPR will be containerized in drums and properly disposed of.

EMERGENCY EQUIPMENT and FIRST AID REQUIREMENTS

Emergency and first aid equipment to be maintained onsite will include the following;

- Approved, portable, emergency eye wash units in accordance with ANSI Standard Z358.1
- At least one industrial first aid kit will be provided and maintained at an easily accessible, uncontaminated location chosen by the HSO. Additional first aid kits may be provided
- First aid and CPR kit locations will be specifically marked by the HSO and stocked with adequate water and other supplies to cleanse and decontaminate burns, wounds or lesions.
- 10#A: B: C type dry chemical fire extinguishers will be provided at all project site locations where flammable materials present a fire risk. Mobile equipment will be equipped with 2-pound extinguishers.

Agencies and medical facilities that need to be contacted in the event of an onsite emergency, as well as directions to the nearest hospital, are identified at the beginning of this HASP. The tables stating the emergency contact information and hospital location will be posted in a prominent location(s) onsite.

If a site worker becomes injured or ill, Red Cross/American Heart Association recommended first aid procedures shall be followed. First aid, or other appropriate initial reactions, will be provided by the certified first aid technician that is closest to the incident.

NOTE: When protective clothing has been grossly contaminated during an incident, contaminants may be transferred to the treatment personnel or the wearer and cause injuries. Unless severe medical problems have occurred simultaneously with splashes, protective clothing should be washed off as quickly as possible and removed. If the worker can be moved, he/she will be taken to the personnel decontamination station where decontamination procedures, additional first aid or preparation for transport to the hospital will be accomplished. In the event that the victim could not be decontaminated, the rescue service provider must be notified of the situation.

If the injury to the worker is of a chemical nature, the procedures listed below are to be followed;

Eye Exposure: If contaminated solids or liquids get into the eyes, wash eyes immediately using large amounts of water while lifting the lower and upper eyelids occasionally. Wash for at least 15 minutes. Obtain medical attention.
Skin Exposure: If contaminated solids or liquids get on the skin, promptly wash the contaminated skin using soap and water. Immediately obtain medical attention.
Respiratory Exposure: Immediately move the victim to fresh air. Obtain immediate medical attention.
Ingestion Exposure: Identify what contaminant was swallowed. Follow the appropriate procedure described in the SDS and obtain medical attention as soon as possible.

NOTE: Any person who is transported to the hospital for treatment related to an exposure injury will take with them the appropriate information (i.e. SDSs) on the chemical to which he/she has been exposed. SDSs for known or suspected chemicals to exist onsite will be stored in OSC's project field office and maintained by the HSO.

MEDICAL EMERGENCY RESPONSE

REPORTING AN EMERGENCY

The HSO will immediately notify the Site Superintendent stating the points that are listed under a minor injury. However, with a major emergency the HSO must state that this is a major emergency. Concurrently the HSO must direct that 911 be called if not already done so. The Site Superintendent will react as follows:

- Call OSC's Corporate Director HS&E
- Call fire department (if necessary)
- Call police
- Call the Project Manager

PRE-PLANNING

Arrangements for emergency services will be made prior to initiating onsite operations. Emergency response procedures will be covered as part of the project training.

EMERGENCY CHAIN OF COMMAND

In the event of an emergency, personnel will immediately notify the HSO, using available communications. The HSO will assess the situation and take appropriate action which can include ceasing all work; ordering evacuation of the work zone; requesting emergency medical treatment; and/or administering first aid.

WEATHER

In the event of severe weather (lightning, high winds, etc.), the HSO will notify project personnel. As the storm approaches, all work will stop, loose object will be secured, and site personnel will take shelter at a location pre-arranged by the HSO. After the severe weather has passed, and prior to work startup, the HSO will inspect the site for hazards.

Lightning – Any visual sighting of lightning will result in stopping outside work activities. Work will not commence until 30 minutes after the last observed strike.

High Winds – Winds higher than 30 mph will cause all exterior hoisting and lifting to cease. Crane operators have the authority to stop lifts at lower wind speeds based on their discretion.

Project Tornado Shelter (not anticipated for this project) - To be determined with initial hazard exposure assessments and site mobilization. All reasonable efforts should be made to access this

location in the event of a tornado. Recognizing imminent tornado signs include seeing an unusually dark sky, possibly with some green or yellow clouds. You may hear a roaring or rumbling sound like a train, or a whistling sound like a jet. Large hail may also be falling. You may be able to see funnels, or they may be hidden by rain or hail.

Listen to the radio for tornado warnings during bad thunderstorms. If a tornado warning is issued, don't panic. Instead, listen and look. Quickly but calmly follow directions for getting to shelter. Take cover. Indoors you should go down into the basement and crouch down under the stairs, away from windows. Do not take an elevator. If you can't get to a basement, go into a closet or bathroom and pull a mattress over you or sit underneath a sturdy piece of furniture on the ground floor near the center of the building. Pull your knees up under you and protect your head with your hands. A bad place to be in a tornado is in a building with a regular freestanding roof such as a gymnasium, arena, auditorium, church or shopping mall. If you are caught in such a building, take cover under something sturdy. More than half of tornado deaths occur in mobile homes. If a tornado threatens, get out and go to a building with a good foundation, or lay down in a ditch away from vehicles and other objects.

If you are driving, get to a shelter, lie down in a ditch or seek cover up under the girders of an overpass or bridge. Stay as close to the ground as you can. Protect your head and duck flying debris. Stay away from metal and electrical equipment because lightning accompanies tornadoes.

If you have time before the tornado strikes, secure objects such as garbage cans and lawn furniture which can injure people. While most tornado damage is a result of the violent winds, most injuries and deaths actually result from flying debris.

SPILL CONTAINMENT PROCEDURES

The purpose of this section is two-fold; to prevent and control accidental discharge of polluting materials to surface soils and waterways (or groundwater); and to minimize and abate the hazards to human health and the environment from hazardous waste releases to air, soil or surface water. These procedures will be reviewed with project personnel prior to startup and thereafter as necessary during regular weekly HS&E meetings and daily briefings.

EMERGENCY NUMBERS

The names and phone numbers of emergency services and offices to be contacted in the event of a spill, or any other onsite emergency, is provided in the Contact Information portion located at the beginning of this HASP. These phone numbers will be posted by the HSO in prominent positions throughout the Project site.

DEFINITIONS

For the purposes of this plan, spoils are defined as any material that is accidentally or intentionally leaked, pumped, poured, dumped or emitted onto the ground, surface water, groundwater or air.

All spilled material will be considered hazardous; cleaned up following the established spill response procedures; and reported as required.

Spills will be categorized as: Priority 1 or Priority 2.

Priority 1 Spills: Result in a significant release of contamination into the air, or onto the ground, outside the exclusion zone.

Priority 2 Spills: Result in minor spill, less than five (5) gallons and not reportable, which can be easily cleaned up.

POTENTIAL SOURCES and PREVENTATIVE MEASURES

The contracted work has potential spill sources. These include, but are not limited to:

Potential Spill Source	Preventative Measure(S)
Transporting waste material to selected on and offsite disposal facilities	OSC will verify that all transportation vehicles used in support of this contract are equipped with the appropriate spill response equipment, and that the drivers have received the proper spill response training and maintain all their require federal and state licenses and certifications. Loads will be secured, tied down and covered, and transport vehicles will be checked prior to release from the site.
Re-fueling onsite equipment	OSC will prohibit the long term storing of diesel fuel. OSC will limit the amount of fuel kept onsite to only that required for weekly equipment usage.
General spill prevention requirements	Easily accessible spill response stations will be set up containing absorbent pillows, floor dry, shovels and brushes to be used in the event of a spill. The location will be known to all project personnel.

SPILL RESPONSE PROCEDURES

Initial Containment and Response

In the event of a spill, the following initial containment and response procedure must be implemented immediately.

- **Administer first aid to injured person(s).** Any employee that observes a spill will act immediately to remove and /or protect the injured person from a life-threatening situation. First aid and/or decontamination procedure will be implemented as appropriate.
- **Warn other persons and/or vehicles of the hazard.** Personnel will act to prevent any unsuspecting persons from coming in contact with the spilled materials by alerting nearby people and by obtaining assistance of other personnel who are familiar with spill control and clean up training.
- **Stop the spill at the source, if possible.** Without taking unnecessary risks, personnel will attempt to stop the spill at the source. This may involve activities such as up-righting a drum, closing a valve or temporarily sealing a hole with a plug. OSC personnel will not expend more than a brief effort, prior to notifying the HSO.

- Notify the HSO. Using available onsite communication systems, or other rapid communication procedures, the HSO will be notified of the spill, including information on the material spilled, quality, personnel injuries and immediate life-threatening hazards. The HSO will notify emergency contacts immediately (See Emergency Contact List).

NOTE: If a flammable liquid is involved in the spill, remove all ignition sources and monitor for explosive conditions with an LEL meter during cleanup. Also, remove any surrounding materials that might chemically react with the spill materials.

Spill Containment

The HSO will make a rapid assessment of any spill at the site; apply the appropriate HS&E considerations to the use of PPE in the spill release zone; and direct primary containment measures. Depending on the nature of the spill, primary containment measures may include, but are not limited to;

- Constructing a temporary containment berm to control the horizontal flow of the spill using absorbent pads, booms, sandbags, sand and/or other inert materials
- Placing drums under the leak to collect the spilling material before it flows onto the ground
- Digging a sump, installing a polyethylene liner and diverting the spilled material to the sump
- Transferring the material from its original container to another container

Spills that occur between the project site and the offsite disposal facility will be initially contained by the driver using on-board spill response equipment.

Spill Cleanup

The HSO and Project Manager will develop an incident-specific spill clean-up plan for Priority 1 spills that will take into consideration the associated hazards, quantity of spilled material, disposal methods and costs. The incident specific spill clean-up plan will be reviewed for acceptance by the owner representative and/or other Federal, State or Local oversight personnel. Once approved, the spill clean-up plan will be implemented under the direct supervision of the OSC site superintendent.

Generally, all visually detectable spills, leaks or releases of fuel oil will be collected and cleaned up using absorbent pads, booms, sandbags, sand and/or other inert materials as practicable using the response procedures outline below.

Spill Type	Response
Waste oil on the ground	Contain the spill and excavate the visually contaminated soils. Containerize, sample for classification purposes and dispose offsite.
Building/paved surfaces	Contain the spill. Power wash the contaminated are(s). Collect and containerize the resultant wastewater for onsite treatment.
Vehicle	Power wash the vehicle. Collect, contain and treat the resultant decontamination fluids.
Heavy Equipment hydraulic fluid leak	Stop equipment immediately. Clean up spill and/or leaking fluid. Contact HSO for repair approach.
Waste from truck spilled on roadway	Contain the spilled material. Collect, containerize and remove the spilled material. Sample for waste classification purposes. Dispose of material offsite.

Post-spill Inspection

The HSO, site superintendent and owner representative will jointly inspect the spill site to determine that the spill has been cleaned up to the satisfaction of all involved parties.

Reporting

In the event of a spill incident, the HSO will immediately contact the site superintendent and owner representative; initiate the emergency procedure steps that are provided in this HASP and complete a Spill Report for submittal to the owner representative.

OSC will be responsible for reporting any Priority 1 spills immediately following the incident. A written report will be submitted within seven days after the telephone call reporting the incident. The written report will include the item spilled, quantity, identification and manifest numbers, whether the amount spilled is EPA/State/District reportable, exact location of occurrence, containment procedures used, anticipated clean-up and disposal procedures and disposal of spill residue.

HEAT/COLD STRESS

HEAT

The HSO will visually monitor personnel for signs of heat overexposure. The HSO will be responsible for implementing the following program when the ambient air temperature exceeds 85°F (heat stress monitoring).

Symptoms

Weakness, dizziness, fainting, nausea, headaches, cool and clammy skin, profuse sweating, slurred speech, weak pulse and dilated pupils.

Procedure

Personnel who wear PPE allow their body heat to be accumulated with and elevation of the body temperature. Heat, heat exhaustion and heat stroke can be experienced which, if not remedied, can threaten health and life. A current edition of the American Red Cross Standard First Aid book or equivalent will be maintained onsite at all times so that the HSO and all personnel will be able to recognize the symptoms of heat emergency and be capable of controlling them.

When PPE is worn (especially level C) the suggested guidelines for ambient temperature and maximum wear time per excursion are as follows:

Ambient Temperature (°F)	Maximum Wear Time Per Excursion (Minutes)
Above 90	15
85 – 90	30
80 – 85	60
70 – 80	90
60 – 70	120
50 – 60	180

One method for measuring the effectiveness of employees' rest-recovery regime is by monitoring their heart as follows:

- During a 3-minute period, count the pulse rate for the last 30 seconds of the first minute, the last 30 seconds of the second minute and the last 30 seconds of the third minute.
- Double that count.
- If the recovery rate during the last 30 seconds of the first minute is at 110 beats per minute or less and the deceleration between the first, second and third minute is at least 10 beats/minute, the work recovery regime is acceptable. If the employee's rate is above the specified, longer rest period is required, and accompanied by and increased intake of fluids.

COLD

Whole body protection will be provided to personnel who will have prolonged exposure to cold air. The HSO will use the equivalent chill temperature when determining the combined cooling effect of wind and low temperatures on exposed skin or when determining the proper clothing insulation requirements. The following clothing will be used as deemed necessary, by the HSO.

Appropriate underclothing (wool or other cloth)

Outer coats that repel wind and moisture

Face, head and ear coverings

Extra pairs of socks

Insulated safety boots

Wool glove liners or wind and water repellant gloves

Personnel who are working in continuous cold weather are required to warm themselves on a regular basis in the onsite trailer. Drinks will be provided to personnel to prevent dehydration. The HSO will follow the work practices and recommendations for cold stress threshold limit values as stated by the current edition of the Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices by the American Conference of Governmental Industrial Hygienists, or equivalent cold *stress prevention* methods.

LOGS, REPORTS and RECORDKEEPING

The following reports will be prepared and submitted as indicated below. Copies of the field logs, permits and forms required for this project are provided in Attachment 1.

Type	Frequency
AHA Pre-plan for High Risk Work	Prior to start of work
Employee Daily Safety Brief Site Log	Daily, minimum
Air Monitoring Reports	As necessary
Incident Report	As required, within 48 hours

The above logs and reports will be prepared by the HSO, or the designated representative, at the frequency noted above. Additionally, daily logs of all personnel working or visiting the site will be maintained. Completed logs and reports will be maintained stored on site in the project field office. Copies shall be provided to the Project Manager.

Hot Work Permit Procedures (Welding, Cutting, Open Flame Work & Sparking)

OSC will follow specific procedures to assure all hot work activities, welding, burning, cutting, sparking and other ignition source work is completed safely without incident (no fires, injuries or property damage). All hot work shall require an approved hot work permit issued by the OSC HSO prior to commencing work. The hot work permit shall define the minimum acceptable procedures and precautions that shall be taken for all phases of the hot work; prior to start of work, as well as during and after hot work is completed. A permit shall be issued daily for each specific location, type of hot work, protective measures, date, time duration and completion time. Hot work permits will be available for review. Completed and signed permits shall be returned to the HSO at the end of the workday. Copies of completed permits shall be maintained in the OSC field office for review.

NOTE: Many of the piping, vessels and towers at the site contain flammable materials. The hot work permit procedure MUST be followed.

Authorization of Equipment Operators

All heavy equipment operators working on site will be approved competent either through OSC's in-house program or through local labor union process. Training requirements for approval are as follows;

Heavy Equipment Operators

- Formal classroom with written qualification, or
- On-the-job mentoring for 40-hour minimum under a competent person, and
- Determination of proficiency by an OSC certified supervisor

The formal classroom and mentoring may be adjusted based on an operator's previous experience. In addition, operators may need to obtain state-specific crane licenses/permits.

Crane Operators

- Formal classroom with written qualification
- Determination of proficiency by a certified operator
- On-the-job mentoring for 80-hour minimum under a competent person

The formal classroom and mentoring may be adjusted based on an operator's previous experience. In addition to the certification, operators may need to obtain state-specific licenses/permits.

ATTACHMENT I: Forms

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: **Date:**
Project: **Revision: 0**

Work Plan Summary:

PREREQUISITES		
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**

ACTIVITY HAZARD ANALYSIS (AHA)

ACTIVITY	POTENTIAL HAZARD	PROTECTIVE METHODS AND CONTROLS
	•	•
		•
		•

Special Notes and Instructions: This AHA shall be reviewed by all project employees prior to commencing work and as warranted by; AHA revisions, safe work observations and improvement measures. All employees have the authority to stop work for safety concerns.

AHA Review and Training Acknowledgement:

Employees print name, sign and date in spaces provided below.

PRINT NAME	SIGNATURE	DATE

EMPLOYEE DAILY SIGN IN SHEET

DAY:_____DATE ____/____/____ PROJECT NAME: _____

				CHECK OFF TRADE CLASSIFICATION			
	Workers Name [Print}	TIME IN	TIME OUT	OPERATOR	LABORER	BURNER	PROJECT SUPERVISION
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

DESCRIPTION OF TODAY'S WORK ACTIVITIES:

_____

_____

_____

_____

DAILY SAFE WORK PERMIT

Supervisor Name		**H&S Worker Rep**		**Job Number**	
Lead Hand		**Client**		**Date**	
Job Description:					

Hazard Assessment

Ergonomic Hazards	**Environmental Hazards Cont'd**	**Activity Hazards Continued**	**Access/Egress Hazards**
Working in Tight Area	Ventilation Required	Sensitive Equipment in Area	Partially Obstructed
Parts of Body in Line of Fire	Heat Stress/Cold Exposure	Burn / Heat Sources	Slip/Trip Potential Identified
Working Above Head Height	Other Workers in Area	Compressed Gasses	Excavations
Pinch Points Identified	Inadequate Lighting	Energized Equipment in Area	Scaffold - Inspected and Tagged
Repetitive Motion	Asbestos	Airborne Particles - ie; Chipping	Overhead/Underground Obstruction
Repetitive Awkward Work	Lead	Electrical Cords/Tools-Condition	Other
Environmental Hazards	Mould	Equipment/Tools - Inspected	**Other Site Hazards**
Spill Potential	PCB___Liquid___Ballasts___	Electrical Disconnects	
Weather Conditions	**Activity Hazards**	Mechanical Disconnects	
MSDS Reviewed	Lockout Procedure in Place	Utilities Disconnects	
Poor Housekeeping	Welding / Grinding		

Hazard Control - PPE Requirement

Eyes	**Ears**	**Respiratory**	**Body**		**Other PPE Required**
Safety Glasses	Ear Plugs	Full Face Mask	Hard Hat	Fire Rated Coveralls	Harness
Goggles	Ear Muffs	Half Face Mask	Traffic Vest	Tyvex Suit	Lanyard
Face Shield		Cartridge _____	Gloves	Long Sleeves	
		Dust Mask	Foot Protection		

Hazard Control - Job Site

Spotters	Negative Air Machine (s)	Air Monitoring	Locates/ Disconnects	Spill Kits	Signage
Guardrails	Decontamination Facility	GFCI Cords/Panels	Safe Work Plan	Enclosure	Fall Protection
Lighting	Material Handling Proc.	Hot Work Permit	Communication (radios)	Dust Control	Portable Water
Scaffold	Good Housekeeping	Lockout/Tagout	Inspections Completed	Scrubbers	Safety Shower
Fire Watch	Overhead Protection	Fall Protection Plan	Engineering Controls	Barricades	Warning Signs
Traffic Control	Perimeter Fencing	Proper Trenching	Confined Space Plan	Eye Wash	

Equipment

Skid Steer	Bulldozer	Ladders	Crane	Mini Excavator	Power Washer	PEWP: Aerial or Scissor Lift
Excavator	Lift Truck	Scaffold	High Reach	Generator	Hepa Vacuum	Vacuum Truck

Job Task Analysis

Job Step	**Hazard**	**Control**

All workers must sign below after they have read and understand the Daily Safe Work Permit

Print Name	**Signature**	**Print Name**	**Signature**

SUBCONTRACTOR DAILY SIGN IN SHEET

DAY:_____DATE ____/____/____

PROJECT NAME: _____

Company Name:_____

				CHECK OFF TRADE CLASSIFICATION			
	Workers Name [Print}	TIME IN	TIME OUT	OPERATOR	LABORER	ASBESTOS HANDLER	PROJECT SUPERVISION
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

DESCRIPTION OF TODAY'S WORK ACTIVITIES:

_____

_____

_____

_____

CO-WORKER OBSERVATIONS

- ◯ **COMPLACENT**
- ◯ **REPETITIVE MOTION**
- ◯ **POOR LIFTING POSTURE**
- ◯ **REACHING/STRETCHING**
- ◯ **TWISTING**
- ◯ **NEEDS ASSISTANCE**
- ◯ **OPERATOR NOT TRAINED**
- ◯ **BALANCE TRACTION**
- ◯ **BENDING**
- ◯ **LIFTING TOO MUCH**

DISCUSSED WITH CO-WORKER? **Y** **N** (Circle one)

OTHER/COMMENTS: _____

_____

_____

_____

_____

SAFETY TASK ANALYSIS CARD

NAME: _____

DATE: _____

PROJECT:

TASK (i.e. Burning, Equipment Operating, Lifting Etc.)

_____

DID YOU REVIEW A JSA? **Y** **N** (Circle One)

WHAT PPE IS REQUIRED?

- ◯ **HARD HAT**
- ◯ **HI-VIS VEST**
- ◯ **SAFETY SHOES**
- ◯ **FALL PROTECTION**
- ◯ **SAFETY GLASSES**
- ◯ **RESPIRATOR**

HAVE YOU INSPECTED YOUR EQUIPMENT & PPE? **Y** **N** (Circle one)

HAVE YOU TRAINED FOR THE TASK? **Y** **N** (Circle one)

DO YOU BELIEVE ALL HAZARDS HAVE BEEN ADEQUATELY ADDRESSED? **Y** **N** (Circle one)

SELF AWARENESS

WHAT OTHER HAZARDS ARE YOU WORRIED ABOUT?

_____

_____

IS YOUR PPE/EQUIPMENT FUNCTIONING OK? **Y N**

DID YOU NOTIFY YOUR SUPERVISOR? **Y N**

WAS IT CORRECTED? **Y N**

HOW? _____

_____

_____

DO YOU BELIEVE ALL HAZARDS HAVE BEEN ADEQUATELY ADDRESSED? **Y N** (Circle one)

IF NOT, STOP WORK AND REPORT TO SUPERVISOR.

CO-WORKER OBSERVATIONS

- ◯ **PPE USED INCORRECTLY**
- ◯ **RUSHING**
- ◯ **TOO... HOT COLD NOISY** (circle as appropriate)
- ◯ **EQUIPMENT: UNSAFETY CONDITION**
- ◯ **EQUIPMENT: INAPPROPRIATE FOR TASK**
- ◯ **EQUIPMENT: CAPACITY EXCEEDED/UNKNOWN**
- ◯ **MISSING/DEFICIENT SAFETY GUARD** (Guard Rail, Retainer, Fire Extin.)
- ◯ **ENERGY ISOLATION NEEDED** (Electricity, Hydraulic, Pneumatic, Etc.)
- ◯ **POOR WORKING SURFACE**
- ◯ **DUSTY**
- ◯ **ODORS SMELLED**
- ◯ **POOR HOUSEKEEPING**
- ◯ **DISTRACTED**
- ◯ **FATIGUED**

Daily Equipment Inspection

Contractor:_____ **Checked By**:_____

Type of Equipment:_____ **Date:**_____

Items Inspected/Maintained Daily	Mn	Tu	Wd	Th	Fri	St	Sn	**Remarks/Service**
As equipped check condition of tires or tracks								
Check all hoses/hydraulics/air								
Grease all fittings as required								
Check fluids(coolant, oil/hydraulic)								
Check brake function/steering and linkage								
Check for physical damage (welds, covers/guards)								
Check emergency brakes/stops/lockouts								
Check horn & backup alarm								
Safety belt (seated equip.)/tie-off point(man lifts)								
Check all windows and mirrors (if equipped)								
Check warning decals (legible in place)								
Equipment Warm-up (check instruments/indicator lights)								
Check control levers for proper operation								
Is Maintenance schedule current (see next scheduled maintenance hours)								

NOTES:

Powered Aerial Lift Inspection Form (Inspect Applicable Items Per Type of Lift)

CONTRACTOR	
RENTAL COMPANY	
JOBSITE	
INSPECTED BY (PRINT NAME)	
MAKE (Fuel Type) /SERIAL OR UNIT No.	
DATE (S) –WEEK ENDING	

ITEMS (= SATISFACTORY, X = NEEDS ATTENTION, NA = Not Applicable for type of lift)	MON	TUE	WED	THU	FRI	SAT	SUN
Brakes							
Operating Controls Labeled							
Operating and Emergency Controls							
Fuel System							
Guards and Handrails							
Entrance Gate (Safety Chain, Bar or Gate)							
Batteries							
Load Charts & Labels							
Muffler/Exhaust Pipes							
Operating Manual							
Engineered Tie Off Points							
Tires, Wheels or Tracks, Outriggers							
Cylinders, Lines, Hoses, Wires (air, fluid leaks, electrical wires cables intact)							
Loose, Missing/Damaged Parts, Physical Condition							
Air System Leaks Signs of Damage							

REMARKS:

Daily Safety Brief

Focused Safety Topic – _____

Attach focused safety topic material or use back of page for additional space "See Attached or Reverse" ➡

Summary of today's activities, identified hazards and protective measures.

ACTIVITIES: _____

_____

_____

EQUIPMENT REQUIRED: _____

_____

HAZARDS (circle, highlight or list): Traffic Struck by Caught Between/Pinched Head Eye Hand/Arm/Leg/Foot Slips/Trips/Falls Overhead/Drop Collapse/Cave-In Stored Energy Electrical/Shock Impalement Fire Weather Heat Cold Asphyxiation CO Lung Irritants Dust Asbestos LOPC Chemical PCB CO VOC's Gas Lightning Noise Vermin/Pests Rollover Other: _____

_____

PROTECTIVE MEASURES (circle, highlight or list): See Hot Work Permit See Confined Space Permit See AHA STAC MSDS Guards Barricades GFCI PPE Signs Spotter Alarms Warning Line Life Line Net Seat Belts ROP Shoring/Bracing Inspect "Auth. Stop Work" Fire Ext. Water/Misting Controlled Work Zone Ventilation Add Lighting Cones Covers De-energize Lockout/Tagout Air Gap Heat/Cold Stress Monitoring, Air Monitoring, Other/Remarks:

_____

APPROVED PPE REQUIRED (circle, highlight or list): Hardhat Safety Glasses Foot Protection Gloves High Visibility Vest or Equivalent High Visibility Clothing Hearing Protection Face Shield Mono-Goggles Respirator Special Protective Clothing (Burning Jacket & Shield, Gloves, Boots) Personal Fall Arrest/Restraint System Welding Hood Life Vest Metatarsals, Other: _____

Participants Print Name	Participants Print Name	Participants Print Name

Safety Talk Give by: _____ **DATE:** _____

Project/Location: _____

INCIDENT REPORT

Document Revision 6/16/15

GENERAL INFORMATION

Project Name: _____

Project Address: _____

Site Manager: _____ Phone No. _____ Work Shift: _____

Date of Incident: _____ Time: _____

Type of Incident: ☐ Injury ☐ Property Damage ☐ Spill ☐ Fire ☐ Other: _____

AFFECTED EMPLOYEE OR PROPERTY OWNER INFORMATION

Employee/Owner Name: _____

Date of Birth: _____ Male/Female: _____

Address: _____

Department: _____ Years/date Employed: _____

MEDICAL INFORMATION (NA If Not Applicable)

Name and Address of Doctor: _____

Hospital and Phone Number: _____

Substance Abuse Testing: As a result of this incident, was this employee?

Substance Abuse Tested? ☐ Yes ☐ No Alcohol Tested? ☐ Yes ☐ No

Was this a First Aid only incident? ☐ Yes ☐ No

Has the Employee returned to work? ☐ Yes ☐ No If Yes, Date: _____

INCIDENT DESCRIPTION (Facts and Findings)

What activity or task was performed at time of incident? (Please be specific, what was the employee doing, identify equipment or material the employee was using.)

_____

_____

_____

_____

INCIDENT REPORT

Document Revision 6/16/15

How did the incident occur? (Please describe fully the events that resulted in the incident. Tell what and how it happened. Employee and witness statements, finds fact, contributing factors, Use a separate sheet if necessary.)

Object or substance that directly injured the employee: _____

Object or substance that damaged property: _____

OSHA 300 INFORMATION (To be completed by Corporate Safety Department)

Does Incident Involve Fatality:	☐ Yes ☐ No	Was the Incident Medical Only:	☐ Yes ☐ No
Has the Employee Returned to Work:	☐ Yes ☐ No	Is Incident OSHA Recordable:	☐ Yes ☐ No
Date: _____		Involve Lost/Restricted Work Days:	☐ Yes ☐ No

Current Work Status: _____ OSHA File No. (or N/A): _____

CORRECTIVE ACTION AND COMMENTS:

IMPLEMENTATION DATE: _____

_____ _____

Completed by: Supervisor Print & Sign Name **Date**

_____ _____

Reviewed By – Corp. Safety **Date**

JOB SAFETY INSPECTION AND AUDIT

LOCATION/PROJECT: **Date:**

Audit and Inspection Report by:

OSC Summary of Findings and Improvement Measures:

DESCRIPTION	YES	NO	N/A	COMMENTS/ACTIONS
SAFETY ADMINISTRATION, POSTINGS, FIRST AID & EMG RESPONSE				
1. OSHA 300A form posted between February 1 and April 30				
2. LABOR POSTINGS (ALL IN ONE FEDERAL & STATE)				
3. Emergency Phone number for the nearest medical center posted				
4. Safety Briefs/Talks & AHA's current and up to date.				
5. Work areas properly delineated (barricaded) and hazard warning signs				
6. Appropriate First Aid Supplies and Trained Personal Available				
7. Training Documentation Complete (40 Hour, OSC BASIC 10/OSHA 10, NYS Asbestos Hard Card Supervisors/Handlers)				
HOUSEKEEPING				
1. Work area neat, debris picked up and free of trip hazards				
2. Projection and impalement hazards eliminated/protected (removed,				
3. Waste containers provided and used				
4. Passageways and walkways clear				
5. Cords and leads off of the floor				
6. Spill Kit Available & Stocked				
FIRE PREVENTION				
1. Adequate firefighting equipment (hoses, extinguishers, fire blanket)				Need additional fire extinguishers (Minimum 2A Rating).
2. Appropriate Flammable and Combustible Storage				
3. "No Smoking" signs posted and enforced near flammables				
ELECTRICAL AND CONTROL OF HAZARDOUS ENERGY				
1. Extension cords with bare wires or missing ground prongs taken out of				
2. Ground fault circuit interrupters being used				
3. Terminal boxes accessible and equipped with required covers				
4. Temporary Lighting (Guarded, Covered, No Exposed Sockets)				Corrected, light guard/cage closed, open sockets plugged.
5. Equipment wiring				Corrected, Romex connector for hot water tank missing.
6. Proper Hazardous Energy Controls (LOTO, Air Gapping, Blanks)				
HAND, POWER & POWDER-ACTUATED TOOLS				
1. Hand tools inspected regularly				
2. Guards in place on equipment				
3. Right tool being used for job at hand				

DESCRIPTION	YES	NO	N/A	COMMENTS/ACTIONS
4. Operators of powder-actuated tools are licensed				
FALL PROTECTION				
1. Safety guard rails properly installed and inspected.				
2. Employees exposed to fall hazards are protected (PFAS 100% Tie-off Guards, Covers, Nets)				Observed Burner torch cutting duct work from step ladder properly tied off. Observed abatement worker installing hard barricade on 2nd floor
3. Employees below protected from falling objects (Toe Boards or Guards)				Area barricaded from entry below with spotter.
LADDERS				
1. Straight Ladders extended at least 36 inches above the landing, proper				
2. Ladders inspected & properly use (secured, proper angel, type)				
3. Ladders with split or missing rungs taken out of service (tagged out)				
4. Stepladders used in fully open position				
SCAFFOLDING				
1. All scaffolding inspected daily by a competent person				
2. Erected on sound rigid footing				
3. Tied to structure as required				
4. Guardrails, intermediate rails, toe boards and screens in place				
5. Planking is sound and sturdy				
6. Baseplates and mudsills in place				
7. Proper access provided				
8. Employees below protected from falling objects				
FLOOR & WALL OPENINGS				
1. All floor or deck openings are planked over or barricaded				
2. Perimeter protection is in place				
3. Deck planks are secured				
4. Materials stored away from edge				
TRENCHES, EXCAVATION & SHORING				
1. Competent person on hand				
2. Excavation proper protective system (shored or sloped/benched)				
3. Materials and spoil piles are stored at least two feet from trench				
4. Ladders provided every 25 feet in trench > 4 ft depth				
5. Equipment safe distance from edge of trench or excavation				

DESCRIPTION	YES	NO	N/A	COMMENTS/ACTIONS
6. Warning system in place if operator cannot see edge of trench				
MATERIAL HANDLING & HAZARD COMMUNICATION				
1. Materials are properly stored or stacked				
2. Employees are using proper lifting methods				
3. MSDS/SDS Available/Proper Containers & Labels Noted				
4. Chemical Products properly used and stored per MSDS/SDS				
WELDING & BURNING				
1. Gas cylinders stored upright, securely, and in good condition				
2. Proper separation (20 ft) between fuels & oxygen or fire barrier				
3. Burning/welding/cutting goggles or shields are used				
4. Fire extinguishers are nearby (< 75ft				
5. Equipment & Hoses are in good condition. Flash arrestor equipped.				
RIGGING, HOISTING/LIFTING & PLACING ACTIVITIES (HOISTS, CHAINFALLS, CRANES & FORK TRUCKS)				
1. Proper setup of lifting/hoisting equipment, controlled work zone established, swing radius barricaded & spotter provided				Observed proper lifting of metal debris box by rough terrain fork truck to upper level for load out of copper wire.
2. Operator familiar with load chart (lifting capacity, weight of load <75% Max capacity of lifting/hoisting equipment & rigging components)				
3. Proper communication (radio communication, hand signals)				
4. Equipment & rigging inspected. Hoisting/Rigging by competent person.				
5. Employees kept from under suspended loads				
6. Chains and slings inspected (ANSI rated & properly tagged).				
7. Pick plan available and reviewed with crew				See AHA
8. Competent operator, rigger and flagman				
POWERED EQUIPMENT (Earth Moving, Fork Trucks, Aerial Lifts, ATV's				
1. Equipment Physical Condition, daily inspection current with equipment (Guards, Lights, Glass/Cage, Tires/Tracks, Lights, Frame)				
2. Operational and Safety Controls Functional				
3. Proper Operation and Use Observed				

DESCRIPTION	YES	NO	N/A	COMMENTS/ACTIONS
4. Operators Manual Available and Inspection Check List Available with Equipment				
PERSONAL PROTECTIVE EQUIPMENT				
1. Proper Head Protection used given task (ANSI Rated Hard Hats, Properly Worn)				
2. Proper Eye Protection given task (ANSI Rated Eye and Face Protection)				
3. Required Respirators given task (Proper Use, Care, Training & Medical)				
4. Proper Hearing protection is being worn as required (NR Rating)				
5. High-visibility vests or equivalent high vis clothing are being worn				
6. Proper Hand, Foot, Leg, face & Skin Protection given task (Gloves, Safety Boots, Chaps, Metatarsals, Clothing - FR, Chemical)				
ABATEMENT				
1. Decontamination unit properly installed and functioning (Shower, Filtration, Dirty Room, Clean Room & Waste Out).				
2. Proper negative air established, # units, monometer, backup units, temporary power, lighting, GFCI, exhaust, barricades & waste storage				
3. Containment properly installed (air locks, EMG egress, hazard signs)				
4. Proper abatement methods observed (PPE, Wet Methods & Handling)				
5. Entry exit log in use and properly completed				
6. Supervisors log and inspections current				

Select Site Photos

Select Site Photos Continued

ATTACHMENT II RESERVED: Site-Specific Activity Hazard Analysis

(To be revised and re-inserted as needed)

OSC	**ACTIVITY HAZARD ANALYSIS (AHA)**

Activity: Asbestos removal **Date:**
Project: Tonawanda Coke **Revision:**

Work Plan Summary:

PREREQUISITES		
EQUIPMENT TO BE USED/SITE ENTRY	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
THIS AHA TO BE PREPARED BY SITE HSO BASED ON ACTUAL MEANS & METHODS		

OSC	**ACTIVITY HAZARD ANALYSIS (AHA)**

ACTIVITY	POTENTIAL HAZARD	PROTECTIVE METHODS AND CONTROLS

Special Notes and Instructions: This AHA shall be reviewed by all project employees prior to commencing work and as warranted by; AHA revisions, safe work observations and improvement measures. All employees have the authority to stop work for safety concerns.

AHA Review and Training Acknowledgement:

OSC	**ACTIVITY HAZARD ANALYSIS (AHA)**

Employees print name, sign and date in spaces provided below.

PRINT NAME	SIGNATURE	DATE

Activity Hazard Analysis
Project: Tonawanda Coke

Demolition / Dismantling

Note: All printed copies of this document are uncontrolled. It is the responsibility of the user to assure that he has the latest revision by checking the electronic version in the HSE Document Library

Activity: Building/Structure Demolition and Dismantling	**Date:** October 9, 2019
Description of the Work: This AHA outlines the activities, hazards and associated hazard control with respect to Structure Demolition and Dismantling	**OSC Site Supervisors:** **OSC HSE Director:** Donald Dustin **OSC HSO**:
Project:	**Review for Latest Use:** Prior to beginning field work.

PLAN

1. Initial ground clearing / Creating access
    - 1.1. Loose Material Cleanup
    - 1.2. Equipment Sizing
        - 1.2.1. Torch Cutting (option)
        - 1.2.2. Shearing Equipment (option)
        - 1.2.3. Grapple Utilization / Loading for Disposal
2. Demolition/dismantling options
    - 2.1. Rotating Shear Utilization
    - 2.2. Mechanical Dismantling

      Utilizing a hydraulic excavator, the Operator will remove sections of the exterior walls, creating access to the roof structure and/or elevated floor structures. The Operator will continue structure dismantling by breaking free or "dropping" sections of building. Demolition in close proximity to utilities designated to remain in place: as approaching areas of critical wrecking, installation of barricades or protection of features requiring preservation will be put in place, a "drop" area away from the feature will be cleared and isolated, then the building section will be setup to fall or be pushed away from the specific feature.
    - 2.3. Torch Cutting
    - 2.4. Elevated Torch Cutting / Utilization of Aerial Lift. (option)
    - 2.5. Grapple Utilization / Control of Torch Cut Equipment (option)
    - 2.6. Equipment Sizing: Torch Cutting and Shear Utilization (option)
    - 2.7. Grapple Utilization / Sorting and Loading of Materials

Work Activity Sequence	Potential Health, Safety and Environment Hazards	Hazard Controls
Pre task inspection of work area and crew review/ walk through/General Site Conditions.	▪ Slips, Trips, and Falls ▪ Struck by ▪ Skin ▪ Eye Protection ▪ Hand injuries/cuts/bruises	▪ Trained personnel (HASP). ▪ All demolition will be conducted under the direction of an onsite demolition competent person. ▪ Minimum PPE includes hard hat; safety glasses, safety toed boots, high visibility vest/ Leather or cut resistant gloves when handling materials. ▪ Inspect all PPE, tools, and equipment each shift prior to use. ▪ Any sign of thunder, lightning, rain, high winds (>20 mph) immediately terminate all outside work activity, seek shelter and wait for 30 Minutes and for further instruction. ▪ Locate nearest shelter in place facility, eye wash, safety showers, alarm boxes, and point out windsock. ▪ Dress appropriately for conditions. Know the signs and symptoms of heat stress and cold stress. Stay hydrated and take breaks as needed in a cooled or heated area. ▪ Wear hearing protection (earplugs or muffs) if you have to shout to be heard at a distance of 3 feet or less.
Equipment setup inspection and operation	▪ Slips, Trips, and Falls ▪ Struck by ▪ Skin ▪ Eye Hazards ▪ Lacerations ▪ Equipment Failure	▪ Equipment operator to review traffic path of equipment within site to setup area. Inspect for traffic hazards, obstructions, overhead hazards, electric lines, chemical lines, gas lines, and surface hazards (potholes, voids, uneven surfaces, and unstable ground). ▪ Adequate clearance shall be maintained between the equipment and any obstructions. Minimum distance to be maintained from energized power line is 10 feet plus 0.4 feet for every 1 kV over 50 kV. ▪ If equipment becomes electrically energized, personnel shall be instructed not to touch any part of the lift or touch any person who may be in contact with the electrical current. ▪ Conduct a 360 degree walk around inspection of all equipment and vehicles before moving equipment/vehicles. ▪ Minimum of one spotter is required when driving equipment to setup area. Flagman is to assure path is clear and assist operator of equipment. ▪ Only one person shall signal the equipment operator. This person shall be thoroughly familiar with all of the equipment's operation and shall be able to communicate with the equipment operator with the appropriate hand signals. ▪ No personnel shall be permitted on or under the load lifted by equipment or hoist at any time. ▪ Equipment operator to review traffic path (drive path) of equipment within setup area. Inspect for traffic hazards, obstructions, overhead hazards,

		electric lines, chemical lines, gas lines, surface hazards (potholes, voids, uneven surfaces, unstable ground, etc.). ▪ A competent person shall inspect equipment, hoists, and rigging prior to each use. Frequency and method of inspection shall be completed according to manufacturer's specifications. Inspections should also occur after any particularly stressful lifts to all involved components. ▪ Swing area of equipment shall be barricaded. ▪ Accessible areas within the swing radius of the rotating parts of the equipment shall be barricaded to prevent an employee from being struck or crushed by the equipment. ▪ Only the operator may be on the equipment during operation. ▪ Always maintain three points of contact when inspecting equipment components or entering and exiting the equipment. Utilize safety steps and grab bars. Inspect steps and grab bars prior to use. ▪ Equipment operations shall end when wind speed is greater than 20 mph, or less as dictated by the equipment set up and operating conditions/manufacturer's recommendations. ▪ No cell phone use while operating any equipment. ▪ No eating, drinking, or use of tobacco products in equipment or machines. ▪ Inspect all PPE, tools, and equipment each shift prior to use.
Set up barricades and warning signs	▪ Slips, Trips, and Falls ▪ Struck by ▪ Skin ▪ Eye Protection ▪ Fire ▪ Heat Stress ▪ Cold Stress ▪ Lacerations	▪ Perform housekeeping in area of work. ▪ Keep all work areas free of debris and trip hazards. Clear work are periodically throughout the day and at the end of shift. ▪ Controlled work zone designed to keep personnel away from work equipment and other overhead hazards. ▪ RED Barricade tape shall be used to define boundaries of ALL overhead work. ▪ Use temporary lighting as necessary to properly illuminate work area. ▪ Inspect all corded tools and extension cords prior to use. ▪ GFCI with all temporary power and corded tools (at receptacle or attached to cord).. ▪ Utilize proper lifting procedures. Use mechanical means when available to lift material, and if you cannot lift the material mechanically ask for help from another co-worker. If you are unsure ask your supervisor for explanation.
Equipment Operations (demo, loading, and moving)	▪ Slips, Trips, and Falls ▪ Struck by ▪ Skin ▪ Eye Hazards ▪ Fire ▪ Heat Stress ▪ Lacerations	▪ Use only trained Heavy Equipment Operators. ▪ Operation per manufacturer specifications and instructions. o Equipment shall be inspected prior to use, and the inspections shall be documented. ▪ Do not approach or cross the path of any equipment until you have made eye contact with the operator and are granted permission.

		▪ No eating, drinking, or use of tobacco products in or near controlled work zones. ▪ Inspect all PPE, tools, and equipment each shift prior to use. Wear leather gloves if handling sharp or rough edged materials. ▪ Spotter required for all lifted and transported loads. ▪ Tag line with all suspended loads. Personnel are never permitted to work beneath suspended loads. ▪ Adequate clearance will be maintained between lift and any obstructions. Minimum distance to be maintained from energized power line is 10 feet plus 0.4 feet for every 1 kV over 50 kV. ▪ If equipment becomes electrically energized, do not touch any part of the lift or touch any person who may be in contact with the electrical current. ▪ Equipment shall never be left unattended with engine running. ▪ Equipment will be shut off, with buckets or forks lowered when the operator is not on the equipment. ▪ Additional passengers riding on the equipment is prohibited. ▪ All hoisted loads shall be from a level position. ▪ If any fire hazard is determined by supervision a fire watch will be available to watch for ignition of any fire. Fire watch will not have other duties and will remain in area for 30 minutes after hot work is completed. ▪ A hose, fire extinguisher, or other retardant will be available to extinguish these sparks. The work area around will remain wet as another line of defense against fire
Shear and Grapple Operation (optional)	▪ Fall ▪ Struck by ▪ Caught between ▪ Crushed ▪ Dropping materials ▪ Structural failure	• Inspect equipment prior to use. Document inspection. • Only trained and qualified workers will operate equipment. • Have spotter to ensure work area remains clear of employees and to spot potential discharge or any other danger that could occur as result of demolition. • Spotter shall be a safe distance from active demolition. ▪ Demonstrate pinch point areas to employees to ensure their knowledge of this potential. ▪ Cab doors and windows will be closed during demolition. ▪ Clear the tracking path of debris to preclude ends of debris from contacting the cab windows. ▪ Whenever possible, when moving debris, swing boom away from the cab to preclude debris from impacting the cab windows. ▪ Shear/Grapple equipment will be staged a sufficient distance away from any structure that is being dismantled so that if there is a structure failure, the resulting fall will not impact the equipment. ▪ Operator will maintain three points of contact when entering/exiting equipment. ▪ Remove mud or other slippery materials from the soles of shoes before climbing into/on the machine.
Metal cutting operations (optional)	▪ Slips, Trips, and Falls ▪ Struck by	▪ Obtain safe work permit and hot work permit prior to start of work. ▪ Inspect all PPE, tools, and equipment each shift prior to use.

	▪ Respiratory Hazards ▪ Skin ▪ Eye Hazards ▪ Fire ▪ Heat/Cold Stress ▪ Lacerations ▪ Burns ▪ Fall Protection	▪ Take breaks as necessary to prevent heat stress and cold stress. Drink plenty of fluids. ▪ Secure oxygen/LPG tanks. These tanks can become missiles if valves are damaged. ▪ Oxygen and propane (LPG) bottles will never be stored together. Tanks must be a **minimum** of 20 feet apart when stored.. ▪ A cage for each material will be used onsite for cylinder storage and transport. ▪ Flash arrestors shall be in use. ▪ At a minimum – all workers cutting shall wear OSC issued 'burn' jackets (or similar), over long sleeve shirts, pants and leather gloves to prevent burns to the skin. ▪ Proper eye protection shall be worn to protect the eyes from burns (cutting goggles/glasses). Shade 5 or more must be used to prevent burns while using the plasma cutter or torch cutting. ▪ A face shield or equivalent must be worn to prevent hot slag or metal from burning face. ▪ Inspect tools prior to use ▪ Barricade area around metal cutting operations. Also barricade below if on higher levels and ensure personnel on levels below are protected. ▪ Secure ladders and ensure they are 3 feet above upper landing. Inspect ladder prior to use. Do not use a broken or compromised ladder. Step ladders will be used in a full open and locked position. Only one person may use a ladder at a time. Do not carry tools or equipment up a ladder; use a rope to raise and lower tools and equipment. Tie off ladder to prevent movement. Do not lean off side of ladder, reposition the ladder. ▪ If worker is at 6 feet or higher on the ladder and cannot keep a three point stance use an appropriate means of doing the task (scissor lift, rolling platform, etc.). ▪ Monitor drains for LEL prior to commencing hot work. Do not proceed if there are any readings. Cover drains with fire blanket and wet blanket prior to beginning any hot work. ▪ A fire watch will be assigned to watch for ignition of any fire. Fire watches may be needed on multiple levels. ▪ Fire watch will not have any other assigned duties. Fire watch to remain a minimum of 30 minutes after the hot work/torch cutting is completed. A water hose or appropriate fire extinguisher will be available to extinguish these sparks. The work area around will remain wet as another line of defense against fire. ▪ Prior to starting any hot work, the supervisor and the person performing the torch cutting will inspect the area where the hot work will take place to ensure there are no flammable or combustible materials

Refueling equipment Equipment Maintenance	▪ Slips, Trips, and Falls ▪ Struck by ▪ Respiratory Hazards ▪ Skin ▪ Eye Hazards ▪ Fire ▪ Burn ▪ Heat/Colds Stress ▪ Lacerations ▪ Pinch points ▪ Spills	▪ Take breaks as necessary to prevent heat/cold stress. Drink plenty of fluids. ▪ Minimum standard site required PPE for inspection (ANSI approved safety glasses with side shields for eye protection, head protection, hearing protection (>85 dB), hand protection, steel toed boots, and high visibility reflective vests or clothing. Splash shield to be used for fueling. ▪ Portable fuel cans shall be metal (no plastic) with spark arrestor in place. ▪ Fuel cans, oils, greases, etc. shall be properly labeled. ▪ Turn off equipment prior to fueling, ▪ Fueler will remain at nozzle and latch open handle will not be used. ▪ 10 lb. ABC dry chemical fire extinguisher will be available at all times. ▪ If qualified, in the event of a spill, clean-up any material with absorbent pads and report incident to OSC Site Supervision. ▪ Verify areas and operation of safety showers and eyewash. ▪ Pads or drips pans shall be placed under fuel inlet to catch overflow or drips. ▪ Equipment will be shut down during any maintenance activity. ▪ Use mechanical blocking prior to working on equipment. ▪ Place plastic or spill material on the ground/area beneath the equipment if there is any potential for a spill (hydraulic hose repair, install/repair/change out attachments. ▪ Depending on repairs needed, a separate AHA may be required to address maintenance tasks. Review tasks with OSC Safety prior to starting maintenance to ensure tasks are addressed in this AHA.
		▪
Equipment to be used (Equipment to be used in the work activity)	**Inspection Requirements** (Inspection requirements for the work activity)	**Training Requirements** (Training requirements including hazard communication)
Hydraulic Excavators	▪ Daily (before each use) by certified, competent operator. ▪ Document daily	OSC Equipment Operator training documentation
Equipment: Shear/Grapple Hammer Attachments (optional)	▪ Daily (before each use) by certified, competent operator. ▪ Document daily	OSC Equipment Operator training documentation
Aerial Lift (optional)	▪ Daily inspection (before each use) by trained and authorized boom lift operator. ▪ Document daily inspections.	OSC Aerial lift training documentation
Torches/Gas Cylinders & Lines/Extinguisher/Hoses	▪ Daily inspection (before each use) by superintendent, supervisor, and workers.	

	▪ Jobsite inspection by superintendent, and SHSEO	Employee jobsite safety training is done through orientation, daily toolbox safety meetings, STAC cards and as needed on the jobsite
Hand tools	▪ Daily inspection (before each use) by superintendent, supervisor, and workers. Jobsite inspection by superintendent and, SHSO	

	PRINT	**SIGNATURE**	
Site Superintendent:	_____	_____	**Date/Time:** _____
Site HSE Officer:	_____	_____	**Date/Time:** _____
Employee Name(s):	_____	_____	**Date/Time:** _____
	_____	_____	**Date/Time:** _____
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	_____	_____	**Date/Time:** _____

ACTIVITY HAZARD ANALYSIS (AHA)
Heavy Equipment Operation

Activity: Heavy Equipment Operation & Dirt Moving
Project: Tonawanda Coke

Date: October 2019
Revision:

PREREQUISITES		
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
Heavy Equipment: Excavators, Loaders, Dozers, Skid Steer, Rollers, etc. 5 – 20 lb. ABC Dry Chemical Fire Extinguishers.	Daily heavy equipment inspection prior to operation. Complete and turn in OSC inspection form to site superintendent. Deficiencies must be corrected prior to operation. Inspect all PPE equipment and extinguishers prior to operation/work.	Trained employees per the site HASP. OSC authorized and competent designated equipment operators

WORK ACTIVITY	POTENTIAL HAZARD	PROTECTIVE AND CONTROL MEASURES
Equipment operations; • Material handling • Grading • Rolling/compacting, • Excavating, moving & loading • Hauling	• Struck by • Roll over • Crush, • Fire/burn • Caught between	• Only OSC authorized and qualified personnel shall operate equipment. • Complete and submit daily inspections on the "Daily Equipment Inspection Checklist." • Back up alarms must be functional. • Equipment in need of repair, defective, or unsafe in any way, shall be taken out of service. Equipment shall not be placed back into service until repaired and inspected by competent person/operator. • UFPO clearance and mark out of underground utilities (see below). • Weather assessment for acceptable working conditions, no high winds, excessive rain, snow, ice or lighting/thunder. • Equipment, setup and operation and inspection by company trained and authorized operator. Step and walk with purpose, watch where you are placing your feet (pick them up and set them down). Use machine grips, rails and footsteps when accessing and leaving equipment (3 points of contact). • Ground personnel shall be kept clear of operating equipment and make eye contact with operator before entering line-of-fire.

		• Spotters must be used when moving into blind-spots or when overhead obstructions are present (see OSC Spotter Policy). • Personnel shall not pass under operating equipment attachments at any time, whether loaded or not. • Loads shall be lowered, and power shut off when equipment is left unattended. • Only stable, safely arranged loads, which do not exceed the equipment capacity, shall be handled.
	• Collision with personnel/property	• The operator shall slow down and sound the horn in areas of reduced visibility. Safe speeds shall be maintained. Speed shall be reduced in high traffic areas and across rough roadways.
	• Driving off elevated surface	• A safe distance shall be maintained from any edge such as berms, platforms or loading docks. If not visible to the operator, a spotter shall be used. • Seatbelts shall be worn when equipment is in operation.
Operation and refueling.	• Fire • Splash/eye contact	• Fire extinguishers shall be mounted on all powered mobile equipment as well as 20 lb ABC dry chemical in refueling area, w/ spill kit. • Splash shield shall be worn when handling liquid fuels. • Equipment shall be shut-off prior to refueling. • Flammable fuel containers must be grounded and bonded before fueling. • No smoking or spark sources shall be allowed near refueling or battery maintenance areas.
	• Electric shock	• No work may be performed within 20 ft of energized electrical lines. • Contact OSC superintendent if any work is to be conducted within 20ft of an energized electrical source.

Hand shoveling to uncover buried lines	• Slip, trip fall • Struck by • Strain • Electrocution • Fire, burn	• Use care during foot travel, and clear the area of slip and trip hazards, cover holes, make use of barricades, and guard rails as appropriate • Use good body mechanics when lifting and manual material handling; keep back straight, lift with legs, don't twist. Observe lifting limits & keep dead lifts < 40 lbs., get help when you need it, use the equipment. • When hand auger is required, use proper hand auguring techniques – do not over-force any auguring – auger using a smooth and easy pace – avoid contacting subsurface materials when not wearing protective clothing – leather work gloves with hand auger – nitrile gloves when touching potentially contaminated materials • UFPO identified lines shall be carefully hand shoveled (remove material in flat and angled layers without straight down picking to damage buried line, excavator digging is prohibited in these areas (UFPO mark outs & flagging/buried line tape).

AHA Review and Training Acknowledgement:

Employees print name, sign and date in spaces provided below.

PRINT NAME	SIGNITURE	DATE

OSC	**ACTIVITY HAZARD ANALYSIS (AHA)** **Enhanced Equipment Decontamination**

Date: October 2019

Activity: Decontamination of Equipment **Revision No.**

Work Plan Summary:
The need for this extended procedure shall be determined by the superintendent in conjunction with the project manager and client representative. Setup up controlled work zone for decontamination work area and containment system for collecting wash and rinse from decontamination process. The following double wash rinse process shall be followed:

1. First Wash – cover with (wipe, brush or spray) phosphate detergent and scrub with brush and pad, 1 minute per square foot
2. First Clean water rinse - 1 gallon per square foot
3. Second wash – cover with hexane solvent (small hand spray bottle or brush), scrub or brush, 1 minute per square foot
4. Second rinse – wet entire surface with clean hexane solvent for 1 minute.

PREREQUISITES		
EQUIPMENT TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
Excavator w/attachments Various hand tools (shovels, rakes) ABS Dry Chemical Fire Extinguisher PPE – ANSI approved hard hat, safety glasses and face protection (face shield). Disposable poly coated tyvek coverall or equivalent disposable protective clothing. Hard toed rubber safety boots or equivalent protective footwear, impermeable cut resistant gloves or equivalent (Kevlar or Nitrile). Hearing protection as needed, Eye wash and washing station.	Work area inspection and work process inspection by competent person. Replace any defective equipment from use. Inspect hand tools, corded tools, GFCI, PPE, and extinguisher daily prior to use. Replace any defective PPE, extinguishers and tools. Daily equipment inspection (per MFG guidelines) prior to use by authorized and trained operator. Repair and or replace any defective equipment prior to use.	Trained operator and laborer. Site required training per SHSP. OSHA applicable training requirements (1926.20 - 1926.21); hazard awareness training, medical clearance, fit test/training for respirator use, and AHA review prior to start of the job. Use of detergent solvent.

WORK ACTIVITY	**POTENTIAL HAZARD**	**PROTECTIVE AND CONTROL MEASURES**
Establish controlled work zone for decontamination work and install collection system.	Slip, trip, fall, struck by, pinched, traffic, heat stress, cold stress, fire, burn, strain.	• Trained/authorized employees and site required modified level D PPE as defined above. Inspect equipment and tools before each use as required. Traffic spotter provided during loading, unloading operations and setup (back alarm equipped vehicles). • Fire extinguisher in immediate work area. Heat stress, drink before you get thirsty, stay well hydrated, heat stress monitoring per OSC HASP. Cold stress (< 30 degrees), dress in layers, recognize early symptoms – blue discolored tone, lips fingernails, shivering, and lethargic behavior. Take frequent breaks out of the cold and seek warm shelter. Maintain the buddy system, no one works alone, always working within line of sight of supervisor, all employees have stop work authority. Observe good body mechanics when lifting get help when needed, use equipment. Keep work area clear and uncluttered, free of debris and trip hazards.

OSC	**ACTIVITY HAZARD ANALYSIS (AHA)** **Enhanced Equipment Decontamination**

Date: October 2019

Activity: Decontamination of Equipment **Revision No.**

WORK ACTIVITY	**POTENTIAL HAZARD**	**PROTECTIVE AND CONTROL MEASURES**
Washing and rinsing 1st and 2nd.	Slip, trip, fall, struck by, pinched, traffic, heat stress, cold stress, chemical, eye, skin, hazards,	• Trained/authorized employees and site required modified level D PPE as defined above. Inspect equipment and tools before each use as required. Product use per SDS (see attached) • All decontamination to be done in prepared location (equipment decon pad or waste decon pad)
Special Notes and Instructions: This AHA shall be reviewed by all project employees prior to commencing work and as warranted by; AHA revisions, safe work observations and improvement measures. All employees have the authority to stop work for safety concerns. Any questions concerning the content of this AHA contact OSC Safety, Donald Dustin 716-560-7542.		

Field Notes:

OSC	**ACTIVITY HAZARD ANALYSIS (AHA)** **Enhanced Equipment Decontamination**

Date: October 2019

Activity: Decontamination of Equipment **Revision No.**

AHA Review and Training Acknowledgement:

Employees print name, sign and date in spaces provided below.

PRINT NAME	SIGNATURE	DATE

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: General Procedures & Mobilization **Date: October 2019**
Project: Tonawanda Coke **Revision:**

Work Plan Summary: Standard procedures & administrative controls

PREREQUISITES		
EQUIPMENT TO BE USED/SITE ENTRY	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
Project specific equipment: excavators and/or loaders, skid steers, forklifts, dozers, aerial lift	All equipment shall be inspected before use per manufacturer's specification. Inspections shall be documented and maintained on site.	Any equipment operator must be OSC certified competent for each specific class of equipment.
PPE: Hard hat, safety glasses w/side shield, safety shoes with boot covers or rubber over boots in wet conditions, gloves, including barrier/nitrile, hearing protection, splash shield as needed, coated disposable coveralls	PPE shall be inspected daily.	Per OSC HASP

ACTIVITY	POTENTIAL HAZARD	PROTECTIVE METHODS AND CONTROLS
General Construction Related Activities (see task specific AHA for detailed procedures)	Lack of training	• All site workers will have completed OSHA 40-hour HAZWOPER training with yearly updates. • Worker will be trained prior to performing new activities. • OSC will hold daily tailgate safety meetings prior to starting each shift. • New employees will be assigned a mentor per OSC Short Service Employee Program
	Stress/strain when lifting	• Workers will be instructed in safe lifting techniques (i.e., back straight, bend at knees, load close to body, lift smoothly, and do not twist. • Workers will utilize material handling devices such as forklifts, come-along, etc. • Two workers will be required for manual lifts of **over 50 pounds**. • Workers are encouraged to get help with any lift that appears excessive or awkward. • Split heavy loads into smaller loads whenever possible. • Make sure the path of travel is clear prior to the lift.
	Refueling of equipment	• Shutdown equipment during refueling. • Allow equipment to cool down before refueling. • Refuel from OSHA-compliant portable fuel container. • Personnel performing the refueling operation will exercise caution to avoid spillage. • Spill kits will be kept near the refueling operations. • A 10 lb. (minimum) fire extinguisher will be located in the immediate area during refueling operations.
	Injuries associated with hand tools	• Tools shall be carried in a safe and proper manner. • Tools shall not be carried up a ladder by hand; tools should be raised or lowered in a tool bag. • Defective tools shall be tagged immediately and removed from service. • Tools shall be used correctly and only for their intended purpose. • Hand tools to be inspected for mushroomed heads, broken/cracked handles, or loose heads prior to use. • Clean tools after every use when used in the regulated area to minimize contamination
General Construction Related Activities (see task specific AHA for detailed procedures)	Injuries associated with power tools	• Worker will inspect tools and electrical cords before use. • Defective tools will be tagged and removed from service. • A GFCI will protect all electrical cords and tools. • Portable generators of 5kW or larger, if used, will be grounded. • Electrical tools shall be unplugged when changing attachments or performing maintenance. • Electric tools with missing ground prongs, cut or frayed cords shall be removed from service. • Electric tools used in highly conductive locations, such as where employees may contact water, shall be approved for use in these locations. • Pneumatic tools shall be disconnected, and air pressure released before repairs are made. • Extension cords shall be inspected prior to and after use. Damaged cords will be tagged and taken out of service.

	Heavy equipment operations	• Operators are to know where the operations manual is kept for each piece of machinery they will use (typically in job trailer). • Operators will inspect machinery before use and complete the Daily Inspection checklist. • All operators will be certified for equipment operation. • Use three-point contact when climbing onto equipment. • All heavy equipment will be equipped with a functional backup alarm. • Operators will be instructed to maintain visual contact with personnel working in the immediate equipment area. • Passengers will be prohibited from equipment. • Seat belts shall be used in accordance with manufacturer's specifications. • Fire extinguishers will be mounted on all equipment. • Hearing protection will be worn by equipment operators when working in open cab equipment, or when doors/windows are open.	
	Chemical exposure	• SDSs are required for all chemicals brought to the site. • The SDS book will be kept at the field office trailer and will be available to all employees.	
	Tick exposure (Lyme disease)	• Use Permethrin on clothing and exposed skin. Keep skin, especially legs, covered. • Check clothing after being in woods for ticks. Wear light colored clothing to help spot ticks. • Look for ticks attached to skin and report immediately. Ask for removal instructions. • Shower after work and check whole body for ticks. Put clothing in dryer on hi heat for 10 min. • After a bite be aware of any rash (bulls' eye), fever, chills. Report immediately.	
	Airborne dust exposure	• OSC will use wet methods when activities occur to prevent airborne dust from being generated or when visible dust has been generated. If dust become visible, workers will notify the supervisor. • Workers will work-up wind whenever intrusive activities occur to minimize exposure (body or inhalation) to airborne dust. • Workers are to follow good hygiene procedures to prevent skin exposure and to prevent incidental ingestion of any contaminated materials.	
	Ingestion exposure	• Wear barrier gloves (nitrile or latex) when working with contaminated soil, hardware, equipment, or water. • Replace torn or damaged gloves immediately. Use proper technique when removing contaminated gloves • Always wash face and hands before eating, drinking or touching the mouth area.	
	Medical emergencies	• Maintain at least one person on each shift who has first aid, cardiopulmonary resuscitation and bloodborne pathogens training. • Ensure radio or phone communications capabilities area available to summon emergency response or report spills/ releases. • Ensure all personnel are familiar with emergency procedures and egress routes. • For emergency call 911	

OSC	**ACTIVITY HAZARD ANALYSIS (AHA)**

Special Notes and Instructions: This AHA shall be reviewed by all project employees prior to commencing work and as warranted by; AHA revisions, safe work observations and improvement measures. All employees have the authority to stop work for safety concerns.

AHA Review and Training Acknowledgement:

Employees print name, sign and date in spaces provided below.

PRINT NAME	SIGNATURE	DATE

ACTIVITY HAZARD ANALYSIS (AHA)
Grading & Compacting

Activity: Grading & Compacting

Date: October 2019
Revision:

PREREQUISITES		
EQUIPMENT & TOOLS TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING & PERMIT REQUIREMENTS**
Off-road truck Dozer Water truck Excavator PPE: per HASP	Daily heavy equipment inspection prior to operation. Complete and turn in OSC inspection form to site safety or superintendent. Deficiencies must be corrected prior to operation. Inspect all PPE equipment and extinguishers prior to operation/work.	Employee must be trained in proper use of powered equipment per MFG guidelines, OSC authorized & competent, and meet HASP training requirements.

ACTIVITY	POTENTIAL HAZARD	PROTECTIVE METHODS AND CONTROLS
Inspecting equipment	• Pinch point • Fall • Eye exposure • Animal bite	• Level D PPE including gloves, hard hat, safety glasses with side shields • Maintain 3-points of contact. Use ladder if necessary • Make noise and strike machine before putting hands in tight spaces • Lubrication & fuel use per products SDS

ACTIVITY HAZARD ANALYSIS (AHA)
Grading & Compacting

ACTIVITY	POTENTIAL HAZARD	PROTECTIVE METHODS AND CONTROLS
Compacting/grading	• Line strike • Struck by/crush • Pinch • Fall • Inhaling dust • Collision	• Do not break ground until buried lines have been identified and verified by owner/operator • Stay clear of operating machines and make eye contact with operator when entering line-of-fire • Watch hand placement • Use three points of contact • Alert superintendent/safety if dust becomes excessive • Spot for trucks & machines when blind spots are present. Use high vis-vest • Use caution on slopes, do not allow trucks to dump on unlevel ground, use spotter while grading when necessary
Dust suppression using water truck	• Propelled debris • Splashing • Roll over • Slips • Rolling truck	• Watch for people on foot. They have the right of way. • Don't spray people or vehicles • Use low speed • Use caution when walking on wet muddy surfaces, • Walk area before driving into high grass or when surface isn't visible • Remove key from truck while filling and chock wheels

Special Notes and Instructions: This AHA shall be reviewed by all project employees prior to commencing work and as warranted by; AHA revisions, safe work observations and improvement measures. All employees have the authority to stop work for safety concerns.

AHA Review and Training Acknowledgement:

Employees print name, sign and date in spaces provided below.

PRINT NAME	SIGNATURE	DATE

ACTIVITY HAZARD ANALYSIS
Sediment Control

ACTIVITY: Sediment control
PROJECT: Tonawanda Coke
Date: October 2019
Revision: 0

WORK PLAN SUMMARY: Trench, install, and back fill silt fence, install filter sock, put in stakes

PREREQUISITES		
EQUIPMENT TOOLS TO BE USED	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
Ditchwitch trencher	OSC pre-use inspection	OSC designated competency
Mini excavator	OSC pre-use inspection	OSC designated competency
Hand tools	Visual inspection	
Skid steer	OSC pre-use inspection	OSC designated competency
Mapping		

ACTIVITY/STEP	POTENTIAL HAZARD	PROTECTIVE AND CONTROL MEASURES
Haul material to specific location on site with skid steer	• Pinch points • Struck by / Line of Fire • Slips trips and falls • Loss of elevated load / Rollover • Injury due to lack of training • Equipment noise • Equipment fires • Blind spot injuries • Struck by from excavator • Swing radius • Inclement weather	• Communication between Ground crew and equipment operator • Body placement / know your surroundings / Eye Contact with operator - bucket or blade is locked out and secured. • Seatbelts to be used to manufacturers specifications at all time. No cell phone use or texting at any time while operating equipment. • 3 points of contact to enter - exit equipment • Maintain lowest possible lift prior to travel • OSC operators to be certified / evaluated prior to equipment operation – Certs will be submitted to Honeywell / Jacobs • Hearing protection will be worn by operators in open cab equipment or when doors and windows are propped in the open position • Fire Extinguishers to be equipped and certified in all equipment with monthly Inspections. Additional ABC 20 lb. fire Extinguisher shall be placed near the work area. Monthly inspections to be completed and reviewed • Eye contact and communication with equipment operator and utilize equipment spotter when necessary. Functional backup alert system on all equipment required • Manage non-essential / untrained personnel from entering the swing radius of any moving equipment • Refer to AHA General

ACTIVITY HAZARD ANALYSIS

Sediment Control

ACTIVITY/STEP	POTENTIAL HAZARD	PROTECTIVE AND CONTROL MEASURES
Trenching, digging, hand clearing surfaces for silt fence	• Buried utilities • Equipment failure • Property damage • Obstacles • Subsurface structures, findings • Line of fire • Swing radius • Uneven terrain • Trip hazards • Open trench • Pedestrians • Communication	• ALL PARTIES MUST REVIEW AND UNDERSTAND UTILITY MARK OUT REPORT BEFORE ANY SUBSURFACE WORK BEGANS • Daily Inspection performed before use – while in operation operators will monitor, gauges, and look for indications of failure to hydraulic hoses and guards • Stay clear of all heavy equipment in your work area. If you can relocate do so, until work is complete • Use spotters when the operator's visibility is impaired, or equipment is approaching congested areas or blind corners. As needed. • Review the Blood hound utility information – if the trencher or mini E • Keep clear of moving parts on equipment stay clear of chance of flying debris or line of fire • Do not stand directly in front of the trencher or either side follow all operating • If the chain needs to be cleaned with a shovel shut off the trencher and lock it out • Keep 20 ft away from any part of the equipment • Plan your path, make sure you have proper footing before carrying or walking in uncleared areas • Pick up your feet walk with purpose, remove any trip hazards needed to be safe • Secure your work area with a delineated barrier or spotter to keep unauthorized personnel out • Personnel not covered under the AHA are not permitted in the work area • Use your radios, keep everyone aware of upcoming hazards you have prepared for during your task.
Installing silt fence	• Splinters • Pinch points • Sprains and strains • Ergonomics • Trip hazards • punctures • Tight/remote areas • Damaged materials • Biologicals	• Wear leather gloves while handling wooden stakes • Watch hand placement when swinging hammer to post • Position yourself correctly with firm grip on hammer • Keep feet planted firmly use fabric to hold stake in place • Again, plan your path keep footing clear while carrying materials or tools • Stakes have pointed edges keep them away from your body and keep points to the ground • Give yourself as much space as possible when swinging hammer if area is congested take small swings with the hammer • Weathered or rotten stakes may be in your bundle please keep an eye out for them replace when needed or discard bundle and notify supervisor immediately

ACTIVITY HAZARD ANALYSIS

Sediment Control

ACTIVITY/STEP	POTENTIAL HAZARD	PROTECTIVE AND CONTROL MEASURES
Backfilling trench line/burying silt fabric	• Incorrect install • Sprains and strains • Dehydration • Trips and falls • House keeping	• Make sure the silt fence stakes are installed correctly, water flow goes against the fabric then stakes are driven behind • Proper ergonomics when shoveling fill material back into trench, use equipment properly and when possible let the machine do the work • Take breaks make sure you stay hydrated, watch out for your fellow man ask when the last time was you had a water. • Keep all tools and equipment clear and free of debris, your work area must be clutter free as well. Housekeeping is a must with all task
Refueling Equipment	• Ignition source • Fire • Leaks due to faulty container • Slips, Trips, Falls • Spills	• Shutdown equipment during refueling. • Allow equipment to cool down before refueling. • Refuel from OSHA-compliant portable fuel container. • Personnel performing the refueling operation will exercise caution to avoid spillage. • Spill kits will be kept near the refueling operations. • Prior to fueling, personnel shall bond the heavy equipment to fueling equipment. • A minimum 10 lb. (minimum) fire extinguisher will be located in the immediate area during refueling • Spill kit

ACTIVITY HAZARD ANALYSIS
Sediment Control

SPECIAL NOTES AND INSTRUCTIONS: This AHA shall be reviewed by all project employees prior to commencing work and as warranted by; AHA revisions, safe work observations and improvement measures. All employees have authority to stop work for safety concerns.

AHA REVIEW AND TRAINING ACKNOWLEDGEMENT

DATE	NAME	SIGNATURE

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Soil/debris loadout **Date: October 2019**
Project: Tonawanda Coke **Revision:**

Work Plan Summary: Load soil material into trucks for off-site disposal

PREREQUISITES		
EQUIPMENT TO BE USED/SITE ENTRY	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
Excavators equipped with bucket	All equipment shall be inspected before use per manufacturer's specification. Inspections shall be documented and maintained on site.	Any equipment operator must be OSC certified competent for each specific class of equipment.
Over-the-road haul trucks (subcontractor). Trucks to be equipped with ground level tarping system and pre-lined	Trucks shall be inspected before leaving site for lose material that may become dislodged off site.	Each driver upon initial site entry shall be instructed on safety requirements, signals, and traffic controls
PPE: Hard hat, high visibility clothing, safety glasses w/side shield, safety shoes with boot covers or rubber over boots in wet conditions, gloves, hearing protection.	PPE shall be inspected daily.	PPE basic training

	ACTIVITY HAZARD ANALYSIS (AHA)

ACTIVITY	POTENTIAL HAZARD	PROTECTIVE METHODS AND CONTROLS
Truck arrives on-site and goes through bed lining inspection	Collision with object Collision with pedestrian Driver distraction/injury Liner not installed properly Fall	• Site shall be laid out in advance for truck maneuvering and traffic controls • All site personnel shall have hi-visibility clothing • Driver shall be instructed on site rules; remain in truck except designated area, PPE, signals • OSC to inspect bed for proper liner installation • Maintain 3-points of contact on ladder during inspection
Truck loading	Collision with object Material spill	• Spotter to direct truck as needed (i.e., blind spot, tight maneuvering/quarters) • Excavator operator to signal truck for correct position and when load is completed
Truck tarping	Fall Struck by	• Only ground-level tarp system to be used. Driver to maintain 3-points of contact entering & exiting cab. • Tarping and pre-departure inspection only to be done in designated area •
		•

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AHA Review and Training Acknowledgement:

Employees print name, sign and date in spaces provided below.

PRINT NAME	SIGNATURE	DATE

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Tank Demolition
Project: Tonawanda Coke

Date: August 2019
Revision: 1

Work Plan Summary: Activities, hazards and associated hazard control with respect to the cleaning and demolition of storage tanks

PREREQUISITES		
EQUIPMENT TO BE USED/SITE ENTRY	**INSPECTION REQUIREMENTS**	**TRAINING REQUIREMENTS**
Project specific equipment: excavators equipped with mechanical shears & grapple. Hand saw for cold cuts, propane torch for hot cutting.	All equipment shall be inspected before use per manufacturer's specification. Inspections shall be documented and maintained on site. Hot Work Permit if burning.	Any equipment operator must be OSC certified competent for each specific class of equipment.
Aerial lifts. Users to be equipped with fall restraint.	Pre-use inspection (daily) per manufacturer	Per manufacturer on lift. Fall protection.
PPE: Hard hat, high visibility clothing, safety glasses w/side shield, safety shoes with boot covers or rubber over boots in wet conditions, gloves, hearing protection. For power washing will upgrade to coated disposable coveralls, rubber boots, nitrile gloves, and face shield w/goggles	PPE shall be inspected daily.	PPE basic training
4-gas MultiRAE lite Fire extinguisher	Unit must be calibrated per manufacturer	Per manufacturer

ACTIVITY	POTENTIAL HAZARD	PROTECTIVE METHODS AND CONTROLS
Work zone preparation	Slips, trips, and falls Vermin Struck by Inhalation contaminates Skin contact	• Walk work area slowly and without distraction. • In high vegetation use stick to probe ahead. Remain upright and make noise. • Delineate work zone and mark out traffic patterns. Use spotters. • Monitor tank air for VOCs per HASP • Use barrier gloves (w/leather) when handling contaminated material
Fueling of equipment	Splash Burns Fire Spill	• Use face shield with PPE • Shutdown equipment during refueling. • Allow equipment to cool down before refueling, refuel from OSHA-compliant container. Have fire extinguisher (10 lb. minimum) available. • Spill kits will be kept near the refueling operations.
Cold cut openings in tank roof from aerial for shear access	Fall from basket Shock Vapor inhalation/explosion Hand injury Debris in eye Noise exposure Dropped items	• Use fall restraint (harness with tether). Do not lean outside of basket. Keep feet on platform • Assure power tool is grounded and plugged to GFCI. Check electric power cord. No work within 10-feet of overhead power lines • Monitor tank for LEL and VOC levels. See HASP for action limits. • Use leather gloves. Tie off cord to relieve weight. • Use face shield and safety glasses with side shields • Use hearing protection • Barricade area below aerials. Tie off hand tools to basket.

Hot torch cutting (propane) tank roof and sides	Fall from basket Burn Vapor inhalation/explosion Noise exposure Dropped items Fire	• Use fall restraint (harness with tether). Do not lean outside of basket. Keep feet on platform • Wear leathers (jacket, gloves, outer flame-resistant coveralls) PPE. Use flash suppressor/back flow preventer. Fuel cylinders shall be properly stored (cart) and handled. • Monitor tank for LEL and VOC levels every 30 min. Assure water blanket covers all of coal tar tank contents. Surface water must be tested for flashpoint prior to torching • Use hearing protection. Barricade area below aerials. Tie off hand tools to basket. • Fire watch must be on station. Fire extinguisher immediately available. Water truck must be placed at the hot work site and spray hose manned at all times by fire watch during burning. • Fire watch and water truck will remain on station for 30 minutes after hot work is complete • Personnel in man basket performing torch cutting operations will be in FRC (Flame Resistant Clothing) at all times during hot work operations.
Shear cut tank using excavators	Struck by Fire/explosion Dropped items/hydraulic failure Noise exposure	• Maintain eye contact with operator, do not approach within 35-feet, use spotters • Before shearing check interior tank atmosphere for LEL • Never get below boom/stick, stay outside swing radius. Do not approach until load is on ground or decontamination pad • Use hearing protection near excavators. Operators use hearing protection if doors/windows of cab are opened

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AHA Review and Training Acknowledgement:

Employees print name, sign and date in spaces provided below.

PRINT NAME	SIGNATURE	DATE

ATTACHMENT III: Safety Data Sheets

Safety Data Sheet (SDS)

Date Prepared/Revised: 1/6/2015 Version no.: 02 Supersedes: (9/11/2014)

1.) Identification of the Mixture and of the Company

Product identifier**: Aervoe Construction Marking Paint - Aerosol**

Product name: **Construction Marking Paint**

Fluorescent Colors	Non-Fluorescent Colors	16 oz. I.A.C.
246 Red 247 Orange 248 Green 249 Pink 250 Blue 253 Yellow 283 Red-Orange	251 Black 252 Yellow 254 Blue 255 White 256 Red 257 Orange 258 Hi Vis Yellow 259 Green 260 Purple	261 Red 262 Yellow 263 Blue 265 Orange 267 White 270 Fluorescent Red 272 Fluorescent Orange 274 Fluorescent Green 275 Fluorescent Red/Orange 279 Fluorescent Pink

Relevant identified uses of the substance: Designed to adhere to most surfaces, including pavement, gravel, and soil.
Uses advised against: Do not apply if surface is wet, or if rain is imminent within 4 hours of application.

CAS No:	**Not Applicable (mixture)**
EC No:	**Not Applicable (mixture)**
Index No:	**Not Applicable (mixture)**
Manufacturer/Supplier:	**Aervoe Industries Incorporated**
Street address/P.O. Box:	**1100 Mark Circle**
Country ID/Postcode/Place	**Gardnerville, Nevada 89410**
Telephone number:	**001 (0) 1-775-782-0100**
e-mail:	**mailbox@aervoe.com**
National contact:	**Aervoe Industries Incorporated**
For Product Information:	00**1 (0) 1-800-227-0196**
Emergency telephone number:	**001 (0) 1-800-424-9300 (CHEMTREC – 24 hrs)** **English Language Service**

2. Hazards identification

Classifications

Physical Hazards:	Aerosol - Category 1 Flam. Gas. 1 Press. Gas Flam. Liq. 2
Health Hazards:	Car 1B Muta 1B Asp Tox. 1

Eye Irrit. - 2
Rep. 2
Skin. Irr. 2
STOT SE3

Environmental Hazards: Aquatic Chronic 2

Labeling

Signal Word: Danger

Hazard Statements:
H220 – Extremely flammable gas
H222 – Extremely flammable aerosol
H225 – Highly flammable liquid and vapour.
H229 - Pressurized container: may burst if heated
H304 – May be fatal if swallowed and enters airways.
H315 – Causes skin irritation.
H319 – Causes serious eye irritation.
H336 – May cause drowsiness or dizziness.
H340 – May cause genetic defects
H350 – May cause cancer
H361 – Suspected of damaging fertility or the unborn child .
H373 – May cause damage to organs through prolonged or repeated exposure
H411 - Toxic to aquatic life with long lasting effects

Precautionary Statements:
P101 - If medical advice is needed, have product container or label at hand
P102 - Keep out of reach of children
P103 - Read label before use
P210 - Keep away from heat/sparks/open flames/hot surfaces - no smoking
P211 - Do not spray on an open flame or other ignition source
P251 - Pressurized container: Do not pierce or burn, even after use
P261 - Avoid breathing dust/fume/gas/mist/vapours/spray
P262 - Do not get in eyes, on skin, or on clothing
P264 - Wash … thoroughly after handling
P280 - Wear protective gloves/eye protection/face protection

P303+P361+P353 - If on skin or hair, remove/takeoff immediately all contaminated clothing. Rinse skin with water/shower.
P410+P412 - Protect from sunlight. Do not expose to temperatures exceeding 50ºC/122ºF
P501 - Dispose of contents/container in accordance with local/regional/national/international regulation

Date Prepared/Revised: 1/6/2015 Version no.: 02 Supersedes: (9/11/2014)

Symbols/Pictograms:

3. Composition / Information on Ingredients

Composition

Chemical	Synonyms	CAS Number	EINECS Number	Weight Percent	Hazard Category	H-Code
Hydrocarbon Propellant	LPG	68476-86-8	270-705-8	10-30%	Press. Gas Flam. Gas 1 Carc. 1B Muta. 1B	H220 H350 H340
Hexane	n-Hexane	110-54-3	203-777-6	5-10%	Flam. Liq. 2 Repr. 2 Asp. Tox. 1 STOT RE 2 * Skin Irrit. 2 STOT SE 3 Aquatic Chronic 2	H225 H361f *** H304 H373 ** H315 H336 H411
Aliphatic Petroleum Distillates	Solvent Naphtha	64742-89-8	265-192-2	5-10%	Carc. 1B Muta. 1B Asp. Tox. 1	H350 H340 H304
Aliphatic Petroleum Distillates	Solvent Naphtha	64742-88-7	265-191-7	1-5%	Asp. Tox. 1	H304
Aliphatic Petroleum Distillates	Solvent Naphtha	8032-32-4	232-453-7	1-5%	Carc. 1B Muta. 1B Asp. Tox. 1	H350 H340 H304
Non-fluorescent colors also contain:						
Acetone	Propanone	67-64-1	200-662-2	1-5%	Flam. Liq. 2 Eye Irrit. 2 STOT SE 3	H225, H319, H336

Other Product Information

Chemical Identity: Mixture

4.) First Aid Measures

General Advice:	If symptoms persist, always call a doctor.
Inhalation First Aid:	Remove victim to fresh air and provide oxygen if breathing is difficult. If not breathing, give artificial respiration, preferably mouth to mouth. Get medical attention immediately.
Skin Contact First Aid:	Wash with soap and water. Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse.
Eye Contact First Aid:	If contact with eyes, immediately flush eyes with plenty of water for at least 15 minutes, while holding eyelids open. Get medical attention immediately.
Ingestion First Aid:	If swallowed, wash out mouth with water provided the person is conscious. Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Most Important Symptoms/Effects:	Exposure may cause slight irritation to the skin, eyes, and respiratory tract. Excessive exposure may cause central nervous system effects.

5. Fire Fighting Measures

Flammable Properties:	Aerosol
Auto Ignition Temperature:	Not Available
Suitable extinguishing media:	Carbon dioxide, dry chemical, water spray.
Unsuitable extinguishing media:	None known
Special hazards arising from the substance or mixture:	None known
Hazardous combustion products:	Carbon dioxide, Carbon monoxide
Fire & Explosion Hazards:	Closed Containers may rupture due to the buildup of pressure from extreme temperatures.
Precautions for fire-fighters:	Use water spray to cool containers exposed to heat or fire to prevent pressure build up. In the event of a fire, wear full protective clothing and NIOSH- approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

PERSONAL PRECAUTIONARY MEASURES:

1) Follow personal protective equipment recommendations found in section 8.
2) Maintain adequate ventilation.

SPILL CLEAN-UP PROCEDURES:
1.) Evacuate unprotected personnel from the area.
2.) Remove sources of ignition if safe to do so.
3.) Pickup spilled materials using non-sparking tools and place in an appropriate container for disposal.
4.) Contain spill to prevent material from entering sewage or ground water systems.
5.) Always dispose of waste materials in accordance with all EU, National and Local Regulations.

7. Handling and Storage

Handling:

Flammable Aerosol, use in a well ventilated area.
Do not use near sources of ignition.
Do not to eat, drink and smoke while working with this material.
Wash hands after use.

Conditions for safe storage, including any incompatibilities:

Store out of direct sunlight.
Storage Temperature: 32° to 120°F (0° to 49°C).
No known incompatibilities.

8. Exposure Controls / Personal Protection

Appropriate engineering controls:
Ensure adequate ventilation. A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits.
Keep away from sources of ignition.
Take precautionary measures against static discharge.

Personal Protection:
Eye & face protection devices such as safety glasses, safety goggles or face shield are recommended.

Skin protection
Wear the appropriate protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection:
Use only in an adequately ventilated area. For unknown vapor concentrations use a positive-pressure, pressure-demand, self-contained breathing apparatus (SCBA).

Hazardous Ingredient	CAS Number	ACGIH TLV (TWA)	ACGIH TLV (STEL)	OSHA PEL (TWA)	OSHA PEL (STEL)

Aliphatic Petroleum Distillates	64742-88-7	N/AV	N/AV	N/AV	N/AV
Aliphatic Petroleum Distillates	64742-89-8	N/AV	N/AV	N/AV	N/AV
Hydrocarbon Propellant	68476-86-8	N/AV	N/AV	N/AV	N/AV
Aliphatic Petroleum Distillates	8032-32-4	200ppm	300ppm	200ppm	N/AV
Hexane	110-54-3	50ppm	N/AV	500ppm	N/AV
Acetone	67-64-1	500ppm	750ppm	1000ppm	N/AV

***Values are based on the 2014 Guide to Occupational Exposure Values by ACGIH**

9. Information on Basic Physical and Chemical Properties

Appearance: Color varies by product.	Odor: Hydrocarbon Odor
Odor Threshold: N/AV	pH: Not Applicable (solvent Base)
Melting Point: N/AV	Freezing Point: N/AV
Initial Boiling Point: N/AV	Boiling Point Range: N/AV
Flash Point: <0° F (-18° C)	Evaporation Rate: Faster than n-Butyl Acetate
Flammability Solid/Gas: Flammable gas	LEL: 0.9% UEL: 13%
Vapor Pressure: N/AV	Vapor Density: Heavier Than Air
Relative Density: N/AV	Solubility: Negligible
Partition Coefficient: n-octanol/ water: N/AV	Auto-ignition Temperature: N/AV
Decomposition Temperature: N/AV	Viscosity: N/AV
Explosive Properties: N/AV	Oxidizing Properties: N/AV

10. Stability & Reactivity

Possibility of hazardous reactions: Hazardous polymerization will not occur under normal conditions
Chemical stability: Stable under normal conditions
Conditions to avoid: Heat and ignition sources
Incompatible materials: Strong Oxidizing Agents
Hazardous decomposition products: Will not occur

11. Toxicological Information

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage. Repeated overexposure can also damage kidneys, lungs, liver, heart and blood

Routes of exposure: Eyes, skin, ingestion, and/or inhalation

Acute toxicological data: (Acetone) Acute oral LD50: 5800mg/kg(rat)

	(Acetone) LC50: 21000 ppm / 8 hr (rat) (Hexane) LD50: 2870 mg/kg (Rat-Oral)
Eye irritation data:	N/AV
Skin irritation/sensitization/absorption data:	N/AV
Reproductive toxicity data:	N/AV
Mutagenicity data:	Muta 1B
Symptoms associated with physical contact:	N/AV
Acute/chronic effects from short/long term exposure:	Irritating to skin. Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis. Not expected to be a skin sensitizer.
Known reportable carcinogens via the following agencies:	
NTP:	N/AV
IARC:	IARC3:Classification not possible from current data
OSHA:	TLV-A4

* Petroleum distillates may contain chemical carcinogens in limited quantities (< 0.01%). These quantities are determined by the supplier/fraction/purity of the distillate during the manufacturing process. Chemicals that may be present within distillates are listed on California's prop 65 list such as ETHYLBENZENE, BENZENE, and TOLUENE.

12. Ecological Information

Ecotoxicity: **No Data Available**
Persistence and degradability: **No Data Available**
Bioaccumulative potential: **No Data Available**
Mobility in soil: **No Data Available**
Results of PBT and vPvB assessment: **No Data Available**
Other adverse effects: **No Data Available**

13. Disposal Considerations

Waste Disposal: Dispose of material in accordance with EU, national and local requirements. For proper disposal of used material, an assessment must be completed to determine the proper and permissible waste management options permitted under applicable rules, regulations and/or

laws governing your location.
Product / Packaging disposal: Dispose of packaging in accordance with federal, state and local requirements, regulations and/or laws governing your location.

14. Transportation Information

US DOT

UN Number	Proper Shipping Name	Hazard Class	Packing Group	Marine Pollutant	Special Provisions
UN1950	Aerosols	2.1	Not Applicable	Not Applicable	Reference 49 CFR 172.101

IMDG

UN Number	Proper Shipping Name	Hazard Class	Packing Group	Marine Pollutant	Special Provisions
UN1950	Aerosols	2.1	Not Applicable	Not Applicable	Reference IMDG code part 3

IATA:

UN Number	Proper Shipping Name	Hazard Class	Packing Group	Marine Pollutant	Special Provisions
UN1950	Aerosols, Flammable	2.1	Not Applicable	Not Applicable	Reference IATA Dangerous Goods Regulation

15. Regulatory Information

Workplace classification:
This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200). The Occupational Safety and Health Administration's interpretation of the product's hazard to workers.
SARA Title 3:
Section 311/312 Categorizations (40 CFR 372): This product is a hazardous chemical under 29 CFR 1910.1200, and is categorized as an immediate and delayed health, and flammability physical hazard. Superfund Amendment and Reauthorization Act (SARA) category. SARA requires reporting any spill of any hazardous substance.
TSCA status: All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.
WHMIS: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the (M)SDS contains all of the information required by the CPR.
PROP 65 (CA): WARNING: This product may contain chemicals know to the state of California to cause cancer, birth defects or other reproductive harm.

16. Other Information

Safety Data Sheet (SDS)

Date Prepared/Revised: 1/6/2015 Version no.: 02 Supersedes: (9/11/2014)

This SDS has been completed in accordance with GHS Rev04 (2011): U.S OSHA, CMA, ANSI, Canadian WHMIS standards, and European Directives.

Date of Preparation/Revision: 1-6-2015
Supersedes: (9/11/2014)

To the best of our knowledge, the information contained herein is believed to be accurate. However, the above data does not imply any guarantee or warranty of any kind, expressed or implied. The final determination of the suitability of any material is the sole responsibility of the user. All materials made present un-known hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee these are the only hazards existing.

Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909
US GHS

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

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

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

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

* * * Section 2 - Hazards Identification * * *

GHS Classification:

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

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

DANGER

Hazard Statements

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

Precautionary Statements

Prevention

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

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

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

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

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

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

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

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

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

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

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

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

First Aid: Inhalation

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

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

General Fire Hazards

See Section 9 for Flammability Properties.

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

Hazardous Combustion Products

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

Extinguishing Media

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

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

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

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

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

Recovery and Neutralization

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

Materials and Methods for Clean-Up

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

Emergency Measures

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

Personal Precautions and Protective Equipment

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

Environmental Precautions

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

Prevention of Secondary Hazards

None

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

Handling Procedures

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

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

Storage Procedures

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

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

Incompatibilities

Keep away from strong oxidizers.

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

Component Exposure Limits

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

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

Naphthalene (91-20-3)

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

Engineering Measures

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

Personal Protective Equipment: Respiratory

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

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

Personal Protective Equipment: Hands

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

Personal Protective Equipment: Eyes

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

Personal Protective Equipment: Skin and Body

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

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

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

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

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

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

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

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

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Naphthalene (91-20-3)

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

Potential Health Effects: Skin Corrosion Property/Stimulativeness

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

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

Potential Health Effects: Ingestion

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

Potential Health Effects: Inhalation

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

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

Respiratory Organs Sensitization/Skin Sensitization

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

Generative Cell Mutagenicity

This material has been positive in a mutagenicity study.

Carcinogenicity

A: General Product Information

Suspected of causing cancer.

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

B: Component Carcinogenicity

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

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

Naphthalene (91-20-3)

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

Reproductive Toxicity

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

Specified Target Organ General Toxicity: Single Exposure

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

Specified Target Organ General Toxicity: Repeated Exposure

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

Aspiration Respiratory Organs Hazard

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

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

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

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

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

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

Naphthalene (91-20-3)

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

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

Persistence/Degradability
No information available.

Bioaccumulation
No information available.

Mobility in Soil
No information available.

* * * Section 13 - Disposal Considerations * * *

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

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

* * * Section 14 - Transportation Information * * *

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

* * * Section 15 - Regulatory Information * * *

Regulatory Information

Component Analysis

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

Naphthalene (91-20-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

SARA Section 311/312 – Hazard Classes

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

SARA SECTION 313 - SUPPLIER NOTIFICATION

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

State Regulations

Component Analysis - State

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

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

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

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

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Additional Regulatory Information

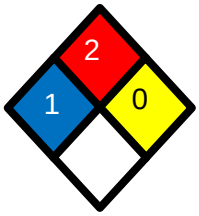
Component Analysis - Inventory

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

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	1
Fire	2
Reactivity	0



HMIS® Hazard Rating

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

Key/Legend

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

Literature References

None

Other Information

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

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

End of Sheet

EnviroBlend Metal Waste Treatment

SAFETY DATA SHEET

Issue Date 02-Dec-2014 **Revision Date** 20-April-2017 **Version** 1

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name ENVIROBLEND® SP

Other means of identification

Product Code ENVIROBLEND® SP

Synonyms None

Recommended use of the chemical and restrictions on use

Recommended Use Heavy metals remediation product.

Uses advised against No information available

Details of the supplier of the safety data sheet

Manufacturer Address

Premier Magnesia, LLC, 75 Giles Place, Waynesville, NC 28786

Emergency telephone number

Company Phone Number 828-452-4784

24 Hour Emergency Phone Number Chemtrec 1-800-424-9300

Emergency Telephone Chemtrec 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status

Product dust is classified as a "nuisance particulate, not otherwise regulated" as specified by ACGHI and OSHA. The excessive, long-term inhalation of mineral dusts may contribute to the development of industrial bronchitis, reduced breathing capacity, and may lead to the increased susceptibility to lung disease. This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.122)

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Label elements

Emergency Overview

The product contains no substances which at their given concentration, are considered to be hazardous to health

Appearance Granular **Physical state** Solid **Odor** Odorless

Causes mild irritation to the eyes
Low toxicity by skin contact.
Chronic overexposure by inhalation of airborne particulate may irritate upper respiratory system as well as the throat.
Ingestion is an unlikely route of exposure. If ingested in large amounts it may cause irritation, nausea, vomiting, diarrhea, abdominal pain, black stool, pink urine, coma and possibly death.

Hazards not otherwise classified (HNOC)

Other Information

Unknown Acute Toxicity 100% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Common name Magnesium Oxide # 1309-48-4/Magnesium Carbonate CAS# 546-93-0
Synonyms None

Chemical Name	CAS No.	Weight-%	Trade Secret
Magnesium Oxide/Magnesium Carbonate	1309-48-4/546-93-0	50/50	

4. FIRST AID MEASURES

First aid measures

Eye contact Rinse thoroughly with plenty of water, also under the eyelids. (Get medical attention immediately if irritation persists.).

Skin Contact Wash skin with soap and water.

Inhalation Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately.

Ingestion Not an expected route of exposure. Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person. Do not induce vomiting without medical advice. Immediate medical attention is required.

Most important symptoms and effects, both acute and delayed

Symptoms No information available.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media Water reacts with magnesium oxide producing magnesium hydroxide and heat. Do not allow water to get inside containers: reaction with water will cause product to swell, generate heat, and burst its container. If contact is unavoidable, use sufficient water to safely absorb the heat that may be generated.

Specific hazards arising from the chemical
No information available.

Explosion data
Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge None.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation, especially in confined areas.

Environmental precautions

Environmental precautions See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Carefully clean up and place material into a suitable container, being careful to avoid creating excessive dust. If conditions warrant, clean up personnel should wear approved respiratory protection, gloves and goggles to prevent irritation from contact and/or inhalation.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Use personal protective equipment as required.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed in a dry and well-ventilated place. Avoid generation of dust. Do not allow contact with water.

Incompatible materials Interhalogens, bromine pentafluoride, chlorine trifluoride. Contact with aluminum metal may release hydrogen gas. Incandescent reaction wtih phosphorus pentachloride. Water will react with magnesium oxide to form magnesium hydroxide and release heat and steam.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Magnesium Oxide 1309-48-4	TWA: 10 mg/m³ inhalable fraction	TWA: 15 mg/m³ fume, total particulate (vacated) TWA: 10 mg/m³ fume and total particulate	IDLH: 750 mg/m³ fume

NIOSH IDLH Provide workers with NIOSH approved respirators in accordance with requirements of 29 CFR 1910. 134 for level of exposure incurred.

Appropriate engineering controls

Engineering Controls Provide sufficient ventilation, in both volume and air flow patterns to control mist/dust concentrations below allowable exposure limits. Showers. Eyewash stations.

Individual protection measures, such as personal protective equipment

Eye/face protection Avoid contact with eyes. The use of eye protection is recommended.

Skin and body protection The use of eye protection, gloves and long sleeve clothing is recommended.

Respiratory protection Provide workers with NIOSH approved respirators in accordance with requirements of 29 CFR 1910. 134 for level of exposure incurred.

General Hygiene Considerations Wash hands thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Solid

Appearance	Granular	**Odor**	Odorless
Color	Brownish	**Odor threshold**	No information available

Property	**Values**	**Remarks • Method**
pH	10-11	
Melting point/freezing point	>2100 °C >3800 °F	
Boiling point / boiling range	No information available	
Flash point	No information available	
Evaporation rate	Not Applicable	
Flammability (solid, gas)	No information available	
Flammability Limit in Air		
Upper flammability limit:	No information available	
Lower flammability limit:	No information available	
Vapor pressure	No information available	
Vapor density	No information available	
Specific Gravity	3.56	
Water solubility	Slight <1%	
Solubility in other solvents	No information available	
Partition coefficient	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Explosive properties	No information available	
Oxidizing properties	No information available	

Other Information

Softening point	No information available
Molecular weight	No information available
VOC Content (%)	No information available
Density	No information available
Bulk density	70-90 lb/ft3

10. STABILITY AND REACTIVITY

Reactivity
No data available

Chemical stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Hazardous polymerization Hazardous polymerization does not occur.

Conditions to avoid
Extremes of temperature and direct sunlight.

Incompatible materials
Interhalogens, bromine pentafluoride, chlorine trifluoride. Contact with aluminum metal may release hydrogen gas. Incandescent reaction wtih phosphorus pentachloride. Water will react with magnesium oxide to form magnesium hydroxide and release heat and steam.

Hazardous Decomposition Products
Heat and steam.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information Magnesium Oxide # 1309-48-4

Inhalation Inhalation of fume (not MgO dust particulate) produced upon decomposition of magnesium compounds can produce a febrile reaction and leukocytosis in humans.

Eye contact No data available.

Skin Contact No data available.

Ingestion No data available.

Information on toxicological effects

Symptoms No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization No information available.
Germ cell mutagenicity No information available.
Carcinogenicity No information available.
Reproductive toxicity No information available.
STOT - single exposure No information available.
STOT - repeated exposure No information available.
Aspiration hazard No information available.

Numerical measures of toxicity - Product Information

Unknown Acute Toxicity 100% of the mixture consists of ingredient(s) of unknown toxicity

12. ECOLOGICAL INFORMATION

Ecotoxicity

No data available on any adverse effects of this material on the environment

100% of the mixture consists of components(s) of unknown hazards to the aquatic environment

Persistence and degradability
No information available.

Bioaccumulation
No information available.

Other adverse effects No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes This produce does not exhibit any characteristics of a hazardous waste. The product is suitable for landfill disposal once the free water component is evaporated or absorbed by a suitable absorbent (earth). Follow all applicable federal, state and local regulations for safe disposal.

Contaminated packaging Do not reuse container.

14. TRANSPORT INFORMATION

DOT Not regulated Not regulated by DOT as a hazardous material. No hazard class, label or placard required, no UN or NA number assigned.

15. REGULATORY INFORMATION

International Inventories

TSCA Complies

Chemical Name	TSCA	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Magnesium Oxide	X	X	X	X	X	X	X	X

X - Listed

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313
This product does not contain any substances reportable under Sections 302, 304 or 313. Sections 311 and 312 do apply. (Routine Reporting and Chemical Inventories)

SARA 311/312 Hazard Categories

Acute health hazard	No
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

California Proposition 65
This product does not contain chemicals known to the State of California to cause cancer, birthdefects or other reproductive toxins.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania

Magnesium Oxide 1309-48-4	X	X	X

U.S. EPA Label Information

EPA Pesticide Registration Number Not Applicable

16. OTHER INFORMATION

NFPA	**Health hazards** 1	**Flammability** 0	**Instability** 0	**Physical and Chemical Properties** -
HMIS	**Health hazards** 0	**Flammability** 0	**Physical hazards** 0	**Personal protection** X

Issue Date 02-Dec-2014
Revision Date 20-April-2017
Revision Note
No information available

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

Conforms to HazCom 2012/United States

SAFETY DATA SHEET

131 Neutra™ Fuel Stabilizer

Section 1. Identification

GHS product identifier : 131 Neutra™ Fuel Stabilizer

Other means of identification : Not available.

Product type : Liquid.

Identified uses

Fuel additive for gasoline, diesel and biodiesel fuels.

Supplier's details :
Schaeffer Mfg. Company
102 Barton Street
Saint Louis, Missouri 63104
Tel: 314-865-4100
Fax: 314-865-4107
Toll Free: 1-800-325-9962
E-Mail: safety@schaefferoil.com
Web: http://www.schaefferoil.com

Emergency telephone number (with hours of operation) : +1 314 865-4105 (24-hour response number)

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture :
FLAMMABLE LIQUIDS - Category 3
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements :
Flammable liquid and vapor.
Causes serious eye irritation.
Causes skin irritation.

Precautionary statements

General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention : Wear protective gloves. Wear eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Wash hands thoroughly after handling.

Section 2. Hazards identification

Response : IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	%	CAS number
Butan-1-ol	10 - 30	71-36-3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Continue to rinse for at least 20 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes skin irritation.

Ingestion : Irritating to mouth, throat and stomach.

Section 4. First aid measures

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No known significant effects or critical hazards.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet or water-based fire extinguishers.

Specific hazards arising from the chemical : Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Section 6. Accidental release measures

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Butan-1-ol	**ACGIH TLV (United States, 6/2013).** TWA: 20 ppm 8 hours. **NIOSH REL (United States, 4/2013). Absorbed through skin.** CEIL: 150 mg/m³ CEIL: 50 ppm **OSHA PEL (United States, 2/2013).** TWA: 300 mg/m³ 8 hours. TWA: 100 ppm 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or supplied air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Clear.

Odor : Amine-like.

Odor threshold : Not available.

pH : 9.5 to 10.7

Melting point/ Dropping Point : Not available.

Boiling point : 64.44 to 92.22°C (148 to 198°F)

Flash point : Closed cup: 38°C (100.4°F) [Pensky-Martens.]

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : 0.2 kPa (1.5 mm Hg) [room temperature]

Vapor density : >1 [Air = 1]

Relative density : 0.896

Solubility : Insoluble in the following materials: cold water and hot water.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials and reducing materials.
Slightly reactive or incompatible with the following materials: organic materials, acids and alkalis.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Butan-1-ol	LC50 Inhalation Vapor LD50 Dermal LD50 Oral	Rat Rabbit Rat	24000 mg/m³ 3400 mg/kg 790 mg/kg	4 hours - -

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Butan-1-ol	Eyes - Severe irritant Skin - Moderate irritant Eyes - Severe irritant	Rabbit Rabbit Rabbit	- - -	0.005 mL 24 hours 20 mg 24 hours 2 mg	- - -

Sensitization

There is no data available.

Carcinogenicity

There is no data available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Butan-1-ol	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects

Specific target organ toxicity (repeated exposure)

There is no data available.

Aspiration hazard

There is no data available.

Information on the likely routes of exposure : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes skin irritation.

Ingestion : Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No known significant effects or critical hazards.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No known significant effects or critical hazards.

Section 11. Toxicological information

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Long term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Potential chronic health effects

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Oral Dermal	7232.4 mg/kg 31127 mg/kg

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Butan-1-ol	Acute EC50 1983000 to 2072000 µg/l Fresh water Acute LC50 1910000 µg/l Fresh water	Daphnia - Daphnia magna Fish - Pimephales promelas - Juvenile (Fledgling, Hatchling, Weanling)	48 hours 96 hours

Persistence and degradability

There is no data available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Butan-1-ol	1	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
Butan-1-ol	71-36-3	Listed	U031

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	UN1993	FLAMMABLE LIQUIDS, N. O.S. (Contains Butan-1-ol) RQ (Butan-1-ol)	3	III		This product may be re-classified as "Combustible Liquid," unless transported by vessel or aircraft. Non-bulk packages (less than or equal to 119 gal) of combustible liquids are not regulated as hazardous materials in package sizes less than the product reportable quantity. **Reportable quantity** At all time please check for possible RQ (Reportable Quantities)
IMDG Class	UN1993	FLAMMABLE LIQUIDS, N. O.S. (Contains Butan-1-ol)	3	III		-
IATA-DGR Class	UN1993	FLAMMABLE LIQUIDS, N. O.S. (Contains Butan-1-ol)	3	III		-

PG* : Packing group

AERG : 128

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) PAIR**: Naphthalene

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempted.

Clean Water Act (CWA) 307: Phenol; Naphthalene; Ethylbenzene

Clean Water Act (CWA) 311: P-cresol; M-cresol; Xylenol; O-cresol; Phenol; Naphthalene; Xylene; Ethylbenzene

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ (lbs)	SARA 302 TPQ (gallons)	SARA 304 RQ (lbs)	SARA 304 RQ (gallons)
O-cresol	0.1 - 1	Yes.	1000 / 10000	-	100	-
Phenol	0 - 0.1	Yes.	500 / 10000	-	1000	-

SARA 304 RQ : 96153.8 lbs / 43653.8 kg [12870.7 gal / 48720.8 L]

SARA 311/312

Classification : Fire hazard
Immediate (acute) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Butan-1-ol	10 - 30	Yes.	No.	No.	Yes.	No.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	Butan-1-ol	71-36-3	10 - 30
Supplier notification	Butan-1-ol	71-36-3	10 - 30

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : The following components are listed: Butan-1-ol

New York : The following components are listed: Butan-1-ol

Section 15. Regulatory information

New Jersey : The following components are listed: Distillates (petroleum), hydrotreated heavy naphthenic; Butan-1-ol

Pennsylvania : The following components are listed: Butan-1-ol

California Prop. 65

WARNING: This product contains less than 0.1% of a chemical known to the State of California to cause cancer.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Ethylbenzene	Yes.	No.	41 µg/day (ingestion) 54 µg/day (inhalation)	No.
Naphthalene	Yes.	No.	Yes.	No.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health : 2 * **Flammability :** 2 **Physical hazards :** 0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Health : 2 **Flammability :** 2 **Instability :** 0

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US Tariff Heading Number : 3811.90.0000

Schedule B Code : 3811.90.0000

History

Date of issue mm/dd/yyyy : 05/15/2014

Version : 1

Revised Section(s) : Not applicable.

Prepared by : KMK Regulatory Services Inc.

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SAFETY DATA SHEET

SDS ID NO.: 0298MAR019
Revision Date: 05/22/2015

1. IDENTIFICATION

Product Name: Marathon Petroleum Premium AW II Hydraulic Oil

Synonym: Premium AW II ISO 32 Hydraulic Oil; Premium AW II ISO 46 Hydraulic Oil; Premium AW II ISO 68 Hydraulic Oil; Premium AW II ISO 100 Hydraulic Oil; ISO 32 Premium AW II Hydraulic Oil; ISO 46 Premium AW II Hydraulic Oil; ISO 68 Premium AW II Hydraulic Oil; ISO 100 Premium AW II Hydraulic Oil

Chemical Family: Hydrocarbon Mixture

Recommended Use: Hydraulic Fluid.
Use Restrictions: All others.

Supplier Name and Address:

MARATHON PETROLEUM COMPANY LP
539 South Main Street
Findlay, OH 45840

SDS information: 1-419-421-3070

Emergency Telephone: 1-877-627-5463

2. HAZARD IDENTIFICATION

Classification

OSHA Regulatory Status
This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute aquatic toxicity	Category 3
Chronic aquatic toxicity	Category 3

Hazards Not Otherwise Classified (HNOC)
Not applicable

Label elements

EMERGENCY OVERVIEW

Harmful to aquatic life with long lasting effects

Appearance Clear Liquid **Physical State** Liquid **Odor** Petroleum

Precautionary Statements - Prevention
Avoid release to the environment

Precautionary Statements - Response
Not applicable

Precautionary Statements - Storage
Not applicable

Precautionary Statements - Disposal
Dispose of contents/container at an approved waste disposal plant

Additional Information
Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Lube oil is a complex mixture of highly refined lubricating base stocks and additives.

Composition Information:

Name	CAS Number	Weight %
Solvent Refined, Hydrotreated Heavy Paraffinic Distillate	64742-54-7	98-99
2,6-di-tert-butylphenol	128-39-2	0.1-1

4. FIRST AID MEASURES

First Aid Measures

General advice In case of accident or if you feel unwell, seek medical advice immediately (show directions for use or safety data sheet if possible).

Inhalation: Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear, give oxygen and continue to monitor. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). If symptoms occur get medical attention.

Skin Contact: Wash skin with plenty of soap and water. If irritation or other symptoms occur get medical attention. Wash contaminated clothing and clean shoes before reuse. Any injection injury from high pressure equipment should be evaluated immediately by a physician as potentially serious (See NOTES TO PHYSICIAN).

Eye Contact: Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Gently remove contacts while flushing. Get medical attention if irritation persists.

Ingestion: Rinse mouth out with water. If spontaneous vomiting occurs, keep head below hips, or if patient is lying down, turn body and head to side to prevent aspiration and monitor for breathing difficulty. Never give anything by mouth to an unconscious person. Keep affected person warm and at rest. If symptoms develop, seek medical attention.

Most important signs and symptoms, both short-term and delayed with overexposure

Adverse Effects: Preexisting skin conditions and/or respiratory disorders may be aggravated by exposure to this product.

Indication of any immediate medical attention and special treatment needed

NOTES TO PHYSICIAN: SKIN: Leaks or accidents involving high-pressure equipment may inject a stream of material through the skin and initially produce an injury that may not appear serious. Only a small puncture wound may appear on the skin surface but, without proper treatment and depending on the nature, original pressure, volume, and location of the injected material, can compromise blood supply to an affected body part. Prompt surgical debridement of the wound may be necessary to prevent irreversible loss of function and/or the affected body part. High pressure injection injuries may be SERIOUS SURGICAL EMERGENCIES.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
For small fires, Class B fire extinguishing media such as CO2, dry chemical, foam (AFFF/ATC) or water spray can be used. For large fires, water spray, fog or foam (AFFF/ATC) can be used. Firefighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

Unsuitable extinguishing media
Do not use a solid water stream as it may scatter and spread fire.

Specific hazards arising from the chemical
The product is not combustible per the OSHA Hazard Communication Standard, but will ignite and burn at temperatures exceeding the flash point.

Hazardous combustion products
Smoke, carbon monoxide, and other products of incomplete combustion.

Explosion data
Sensitivity to Mechanical Impact No.
Sensitivity to Static Discharge No.

Special protective equipment and precautions for firefighters
Avoid using straight water streams. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible. Avoid excessive water spray application. Use water spray to cool exposed surfaces from as far a distance as possible. Keep run-off water out of sewers and water sources.

NFPA:	Health 1	Flammability 1	Instability 0	Special Hazards -

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Keep public away. Isolate and evacuate area. Shut off source if safe to do so.

Protective Equipment: Use personal protection measures as recommended in Section 8.

Emergency Procedures: Advise authorities and National Response Center (800-424-8802) if the product has entered a water course or sewer. Notify local health and pollution control agencies, if appropriate.

Environmental precautions: Avoid release to the environment. Avoid subsoil penetration.

Methods and materials for containment: Prevent further leakage or spillage if safe to do so.

Methods and materials for cleaning up: Use suitable absorbent materials such as vermiculite, sand, or clay to clean up residual liquids. Recover and return free product to proper containers.

7. HANDLING AND STORAGE

Safe Handling Precautions: Avoid contact with skin, eyes and clothing. Do not swallow. Avoid breathing vapors or mists. Use good personal hygiene practices. Wash thoroughly after handling. Use personal protection measures as recommended in Section 8. Do not cut, drill, grind or weld on empty containers since explosive residues may remain. Refer to applicable EPA, OSHA, NFPA and consistent state and local requirements.

High-pressure injection of any material through the skin is a serious medical emergency even though the small entrance wound at the injection site may not initially appear serious. These injection injuries can occur from high-pressure equipment such as paint spray or grease or guns, fuel injectors, or pinhole leaks in hoses or hydraulic lines and should all be considered serious. High pressure injection injuries may be SERIOUS SURGICAL EMERGENCIES (See First Aid Section 4).

Storage Conditions: Store in properly closed containers that are appropriately labeled and in a cool, well-ventilated area. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Store away from incompatible materials.

Incompatible materials Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	ACGIH TLV	OSHA PELS:	OSHA - Vacated PELs	NIOSH IDLH
Solvent Refined, Hydrotreated Heavy Paraffinic Distillate 64742-54-7	Mineral oil, highly/severely refined, inhalable fraction 5 mg/m³ TWA	-	-	-
2,6-di-tert-butylphenol 128-39-2	-	-	-	-

Notes: The manufacturer has voluntarily elected to provide exposure limits contained in OSHA's 1989 air contaminants standard in its SDSs, even though certain of those exposure limits were vacated in 1992.

Engineering measures: Local or general exhaust required when using at elevated temperatures that generate vapors or mists.

Personal protective equipment

Eye protection: Use goggles or face-shield if the potential for splashing exists.

Skin and body protection: Wear neoprene, nitrile or PVA gloves to prevent skin contact. Glove suitability is based on workplace conditions and usage. Contact the glove manufacturer for specific advice on glove selection and breakthrough times. Wear appropriate protective clothing.

Respiratory protection: Use an approved organic vapor chemical cartridge or supplied air respirators when material produces vapors that exceed permissible exposure limits or excessive vapors are generated. Observe respirator assigned protection factors (APFs) criteria cited in federal OSHA 29 CFR 1910.134. Self-contained breathing apparatus should be used for fire fighting.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid
Appearance	Clear Liquid
Color	Clear
Odor	Petroleum
Odor Threshold	No available data.

Property	Values (Method)
Melting Point / Freezing Point	No available data.
Initial Boiling Point / Boiling Range	No available data.
Flash Point	> 220 °C / > 428 °F (Cleveland Open-Cup)
Evaporation Rate	No available data.
Flammability (solid, gas)	Not applicable.
Flammability Limit in Air (%)	
Upper Flammability Limit:	No available data.
Lower Flammability Limit:	No available data.
Vapor Pressure	No available data.
Vapor Density	No available data.
Specific Gravity / Relative Density	0.86-0.88
Water Solubility	No available data.
Solubility in other solvents	No available data.
Partition Coefficient	No available data.
Decomposition temperature:	No available data.
pH:	No available data.
Autoignition Temperature	No available data.
Kinematic Viscosity	≥ 28.8 mm2/s @ 40°C / 104°F (ASTM D445)
Dynamic Viscosity	No available data.
Explosive Properties	No available data.
Softening Point	No available data.
VOC Content (%)	0.12-37.7 (w/w)
Density	No available data.
Bulk Density	Not applicable.

10. STABILITY AND REACTIVITY

Reactivity The product is non-reactive under normal conditions.

Chemical stability Stable under recommended storage conditions.

Possibility of hazardous reactions None under normal processing.

Hazardous polymerization Will not occur.

Conditions to avoid Sources of heat or ignition.

Incompatible materials Strong oxidizing agents.

Hazardous decomposition products None known under normal conditions of use.

11. TOXICOLOGICAL INFORMATION

Potential short-term adverse effects from overexposures

Inhalation Overheating may produce vapors which may cause respiratory irritation, dizziness and nausea.

Eye contact Exposure to vapor or contact with liquid may cause mild eye irritation.

Skin contact Prolonged or repeated exposure may cause dermatitis, folliculitis or oil acne.

Ingestion May cause irritation of the mouth, throat and gastrointestinal tract.

Acute Toxicological data

Name	Oral LD50	Dermal LD50	Inhalation LC50

Solvent Refined, Hydrotreated Heavy Paraffinic Distillate 64742-54-7	> 5000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 5.5 mg/l (Rat) 4 h
2,6-di-tert-butylphenol 128-39-2	> 5000 mg/kg (Rat)	> 10 g/kg (Rabbit)	-

Delayed and immediate effects as well as chronic effects from short and long-term exposure

This product is considered to have a low order of acute and chronic oral and dermal toxicity.

Adverse effects related to the physical, chemical and toxicological characteristics

Signs & Symptoms Repeated or prolonged skin contact may cause drying, reddening, itching and cracking.

Sensitization Not expected to be a skin or respiratory sensitizer.

Mutagenic effects None known.

Carcinogenicity Cancer designations are listed in the table below.

Name	ACGIH (Class)	IARC (Class)	NTP	OSHA
Solvent Refined, Hydrotreated Heavy Paraffinic Distillate 64742-54-7	Mineral oil, poorly/mildly refined Suspected Human Carcinogen (A2) Mineral oil, highly/severely refined, inhalable fraction Not Classifiable (A4)	Mineral oil, untreated or mildly treated Carcinogenic to humans (1) Mineral oil, highly refined Not Classifiable (3)	Mineral oil, poorly/mildly refined Known to be human carcinogen	Not Listed
2,6-di-tert-butylphenol 128-39-2	Not Listed	Not Listed	Not Listed	Not Listed

Reproductive toxicity None known.

Specific Target Organ Toxicity (STOT) - single exposure Not classified.

Specific Target Organ Toxicity (STOT) - repeated exposure Not classified.

Aspiration hazard Not classified.

12. ECOLOGICAL INFORMATION

Ecotoxicity Harmful to aquatic life with long lasting effects.

Name	Algae/aquatic plants	Fish	Toxicity to Microorganisms	Crustacea
Solvent Refined, Hydrotreated Heavy Paraffinic Distillate 64742-54-7	-	96-hr LC50 = 5000 mg/L Rainbow trout	-	48-hr EC50 = 1000 mg/L Daphnia magna
2,6-di-tert-butylphenol 128-39-2	-	-	-	48-hr EC50 = 0.45 mg/l Daphnia magna

Persistence and degradability No information available.

Bioaccummulation Contains component(s) with the potential to bioaccumulate.

Mobility in soil No information available.

Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Description of Waste Residues
No information available.

Safe Handling of Wastes
Handle in accordance with applicable local, state, and federal regulations. Use personal protection measures as required.

Disposal of Wastes / Methods of Disposal
The user is responsible for determining if any discarded material is a hazardous waste (40 CFR 262.11). Dispose of in accordance with federal, state and local regulations.

Methods of Contaminated Packaging Disposal
Empty containers should be completely drained and then discarded or recycled, if possible. Do not cut, drill, grind or weld on empty containers since explosive residues may be present. Dispose of in accordance with federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT (49 CFR 172.101):

UN Proper shipping name:	Not Regulated
UN/Identification No:	Not applicable
Transport Hazard Class(es):	Not applicable
Packing group:	Not applicable

TDG (Canada):

UN Proper shipping name:	Not Regulated
UN/Identification No:	Not applicable
Transport Hazard Class(es):	Not applicable
Packing group:	Not applicable

15. REGULATORY INFORMATION

US Federal Regulatory Information:

US TSCA Chemical Inventory Section 8(b): This product and/or its components are listed on the TSCA Chemical Inventory.

EPA Superfund Amendment & Reauthorization Act (SARA):

SARA Section 302: This product may contain component(s) that have been listed on EPA's Extremely Hazardous Substance (EHS) List:

Name	CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs
Solvent Refined, Hydrotreated Heavy Paraffinic Distillate	NA
2,6-di-tert-butylphenol	NA

SARA Section 304: This product may contain component(s) identified either as an EHS or a CERCLA Hazardous substance which in case of a spill or release may be subject to SARA reporting requirements:

Name	CERCLA/SARA - Hazardous Substances and their Reportable Quantities
Solvent Refined, Hydrotreated Heavy Paraffinic Distillate	NA
2,6-di-tert-butylphenol	NA

SARA: The following EPA hazard categories apply to this product:

None

SARA Section 313: This product may contain component(s), which if in exceedance of the de minimus threshold, may be subject to the reporting requirements of SARA Title III Section 313 Toxic Release Reporting (Form R).

Name	CERCLA/SARA 313 Emission reporting:
Solvent Refined, Hydrotreated Heavy Paraffinic Distillate	None
2,6-di-tert-butylphenol	None

State and Community Right-To-Know Regulations:
The following component(s) of this material are identified on the regulatory lists below:

Solvent Refined, Hydrotreated Heavy Paraffinic Distillate

Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Not Listed.
New Jersey Right-To-Know:	Not Listed.
Pennsylvania Right-To-Know:	Not Listed.
Massachusetts Right-To Know:	Not Listed.
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Not Listed.
Michigan Critical Materials Register List:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed.
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Not Listed.
New Jersey - Special Hazardous Substances:	Carcinogen
New Jersey - Environmental Hazardous Substances List:	Not Listed.
Illinois - Toxic Air Contaminants	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed.

2,6-di-tert-butylphenol

Louisiana Right-To-Know:	Not Listed.
California Proposition 65:	Not Listed.
New Jersey Right-To-Know:	Not Listed.
Pennsylvania Right-To-Know:	Not Listed.
Massachusetts Right-To Know:	Not Listed.
Florida Substance List:	Not Listed.
Rhode Island Right-To-Know:	Not Listed.
Michigan Critical Materials Register List:	Not Listed.
Massachusetts Extraordinarily Hazardous Substances:	Not Listed.
California - Regulated Carcinogens:	Not Listed.
Pennsylvania RTK - Special Hazardous Substances:	Not Listed.
New Jersey - Special Hazardous Substances:	Not Listed.
New Jersey - Environmental Hazardous Substances List:	Not Listed.
Illinois - Toxic Air Contaminants	Not Listed.
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed.

Canada DSL/NDSL Inventory: This product and/or its components are listed either on the Domestic Substances List (DSL) or are exempt.

Canadian Regulatory Information: "This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the (M)SDS contains all the information required by the Controlled Products Regulations."

Name	Canada - WHMIS: Classifications of Substances:	Canada - WHMIS: Ingredient Disclosure:
2,6-di-tert-butylphenol	D2B	1%

NOTE: Uncontrolled product according to WHMIS classification criteria.

16. OTHER INFORMATION

Prepared By Toxicology and Product Safety
Revision Date: 05/22/2015

Revision Note:

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is intended as guidance for safe handling, use, processing, storage, transportation, accidental release, clean-up and disposal and is not considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Safety Data Sheet

Material Name: Hess 10W30 Motor Oil

SDS No. 8957
US GHS

Synonyms: Valvoline Product Code 52670413

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

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

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

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Skin Corrosion/Irritation – Category 2
Specific Target Organ Toxicity – Category 3 (narcosis)
Carcinogenicity - Category 1B

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

WARNING

Hazard Statements

Causes skin irritation.
May cause cancer.
May cause drowsiness or dizziness.

Precautionary Statements

Prevention

Wash hands and forearms thoroughly after handling.
Wear protective gloves/protective clothing/eye protection.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid breathing fume/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.

Response

If on skin: Wash with plenty of soap and water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.
If exposed or concerned: Get medical advice/attention.
If inhaled: Remove person to fresh air and keep in a position comfortable for breathing. Call poison center or doctor if you feel unwell.

Storage

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

Disposal

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

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

CAS #	Component	Percent
64742-65-0	Petroleum distillates, solvent dewaxed heavy paraffinic	83-93

Petroleum-based lubricating oil with detergent/dispersant engine oil package with zinc compounds.

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

First Aid: Eyes

If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is visual difficulty, seek medical attention.

First Aid: Skin

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

First Aid: Ingestion

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

First Aid: Inhalation

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

First Aid: Notes to Physician

Acute aspiration of large amounts of oil-laden material may produce a serious aspiration hazard. Patients who aspirate these oils should be followed for the development of long-term sequelae. Repeated aspiration of mineral oil can produce chronic inflammation of the lungs (i.e. lipoid pneumonia) that may progress to pulmonary fibrosis. Symptoms are often subtle and radiological changes appear worse than clinical abnormalities. Occasionally, persistent cough, irritation of the upper respiratory tract, shortness of breath with exertion, fever, and bloody sputum occur. Inhalation exposure to oil mists below current workplace exposure limits is unlikely to cause pulmonary abnormalities. Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin.

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

General Fire Hazards

See Section 9 for Flammability Properties.
Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively. No special fire hazards are known to be associated with this product. Dense smoke may be generated while burning.

Hazardous Combustion Products

May form: carbon dioxide and carbon monoxide, oxides of sulfur, nitrogen and phosphorous, various hydrocarbons.

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or gaseous extinguishing agent.

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

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

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

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

Recovery and Neutralization

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

Materials and Methods for Clean-Up

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

SMALL SPILL: Absorb liquid on vermiculite, floor absorbent or other absorbent material. Persons not wearing proper personal protective equipment should be excluded from area of spill.

LARGE SPILL: Prevent run-off to sewers, streams, or other bodies of water. If run-off occurs, notify authorities as required, that a spill has occurred. Persons not wearing proper personal protective equipment should be excluded from area of spill until clean-up has been completed.

Emergency Measures

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

Personal Precautions and Protective Equipment

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

Environmental Precautions

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

Prevention of Secondary Hazards

None

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

Handling Procedures

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

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

Storage Procedures

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

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

Incompatibilities

Avoid contact with: acids, halogens, strong oxidizing agents.

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

Component Exposure Limits

ACGIH, OSHA, and NIOSH have not developed exposure limits for any of this product's components.

Engineering Measures

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

Personal Protective Equipment: Respiratory

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

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

Personal Protective Equipment: Hands

Not normally required. However, wear resistant gloves such as nitrile rubber to prevent irritation which may result from prolonged or repeated skin contact with product.

Personal Protective Equipment: Eyes

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

Personal Protective Equipment: Skin and Body

To prevent repeated or prolonged skin contact, wear impervious clothing and boots. Wear normal work clothing covering arms and legs.

Hygiene Measures

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

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

Appearance:	Dry, clear and bright	**Odor:**	None
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	ND	**Vapor Density:**	ND
Boiling Point:	>425 °F (218.3°C) @ 760.00 mmHg	**Melting Point:**	ND
Solubility (H2O):	Negligible	**Specific Gravity:**	0.881 @ 60°F (16°C)
Evaporation Rate:	Slower than ethyl ether	**VOC:**	ND
Viscosity:	<= 3300.0 cps @ -20°C; 10.0 - 11.0 cst @ 100°C	**Octanol/H2O Coeff.:**	ND
Flash Point:	430 °F (221.1 °C)	**Flash Point Method:**	COC
Upper Flammability Limit (UFL):	ND	**Lower Flammability Limit (LFL):**	ND
Burning Rate:	ND	**Auto Ignition:**	ND

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

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

None

Incompatible Products

Avoid contact with: acids, halogens, strong oxidizing agents.

Hazardous Decomposition Products

May form: aldehydes, carbon dioxide and carbon monoxide, hydrogen sulfide, oxides of sulfur, nitrogen and phosphorus, toxic fumes, various hydrocarbons.

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if large amounts are swallowed.

B: Component Analysis - LD50/LC50

Petroleum distillates, solvent dewaxed heavy paraffinic (64742-65-0)

Inhalation LC50 Rat >4.7 mg/L 4 h; Oral LD50 Rat >5000 mg/kg; Dermal LD50 Rabbit >5000 mg/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

May cause mild skin irritation. Prolonged or repeated contact may dry the skin. Symptoms include redness, burning, drying and cracking of the skin, and skin burns. Additional symptoms of skin contact include: acne. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

May cause mild eye irritation. Symptoms include stinging, tearing, and redness.

Potential Health Effects: Ingestion

Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Potential Health Effects: Inhalation

It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits.

Respiratory Organs Sensitization/Skin Sensitization

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

Generative Cell Mutagenicity

This product is not reported to have any mutagenic effects.

Carcinogenicity

A: General Product Information

May cause cancer.

Used motor oil has been shown to cause skin cancer in laboratory animal continually exposed by repeated applications.

B: Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Reproductive Toxicity

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

Specified Target Organ General Toxicity: Single Exposure

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

Specified Target Organ General Toxicity: Repeated Exposure

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

Aspiration Respiratory Organs Hazard

Acute aspiration of large amounts of oil-laden material may produce a serious aspiration hazard.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

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

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Petroleum distillates, solvent dewaxed heavy paraffinic (64742-65-0)

Test & Species	Conditions
96 Hr LC50 Oncorhynchus mykiss	>5000 mg/L
48 Hr EC50 Daphnia magna	>1000 mg/L

Persistence/Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

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

Disposal of Contaminated Containers or Packaging

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

* * * Section 14 - Transportation Information * * *

DOT Information

Shipping Name: Not Regulated

* * * Section 15 - Regulatory Information * * *

Regulatory Information

Component Analysis

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

SARA Section 311/312 – Hazard Classes

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

SARA SECTION 313 - SUPPLIER NOTIFICATION

ZINC C1-C14 ALKYLDITHIOPHOSPHATE (CAS No. 68649-42-3)

State Regulations

Component Analysis - State

None of this product's components are listed on the state lists from CA, MA, MN, NJ, PA, or RI.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Additional Regulatory Information

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Petroleum distillates, solvent dewaxed heavy paraffinic	64742-65-0	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	1
Fire	1
Reactivity	0

HMIS® Hazard Rating

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

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

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

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

End of Sheet

OFF!® DEEP WOODS® INSECT REPELLENT VIII (DRY)

Version *2*.0 Print Date 09/08/2016

Revision Date 07/12/2016 SDS Number 350000015104

1. PRODUCT AND COMPANY IDENTIFICATION

Product information

Product name : **OFF!® DEEP WOODS® INSECT REPELLENT VIII (DRY)**

Recommended use : Insect Repellent

Manufacturer, importer, supplier : S.C. Johnson & Son, Inc.
1525 Howe Street
Racine WI 53403-2236

Telephone : +18005585252

Emergency telephone number : 24 Hour Medical Emergency Phone: (866)231-5406
24 Hour International Emergency Phone: (703)527-3887
24 Hour Transport Emergency Phone: (800)424-9300

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

Globally Harmonized System (GHS) Classification

Hazard classification	Hazard category	Hazards identification
Aerosol	Category 1	Extremely flammable aerosol.
Eye irritation	Category 2A	Causes serious eye irritation.
Gases under pressure	Liquefied gas	Contains gas under pressure; may explode if heated.

Labelling

Hazard symbols
Flame
Gas cylinder
Exclamation mark

Signal word
Danger

Hazard statements
Extremely flammable aerosol.
Contains gas under pressure; may explode if heated.
Causes serious eye irritation.

Precautionary statements
If medical advice is needed, have product container or label at hand.
Keep out of reach of children.
Read label before use.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/ attention.
Protect from sunlight. Do not expose to temperatures exceeding 50 °C/ 122 °F.
Protect from sunlight. Store in a well-ventilated place.
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Do not spray on an open flame or other ignition source.
Do not pierce or burn, even after use.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Wash hands thoroughly after handling.
Other hazards : None identified

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No.	Weight percent
N,N-Diethyl-m-toluamide	134-62-3	10.00 - 30.00
Ethyl alcohol	64-17-5	10.00 - 30.00
Butane	106-97-8	10.00 - 30.00
Corn starch	9005-25-8	10.00 - 30.00
Propane	74-98-6	5.00 - 10.00
Isobutane	75-28-5	5.00 - 10.00
Isopropyl Myristate	110-27-0	1.00 - 5.00
Magnesium carbonate	546-93-0	1.00 - 5.00

The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade secret.

For additional information on product ingredients, see www.whatsinsidescjohnson.com.

4. FIRST AID MEASURES

Eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/ attention.

Skin contact	:	If you suspect a reaction to this product, discontinue use and remove contaminated clothing.
Inhalation	:	No special requirements.
Ingestion	:	No special requirements

5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Specific hazards during firefighting	:	Aerosol Product - Containers may rocket or explode in heat of fire. Do not allow run-off from fire fighting to enter drains or water courses.
Further information	:	Fight fire from maximum distance or protected area. Cool and use caution when approaching or handling fire-exposed containers. Wear full protective clothing and positive pressure self-contained breathing apparatus. In case of fire and/or explosion do not breathe fumes.
NFPA Classification	:	NFPA Level 2 Aerosol

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	:	Remove all sources of ignition. Wear personal protective equipment. Wash thoroughly after handling.
Environmental precautions	:	Do not flush into surface water or sanitary sewer system. Use appropriate containment to avoid environmental contamination. Outside of normal use, avoid release to the environment.
Methods and materials for containment and cleaning up	:	If damage occurs to aerosol can: Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).

Use only non-sparking equipment.
Dike large spills.
Clean residue from spill site.

7. HANDLING AND STORAGE

Handling

Precautions for safe handling : Avoid contact with eyes and lips.
For personal protection see section 8.
Use only as directed.
KEEP OUT OF REACH OF CHILDREN AND PETS.
Pressurized container.
Do not pierce or burn, even after use.
Wash thoroughly after handling.

Advice on protection against fire and explosion : Keep away from sources of ignition - No smoking.
Do not spray on an open flame or other ignition source.

Storage

Requirements for storage areas and containers : Protect from sunlight. Do not expose to temperatures exceeding 50 °C/ 122 °F.
Keep away from food, drink and animal feedingstuffs.
Keep in a dry, cool and well-ventilated place.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Components	CAS-No.	mg/m3	ppm	Non-standard units	Basis
Ethyl alcohol	64-17-5	1,900 mg/m3	1,000 ppm	-	OSHA TWA
Ethyl alcohol	64-17-5	-	1,000 ppm	-	ACGIH STEL
Butane	106-97-8	-	1,000 ppm	-	ACGIH STEL
Corn starch	9005-25-8	5 mg/m3	-	-	OSHA TWA
Corn starch	9005-25-8	15 mg/m3	-	-	OSHA TWA
Corn starch	9005-25-8	10 mg/m3	-	-	ACGIH TWA
Propane	74-98-6	1,800 mg/m3	1,000 ppm	-	OSHA TWA
Propane	74-98-6	-	-	-	ACGIH TWA
Isobutane	75-28-5	-	1,000 ppm	-	ACGIH STEL
Magnesium carbonate	546-93-0	15 mg/m3	-	-	OSHA TWA
Magnesium carbonate	546-93-0	5 mg/m3	-	-	OSHA TWA

Personal protective equipment

Respiratory protection : Do not spray in enclosed areas.

Hand protection : No special requirements.

Eye protection : Safety glasses with side-shields

Skin and body protection	:	No special requirements.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	:	aerosol
Form	:	Compressed gas
Color	:	white
Odor	:	pleasant
Odour Threshold	:	No data available
pH	:	10.3 (as aqueous solution)
Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	No data available
Flash point	:	< -7 °C < 19.4 °F Propellant
Evaporation rate	:	No data available
Flammability (solid, gas)	:	Sustains combustion
Upper/lower flammability or explosive limits	:	No data available

Vapour pressure	:	No data available
Vapour density	:	No data available
Relative density	:	0.82 g/cm3
Solubility(ies)	:	dispersible
Partition coefficient: n-octanol/water	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	Test not applicable for this product type
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Oxidizing properties	:	No data available
Volatile Organic Compounds Total VOC (wt. %)*	:	52.6 % - additional exemptions may apply *as defined by US Federal and State Consumer Product Regulations
Other information	:	None identified :

10. STABILITY AND REACTIVITY

Possibility of hazardous	:	If accidental mixing occurs and toxic gas is formed, exit area

reactions immediately. Do not return until well ventilated.

Conditions to avoid : Heat, flames and sparks.

Incompatible materials : Strong oxidizing agents
Do not mix with bleach or any other household cleaners.
Strong bases

Hazardous decomposition products : Thermal decomposition can lead to release of irritating gases and vapours.

11. TOXICOLOGICAL INFORMATION

Emergency Overview : Danger

Acute oral toxicity :
Acute inhalation toxicity :

Acute dermal toxicity :

GHS Properties	Classification	Routes of entry
Acute toxicity	No classification proposed	-
Skin corrosion/irritation	No classification proposed	-
Eye irritation	Category 2A	-
Skin sensitisation	No classification proposed	-
Respiratory sensitisation	No classification proposed	-
Germ cell mutagenicity	No classification proposed	-
Carcinogenicity	No classification proposed	-
Reproductive toxicity	No classification proposed	-
Specific target organ	No classification proposed	-

toxicity - single exposure		
Specific target organ toxicity - repeated exposure	No classification proposed	-
Aspiration hazard	No classification proposed	-

Aggravated Medical Condition : Do not apply to cuts or irritated skin.

12. ECOLOGICAL INFORMATION

Product : The product itself has not been tested.

Toxicity
The ingredients in this formula have been reviewed and no adverse impact to the environment is expected when used according to label directions.

Toxicity to fish

Components	End point	Species	Value	Exposure time
N,N-Diethyl-m-toluamide	static test LC50	Oncorhynchus mykiss (rainbow trout)	71.25 mg/l	96 h
Ethyl alcohol	LC50	Fish	11,200 mg/l	96 h
Butane	LC50 QSAR	Fish	27.98 mg/l	96 h
Corn starch	static test LC50 Measured No information	Fish	5,000 mg/l	96 h

	available.			
Propane	LC50	Fish	27.98 mg/l	96 h
Isobutane	LC50 QSAR	Fish	27.98 mg/l	96 h
Isopropyl Myristate	LC50	Danio rerio (zebra fish)	8,400 mg/l	96 h
Magnesium carbonate	static test LC50	Pimephales promelas (fathead minnow)	2,800 mg/l	96 h

Toxicity to aquatic invertebrates

Components	**End point**	**Species**	**Value**	**Exposure time**
N,N-Diethyl-m-toluamide	LC50	Daphnia magna (Water flea)	75 mg/l	51 h
	semi-static test NOEC Measured OECD Guideline 211 (Daphnia magna Reproduction Test)	Daphnia magna	3.7 mg/l	21 d
Ethyl alcohol	static test LC50	Ceriodaphnia dubia		48 h

	NOEC	Daphnia magna	5,012 mg/l 9.6 mg/l	9 d
Butane	No data available			
Corn starch	No data available			
Propane	LC50	Daphnid	14.22 mg/l	48 h
Isobutane	LC50 QSAR	Daphnid	16.33 mg/l	48 h
Isopropyl Myristate	EC50	Daphnia magna (Water flea)	100 mg/l	48 h
Magnesium carbonate	No data available			

Toxicity to aquatic plants

Components	End point	Species	Value	Exposure time
N,N-Diethyl-m-toluamide	NOEC	Pseudokirchneriella subcapitata (green algae)	0.521 mg/l	96 h
Ethyl alcohol	Static EC50	Chlorella vulgaris (Fresh water algae)	275 mg/l	72 h

Butane	EC50 QSAR	Green algae	7.71 mg/l	96 h
Corn starch	No data available			
Propane	No data available			
Isobutane	EC50 QSAR	Green algae	8.57 mg/l	96 h
Isopropyl Myristate	EC50	Desmodesmus subspicatus	> 100 mg/l	72 h
Magnesium carbonate	static test EC50 Read-across (Analogy)	Desmodesmus subspicatus (green algae)	> 100 mg/l	72 h

Persistence and degradability

Component	Biodegradation	Exposure time	Summary
N,N-Diethyl-m-toluamide	83.8 %	28 d	Readily biodegradable
Ethyl alcohol	97 %	28 d	Readily biodegradable
Butane	100 %	385.5 h	Readily biodegradable
Corn starch	No data available		Readily biodegradable
Propane	70 %	< 10 d	Readily biodegradable
Isobutane	70 %	< 10 d	Readily biodegradable
Isopropyl Myristate	91.4 %	28 d	Readily biodegradable
Magnesium carbonate	No data available		

Bioaccumulative potential

Component	Bioconcentration	Partition Coefficient n-

	factor (BCF)	Octanol/water (log)
N,N-Diethyl-m-toluamide	21.9 estimated	2.4
Ethyl alcohol	3.2 estimated	-0.35 Measured
Butane	No data available	2.89
Corn starch	No data available	No data available
Propane	No data available	2.36
Isobutane	1.57 - 1.97	2.8
Isopropyl Myristate	1,220.1	7.71
Magnesium carbonate	0.89 QSAR	-2.12 QSAR

Mobility

Component	End point	Value
N,N-Diethyl-m-toluamide	Koc	43.3
Ethyl alcohol	No data available	
Butane	No data available	
Corn starch	No data available	
Propane	No data available	
Isobutane	No data available	
Isopropyl Myristate	log Koc	4.08
Magnesium carbonate	No data available	

PBT and vPvB assessment

Component	Results
N,N-Diethyl-m-toluamide	Not fulfilling PBT and vPvB criteria
Ethyl alcohol	Not fulfilling PBT and vPvB criteria
Butane	Not fulfilling PBT and vPvB criteria
Corn starch	Not fulfilling PBT and vPvB criteria
Propane	Not fulfilling PBT and vPvB criteria
Isobutane	Not fulfilling PBT and vPvB criteria
Isopropyl Myristate	Not fulfilling PBT and vPvB criteria

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Magnesium carbonate	Not fulfilling PBT and vPvB criteria

Other adverse effects : No data available

13. DISPOSAL CONSIDERATIONS

PESTICIDAL WASTE:
For disposal information, please read and follow Disposal instructions on the pesticide label.
Consumer may discard empty container in trash, or recycle where facilities exist.

14. TRANSPORT INFORMATION

Please refer to the Bill of Lading/receiving documents for up-to-date shipping information.

	Land transport	**Sea transport**	**Air transport**
UN number	1950	1950	1950
UN proper shipping name	AEROSOLS, Flammable	AEROSOLS, Flammable	AEROSOLS, Flammable
Transport hazard class(es)	2.1	2	2.1
Packing group	-	-	-
Environmental hazards	-	-	-
Special precautions for user	Limited quantities derogation may be applicable to this product, please check transport documents.	Limited quantities derogation may be applicable to this product, please check transport documents.	Limited quantities derogation may be applicable to this product, please check transport documents.

15. REGULATORY INFORMATION

FIFRA Labeling

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This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals.

Following is the hazard information as required on the pesticide label:

WARNING:
Causes substantial but temporary eye injury.
Harmful if swallowed.
Use of this product may cause skin reactions in rare cases.
Extremely flammable
Contents under pressure.
Exposure to temperatures above 120° F may cause bursting.

Notification status	:	All ingredients of this product are listed or are excluded from listing on the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.
Notification status	:	All ingredients of this product comply with the New Substances Notification requirements under the Canadian Environmental Protection Act (CEPA).
California Prop. 65	:	This product is not subject to the reporting requirements under California's Proposition 65.

Registration # / Agency
4822-572/US/EPA
30598/PMRA

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16. OTHER INFORMATION

HMIS Ratings

Health	2
Flammability	4
Reactivity	0

NFPA Ratings

Health	2
Fire	4
Reactivity	0
Special	-

This information is being provided in accordance with the Occupational Safety and Health Administration (OSHA) regulation (29 CFR 1910.1200). The information supplied is designed for workplaces where product use and frequency of exposure exceeds that established for the labeled consumer use.

Further information

This document has been prepared using data from sources considered to be technically reliable. It does not constitute a warranty, expressed or implied, as to the accuracy of the information contained herein. Actual conditions of use are beyond the seller's control. User is responsible to evaluate all available information when using product for any particular use and to comply with all Federal, State, Provincial and Local laws and regulations.

Prepared by	SC Johnson Global Safety Assessment & Regulatory Affairs (GSARA)

Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950
US GHS

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

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

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

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

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquid - Category 2
Skin Corrosion/Irritation - Category 2
Germ Cell Mutagenicity - Category 1B
Carcinogenicity - Category 1B
Toxic to Reproduction - Category 1A
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)
Specific Target Organ Toxicity (Repeat Exposure) - Category 1 (liver, kidneys, bladder, blood, bone marrow, nervous system)
Aspiration Hazard - Category 1
Hazardous to the Aquatic Environment – Acute Hazard - Category 3

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

DANGER

Hazard Statements

Highly flammable liquid and vapour.
Causes skin irritation.
May cause genetic defects.
May cause cancer.
May damage fertility or the unborn child.
May cause respiratory irritation.
May cause drowsiness or dizziness.
Causes damage to organs (liver, kidneys, bladder, blood, bone marrow, nervous system) through prolonged or repeated exposure.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe mist/vapours/spray.
Use only outdoors or in well-ventilated area.
Do not eat, drink or smoke when using this product.
Avoid release to the environment.

Response

In case of fire: Use water spray, fog, dry chemical fire extinguishers or hand held fire extinguisher.
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.
IF exposed or concerned: Get medical advice/attention.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.
Get medical advice/attention if you feel unwell.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting.

Storage

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

Disposal

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

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

CAS #	Component	Percent
86290-81-5	Gasoline, motor fuel	100
108-88-3	Toluene	1-25
106-97-8	Butane	<10
1330-20-7	Xylenes (o-, m-, p- isomers)	1-15
95-63-6	Benzene, 1,2,4-trimethyl-	<6
64-17-5	Ethyl alcohol	0-10
100-41-4	Ethylbenzene	<3
71-43-2	Benzene	0.1-4.9

110-54-3	Hexane	0.5-4

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

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

First Aid: Eyes

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

First Aid: Skin

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

First Aid: Ingestion

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

First Aid: Inhalation

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

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

General Fire Hazards

See Section 9 for Flammability Properties.

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

Hazardous Combustion Products

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

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or gaseous extinguishing agent.

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

Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

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

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

Recovery and Neutralization

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

Materials and Methods for Clean-Up

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

Emergency Measures

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

Personal Precautions and Protective Equipment

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

Environmental Precautions

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

Prevention of Secondary Hazards

None

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

Handling Procedures

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

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

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

Storage Procedures

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

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

Incompatibilities

Keep away from strong oxidizers.

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

Component Exposure Limits

Gasoline, motor fuel (86290-81-5)

ACGIH: 300 ppm TWA
500 ppm STEL

Toluene (108-88-3)

ACGIH: 20 ppm TWA
OSHA: 200 ppm TWA; 375 mg/m3 TWA
150 ppm STEL; 560 mg/m3 STEL
NIOSH: 100 ppm TWA; 375 mg/m3 TWA
150 ppm STEL; 560 mg/m3 STEL

Butane (106-97-8)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)
OSHA: 800 ppm TWA; 1900 mg/m3 TWA
NIOSH: 800 ppm TWA; 1900 mg/m3 TWA

Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: 100 ppm TWA
150 ppm STEL
OSHA: 100 ppm TWA; 435 mg/m3 TWA
150 ppm STEL; 655 mg/m3 STEL

Benzene, 1,2,4-trimethyl- (95-63-6)

NIOSH: 25 ppm TWA; 125 mg/m3 TWA

Ethyl alcohol (64-17-5)

ACGIH: 1000 ppm STEL
OSHA: 1000 ppm TWA; 1900 mg/m3 TWA
NIOSH: 1000 ppm TWA; 1900 mg/m3 TWA

Ethylbenzene (100-41-4)

ACGIH: 20 ppm TWA
OSHA: 100 ppm TWA; 435 mg/m3 TWA
125 ppm STEL; 545 mg/m3 STEL
NIOSH: 100 ppm TWA; 435 mg/m3 TWA
125 ppm STEL; 545 mg/m3 STEL

Benzene (71-43-2)

ACGIH: 0.5 ppm TWA
2.5 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH: 0.1 ppm TWA
1 ppm STEL

Hexane (110-54-3)

ACGIH: 50 ppm TWA
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 500 ppm TWA; 1800 mg/m3 TWA
NIOSH: 50 ppm TWA; 180 mg/m3 TWA

Engineering Measures

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

Personal Protective Equipment: Respiratory

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

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

Personal Protective Equipment: Hands

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

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes

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

Personal Protective Equipment: Skin and Body

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

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

Appearance:	Translucent, straw-colored or light yellow	**Odor:**	Strong, characteristic aromatic hydrocarbon odor. Sweet-ether like
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)	**Vapor Density:**	AP 3-4
Boiling Point:	85-437 °F (39-200 °C)	**Melting Point:**	ND
Solubility (H2O):	Negligible to Slight	**Specific Gravity:**	0.70-0.78
Evaporation Rate:	10-11	**VOC:**	ND
Percent Volatile:	100%	**Octanol/H2O Coeff.:**	ND
Flash Point:	-45 °F (-43 °C)	**Flash Point Method:**	PMCC
Upper Flammability Limit (UFL):	7.6%	**Lower Flammability Limit (LFL):**	1.4%
Burning Rate:	ND	**Auto Ignition:**	>530°F (>280°C)

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

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

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

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

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

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Gasoline, motor fuel (86290-81-5)

Inhalation LC50 Rat >5.2 mg/L 4 h; Oral LD50 Rat 14000 mg/kg; Dermal LD50 Rabbit >2000 mg/kg

Toluene (108-88-3)

Inhalation LC50 Rat 12.5 mg/L 4 h; Inhalation LC50 Rat >26700 ppm 1 h; Oral LD50 Rat 636 mg/kg; Dermal LD50 Rabbit 8390 mg/kg; Dermal LD50 Rat 12124 mg/kg

Butane (106-97-8)

Inhalation LC50 Rat 658 mg/L 4 h

Xylenes (o-, m-, p- isomers) (1330-20-7)
Inhalation LC50 Rat 5000 ppm 4 h; Inhalation LC50 Rat 47635 mg/L 4 h; Oral LD50 Rat 4300 mg/kg; Dermal LD50 Rabbit >1700 mg/kg

Benzene, 1,2,4-trimethyl- (95-63-6)
Inhalation LC50 Rat 18 g/m3 4 h; Oral LD50 Rat 3400 mg/kg; Dermal LD50 Rabbit >3160 mg/kg

Ethyl alcohol (64-17-5)
Oral LD50 Rat 7060 mg/kg; Inhalation LC50 Rat 124.7 mg/L 4 h

Ethylbenzene (100-41-4)
Inhalation LC50 Rat 17.2 mg/L 4 h; Oral LD50 Rat 3500 mg/kg; Dermal LD50 Rabbit 15354 mg/kg

Benzene (71-43-2)
Inhalation LC50 Rat 13050-14380 ppm 4 h; Oral LD50 Rat 1800 mg/kg

Hexane (110-54-3)
Inhalation LC50 Rat 48000 ppm 4 h; Oral LD50 Rat 25 g/kg; Dermal LD50 Rabbit 3000 mg/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

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

Potential Health Effects: Eye Critical Damage/ Stimulativeness

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

Potential Health Effects: Ingestion

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

Potential Health Effects: Inhalation

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

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

Respiratory Organs Sensitization/Skin Sensitization

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

Generative Cell Mutagenicity

This product may cause genetic defects.

Carcinogenicity

A: General Product Information

May cause cancer.

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

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

B: Component Carcinogenicity

Gasoline, motor fuel (86290-81-5)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

Toluene (108-88-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Ethyl alcohol (64-17-5)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC: Monograph 100E [in preparation] (in alcoholic beverages); Monograph 96 [2010] (in alcoholic beverages) (Group 1 (carcinogenic to humans))

Ethylbenzene (100-41-4)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC: Monograph 77 [2000] (Group 2B (possibly carcinogenic to humans))

Benzene (71-43-2)

ACGIH: A1 - Confirmed Human Carcinogen
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH: potential occupational carcinogen
NTP: Known Human Carcinogen (Select Carcinogen)
IARC: Monograph 100F [in preparation]; Supplement 7 [1987]; Monograph 29 [1982] (Group 1 (carcinogenic to humans))

Reproductive Toxicity

This product is suspected of damaging fertility or the unborn child.

Specified Target Organ General Toxicity: Single Exposure

This product may cause drowsiness or dizziness.

Specified Target Organ General Toxicity: Repeated Exposure

This product causes damage to organs through prolonged or repeated exposure.

Aspiration Respiratory Organs Hazard

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

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Very toxic to aquatic life with long lasting effects. Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Gasoline, motor fuel (86290-81-5)

Test & Species		Conditions
96 Hr LC50 Alburnus alburnus	119 mg/L [static]	
96 Hr LC50 Cyprinodon variegatus	82 mg/L [static]	
72 Hr EC50 Pseudokirchneriella subcapitata	56 mg/L	
24 Hr EC50 Daphnia magna	170 mg/L	

Toluene (108-88-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	15.22-19.05 mg/L [flow-through]	1 day old
96 Hr LC50 Pimephales promelas	12.6 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.89-7.81 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	14.1-17.16 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.8 mg/L [semi-static]	
96 Hr LC50 Lepomis macrochirus	11.0-15.0 mg/L [static]	
96 Hr LC50 Oryzias latipes	54 mg/L [static]	
96 Hr LC50 Poecilia reticulata	28.2 mg/L [semi-static]	
96 Hr LC50 Poecilia reticulata	50.87-70.34 mg/L [static]	
96 Hr EC50 Pseudokirchneriella subcapitata	>433 mg/L	
72 Hr EC50 Pseudokirchneriella subcapitata	12.5 mg/L [static]	
48 Hr EC50 Daphnia magna	5.46 - 9.83 mg/L [Static]	
48 Hr EC50 Daphnia magna	11.5 mg/L	

Xylenes (o-, m-, p- isomers) (1330-20-7)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	13.4 mg/L [flow-through]	

96 Hr LC50 Oncorhynchus mykiss	2.661-4.093 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	13.5-17.3 mg/L
96 Hr LC50 Lepomis macrochirus	13.1-16.5 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	19 mg/L
96 Hr LC50 Lepomis macrochirus	7.711-9.591 mg/L [static]
96 Hr LC50 Pimephales promelas	23.53-29.97 mg/L [static]
96 Hr LC50 Cyprinus carpio	780 mg/L [semi-static]
96 Hr LC50 Cyprinus carpio	>780 mg/L
96 Hr LC50 Poecilia reticulata	30.26-40.75 mg/L [static]
48 Hr EC50 water flea	3.82 mg/L
48 Hr LC50 Gammarus lacustris	0.6 mg/L

Benzene, 1,2,4-trimethyl- (95-63-6)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	7.19-8.28 mg/L [flow-through]
48 Hr EC50 Daphnia magna	6.14 mg/L

Ethyl alcohol (64-17-5)

Test & Species	Conditions
96 Hr LC50 Oncorhynchus mykiss	12.0 - 16.0 mL/L [static]
96 Hr LC50 Pimephales promelas	>100 mg/L [static]
96 Hr LC50 Pimephales promelas	13400 - 15100 mg/L [flow-through]
48 Hr LC50 Daphnia magna	9268 - 14221 mg/L
24 Hr EC50 Daphnia magna	10800 mg/L
48 Hr EC50 Daphnia magna	2 mg/L [Static]

Ethylbenzene (100-41-4)

Test & Species	Conditions
96 Hr LC50 Oncorhynchus mykiss	11.0-18.0 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	4.2 mg/L [semi-static]
96 Hr LC50 Pimephales promelas	7.55-11 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	32 mg/L [static]
96 Hr LC50 Pimephales promelas	9.1-15.6 mg/L [static]
96 Hr LC50 Poecilia reticulata	9.6 mg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	4.6 mg/L
96 Hr EC50 Pseudokirchneriella subcapitata	>438 mg/L
72 Hr EC50 Pseudokirchneriella subcapitata	2.6 - 11.3 mg/L [static]

96 Hr EC50 Pseudokirchneriella subcapitata	1.7 - 7.6 mg/L [static]
48 Hr EC50 Daphnia magna	1.8 - 2.4 mg/L

Benzene (71-43-2)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	10.7-14.7 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	5.3 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	22.49 mg/L [static]
96 Hr LC50 Poecilia reticulata	28.6 mg/L [static]
96 Hr LC50 Pimephales promelas	22330-41160 µg/L [static]
96 Hr LC50 Lepomis macrochirus	70000-142000 µg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	29 mg/L
48 Hr EC50 Daphnia magna	8.76 - 15.6 mg/L [Static]
48 Hr EC50 Daphnia magna	10 mg/L

Hexane (110-54-3)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	2.1-2.98 mg/L [flow-through]
24 Hr EC50 Daphnia magna	>1000 mg/L

Persistence/Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

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

Disposal of Contaminated Containers or Packaging

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

* * * Section 14 - Transportation Information * * *

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

DOT Information

Shipping Name: Gasoline
UN #: 1203 **Hazard Class:** 3 **Packing Group:** II
Placard:

* * * Section 15 - Regulatory Information * * *

Regulatory Information

A: Component Analysis

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

Toluene (108-88-3)
SARA 313: 1.0 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Xylenes (o-, m-, p- isomers) (1330-20-7)
SARA 313: 1.0 % de minimis concentration
CERCLA: 100 lb final RQ; 45.4 kg final RQ

Benzene, 1,2,4-trimethyl- (95-63-6)
SARA 313: 1.0 % de minimis concentration

Ethylbenzene (100-41-4)
SARA 313: 0.1 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Benzene (71-43-2)
SARA 313: 0.1 % de minimis concentration
CERCLA: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)

Hexane (110-54-3)

SARA 313: 1.0 % de minimis concentration
CERCLA: 5000 lb final RQ; 2270 kg final RQ

SARA Section 311/312 – Hazard Classes

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

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

State Regulations

Component Analysis - State

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

Component	**CAS**	**CA**	**MA**	**MN**	**NJ**	**PA**	**RI**
Gasoline, motor fuel	86290-81-5	No	No	No	No	Yes	No
Toluene	108-88-3	Yes	Yes	Yes	Yes	Yes	No
Butane	106-97-8	Yes	Yes	Yes	Yes	Yes	No
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	Yes	Yes	Yes	Yes	No
Benzene, 1,2,4-trimethyl-	95-63-6	No	Yes	Yes	Yes	Yes	No
Ethyl alcohol	64-17-5	Yes	Yes	Yes	Yes	Yes	No
Ethylbenzene	100-41-4	Yes	Yes	Yes	Yes	Yes	No
Benzene	71-43-2	Yes	Yes	Yes	Yes	Yes	No
Hexane	110-54-3	No	Yes	Yes	Yes	Yes	No

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

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

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Toluene	108-88-3	1 %
Butane	106-97-8	1 %
Benzene, 1,2,4-trimethyl-	95-63-6	0.1 %
Ethyl alcohol	64-17-5	0.1 %
Ethylbenzene	100-41-4	0.1 %
Benzene	71-43-2	0.1 %
Hexane	110-54-3	1 %

Additional Regulatory Information

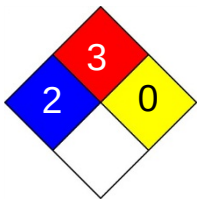
Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Gasoline, motor fuel	86290-81-5	No	DSL	EINECS
Toluene	108-88-3	Yes	DSL	EINECS
Butane	106-97-8	Yes	DSL	EINECS
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	DSL	EINECS
Benzene, 1,2,4-trimethyl-	95-63-6	Yes	DSL	EINECS
Ethyl alcohol	64-17-5	Yes	DSL	EINECS
Ethylbenzene	100-41-4	Yes	DSL	EINECS
Benzene	71-43-2	Yes	DSL	EINECS
Hexane	110-54-3	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	2
Fire	3
Reactivity	0



HMIS® Hazard Rating

Health	2	Moderate
Fire	3	Serious
Physical	0	Minimal
		*Chronic

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

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

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

End of Sheet

ATTACHMENT IV: COVID-19 Addendum

COVID-19 PROJECT PRACTICES

1 Purpose

To minimize the chance of viral infection when performing or conducting project related activities including field, office, and management functions

2 Scope

This program covers all OSC employees including field trades, managers, administration and management. OSC contractors/subcontractors are also included.

3 Responsibilities

3.1 Site Supervisor

Will ensure that all individuals working on OSC project sites are trained in these safe work practices, and that personnel follow the procedures. Supervisors must notify the Project Manager of unique hazards/exposures that may arise from OSC work, employees that call in sick, and employees that appear to be sick that do not stay home.

3.2 Employees/Subcontractors/Visitors

- All personnel must take steps to protect themselves from unnecessary exposure.
- If employees have symptoms of respiratory illness from COVID-19 (fever, loss of smell/taste, cough, shortness of breath), they must stay home and not come to work until free of symptoms. See section 5 below.
- Employees must notify their supervisor if they become sick and stay home. They must seek medical support if they develop the symptoms noted above. A COVID-19 test may be required before return to work is authorized.

4 Procedures

4.1 Each day, during the toolbox safety meeting employees must acknowledge that they have not had COVID-19 symptoms nor been in contact with anyone diagnosed with COVID-19 within the past 14 days. This will be noted on the Daily Safety Brief form.

4.2 Social Distancing; Work in occupied areas must be limited to what is necessary.

1. Limit physical contact with other. Keep at least 6 feet distance. Wear a face mask.

2. Limit out-of-office meetings and replace with phone/online meetings.

3. Take breaks and lunch in shifts to reduce the size of the group such that 6-foot distances may be kept.

4. All group meetings should be limited in size such that a 6-foot distance may be maintained.

5. Monitor co-employees for signs of illness and ask them to leave the site if symptoms are observed. Do not allow them to enter occupied areas. Report to the supervisor, site safety, or project manager as appropriate.

6. If concerned about an employee's health, notify the project manager who will arrange to take the employee's temperature. Note that not all those infected with COVID-19 have a temperature.

7. Activity Hazard Analysis (AHA) must be updated to account for COVID-19 exposure as needed. Tasks involving multiple people working in proximity in particular need to be evaluated.

8. If an employee is well but has a family member with COVID-19 they should notify their supervisor and not report to work until cleared to do so. A COVID-19 test may be required before return to work is authorized.

9. If an employee is confirmed to have COVID-19 inform the crew of the possible exposure but maintain confidentiality. Ask the infected employee to identify those who worked in close proximity (within 6 feet) before they depart the site.

10. Locker room / exiting the facility: only small groups shall leave at a time to avoid crowding. No standing bunched up at the exit shall be allowed. Keep distance.

11. Off road equipment shall not have passengers; no one in jump seats.

4.2 Personal Protective Equipment (PPE)

1. Gloves should be worn appropriate to the task. When not worn, hands must be washed/sanitized **frequently**.
2. Bandannas/masks have been provided and must be used to cover the nose and mouth whenever the six (6) foot distance cannot be maintained. When not required to be over the nose and mouth, the bandanna/mask may be worn around the neck, ready to be pulled up.
3. N95 or other face coverings may be used instead of the supplied bandannas/masks if they provide equivalent coverage.

4.3 Sanitation and Cleanliness

1. Wash hands frequently and thoroughly with soap and water for at least 20 seconds. Use hand sanitizer when hand washing facilities aren't available.
2. Refrain from touching the face. Wash hands often, **especially** before eating, smoking, or drinking, and after blowing your nose, coughing, or sneezing.
3. All job sites shall have hand washing stations readily available for all workers.
4. Hand sanitizer shall be used to supplement hand washing, not replace.
5. If on a remote site fill and Igloo-type water container with hot water (preferably) and label "Hand Washing Only". This is a good option for vehicles as well (i.e., project managers, superintendents).
6. Disinfect frequently touched surfaces within the workplace (i.e., trailers) multiple times a day. OSC will provide disinfectant. If necessary, employees may purchase and be reimbursed for providing hard-to-obtain supplies for company use.
7. Commonly touched surfaces to disinfect include doorknobs, keyboards, desks, eating surfaces).
8. Project site toilets should be cleaned by the leasing company **at least** twice per week (disinfected on the inside). Check that hand sanitizers are filled – if not, fill them. Disinfect door pulls and toilet seats frequently.
9. Job site offices/trailers and break/lunchrooms should be cleaned at least once per day.
10. Employees performing cleaning must use nitrile gloves and eye/face protection as needed.

11. Local project management should provide tissues and encourage employees to cover their noses and mouths with tissue for coughing, sneezing, or blowing noses. Again, wash hands after doing so.
12. Any trash from the trailers or job site should be changed frequently. Use gloves, throw away the gloves, and wash/disinfect hands when done.

4.4 Job Site Visitors

1. Restrict to the greatest extent practical the number of visitors to the site trailer/office.
2. Have visitors complete the OSC Self-Declaration form (attached). If they answer "yes" to any of the questions do **NOT** allow them site access.

4.5 Quarantine and Vaccination

Anyone who has had close contact (less than 6 feet distance for 15 minutes or more) with someone with COVID-19 must stay home for 10 days after their last exposure to that person. They may then return to work after also having a negative rapid and PCR test taken on day 7 of quarantine.

However, anyone who has had close contact with someone with COVID-19 and who meets the following criteria does NOT need to quarantine.

Someone who has been **fully vaccinated** and shows no symptoms of COVID

Or:

- Someone who has had COVID-19 within the previous 3 months *and*
- Has recovered *and*
- Remains without COVID-19 symptoms (for example, cough, shortness of breath)

4.6 Reporting

It is imperative that all potential exposures, known or suspected, be reported to the project manager who will in-turn report to the OSC President and/or Director, HSE.

5 Return to work (from the CDC)

I THINK OR KNOW I HAD COVID-19, AND I HAD SYMPTOMS

YOU CAN BE AROUND OTHERS AFTER:

- 10 DAYS SINCE SYMPTOMS FIRST APPEARED AND
- 24 HOURS WITH NO FEVER WITHOUT THE USE OF FEVER-REDUCING MEDICATIONS AND
- OTHER SYMPTOMS OF COVID-19 ARE IMPROVING

*LOSS OF TASTE AND SMELL MAY PERSIST FOR WEEKS OR MONTHS AFTER RECOVERY AND NEED NOT DELAY THE END OF ISOLATION

MOST PEOPLE DO NOT REQUIRE TESTING TO DECIDE WHEN THEY CAN BE AROUND OTHERS; HOWEVER, IF YOUR HEALTHCARE PROVIDER RECOMMENDS TESTING, THEY WILL LET YOU KNOW WHEN YOU CAN RESUME BEING AROUND OTHERS BASED ON YOUR TEST RESULTS.

NOTE THAT THESE RECOMMENDATIONS DO NOT APPLY TO PERSONS WITH SEVERE COVID-19 OR WITH SEVERELY WEAKENED IMMUNE SYSTEMS (IMMUNOCOMPROMISED). THESE PERSONS SHOULD FOLLOW THE GUIDANCE BELOW FOR "I WAS SEVERELY ILL WITH COVID-19 OR HAVE A SEVERELY WEAKENED IMMUNE SYSTEM (IMMUNOCOMPROMISED) DUE TO A HEALTH CONDITION OR MEDICATION.

I TESTED POSITIVE FOR COVID-19 BUT HAD NO SYMPTOMS

IF YOU CONTINUE TO HAVE NO SYMPTOMS, YOU CAN BE WITH OTHERS AFTER 10 DAYS HAVE PASSED SINCE YOU HAD A POSITIVE VIRAL TEST FOR COVID-19. MOST PEOPLE DO NOT REQUIRE TESTING TO DECIDE WHEN THEY CAN BE AROUND OTHERS; HOWEVER, IF YOUR HEALTHCARE PROVIDER RECOMMENDS TESTING, THEY WILL LET YOU KNOW WHEN YOU CAN RESUME BEING AROUND OTHERS BASED ON YOUR TEST RESULTS.

IF YOU DEVELOP SYMPTOMS AFTER TESTING POSITIVE, FOLLOW THE GUIDANCE ABOVE FOR "I THINK OR KNOW I HAD COVID-19, AND I HAD SYMPTOMS."

I WAS SEVERELY ILL WITH COVID-19 OR HAVE A SEVERELY WEAKENED IMMUNE SYSTEM (IMMUNOCOMPROMISED) DUE TO A HEALTH CONDITION OR MEDICATION. WHEN CAN I BE AROUND OTHERS?

PEOPLE WHO ARE SEVERELY ILL WITH COVID-19 MIGHT NEED TO STAY HOME LONGER THAN 10 DAYS AND UP TO 20 DAYS AFTER SYMPTOMS FIRST APPEARED. PERSONS WHO ARE SEVERELY IMMUNOCOMPROMISED MAY REQUIRE TESTING TO DETERMINE WHEN THEY CAN BE AROUND OTHERS. TALK TO YOUR HEALTHCARE PROVIDER FOR MORE INFORMATION. IF TESTING IS AVAILABLE IN YOUR COMMUNITY, IT MAY BE RECOMMENDED BY YOUR HEALTHCARE PROVIDER. YOUR HEALTHCARE PROVIDER WILL LET YOU KNOW IF YOU CAN RESUME BEING AROUND OTHER PEOPLE BASED ON THE RESULTS OF YOUR TESTING.

6 Training

All OSC employees and OSC on-site contractors shall be trained in this COVID-19 procedure immediately. Refresher training will be conducted on a monthly basis until the pandemic is determined to be over. Daily reminders/reinforcement of key considerations shall be given to project personnel through toolbox briefings.

ATTACHMENTS;

Daily Safety Brief

Self-Declaration Form

COVID-19 Self-Declaration Form – v3

The safety of our employees, customers, families and visitors remains OSC's overriding priority. As the coronavirus disease 2019 (COVID-19) outbreak continues to evolve and spreads globally, we are monitoring the situation closely and will periodically update company guidance based on current recommendations from the Center for Disease Control and the World Health Organization.

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 in this building. Thank you for your time.

Name:	Personal Phone Number (mobile/home):
Company/Organization:	OSC Point of Contact:
Facility/Project Name:	

If the answer is "yes" to any of the following questions, access to the facility will be denied.

	Self-Declaration
1	Have you had symptoms of a cold or flu (fever, cough, shortness of breath) within the last 14 days? ☐ Yes ☐ No If yes, what are the symptoms?
2	Have you had close contact with or cared for someone either diagnosed with COVID-19 or who has traveled to a foreign country within the last 14 days? ☐ Yes ☐ No

Signature:_____ Date: _____

Note: If any of your responses change, please advise your OSC point of contact immediately

Access to facility/project site (circle one): Approved Denied

Initials: _____

I hereby acknowledge my understanding of and commitment to follow the Ontario Specialty Contracting (OSC) COVID-19 work practices described below.

1. Should I develop COVID-19 respiratory symptoms (fever, cough, shortness of breath) or come in close contact with someone who has been diagnosed with COVID-19 I **will not** report to work but will notify OSC management of my situation.
2. I agree to limit physical contact with others by maintaining at least 6-feet distance. In cases where 6-feet of distance cannot be maintained I will cover my nose and mouth with a company provided (or equivalent) mask/bandanna.
3. I will wash my hands frequently and thoroughly with soap and water for at least 20 seconds and use hand sanitizer when hand washing isn't immediately feasible. I will refrain from touching my face and wash hands often, **especially** before eating, smoking, or drinking, and after blowing my nose, coughing, or sneezing.
4. I will disinfect frequently touched surfaces within the workplace multiple times throughout the day as is reasonable. OSC has provided disinfectant for this purpose. Commonly touched surfaces to disinfect include door handles, keyboards, and eating surfaces.
5. Break/lunch areas and common rooms must be cleaned using spray disinfectant as directed by supervision.

This Agreement is entered into by me in recognition that OSC has established these procedures necessary to minimize the chance of viral infection when performing or conducting work related activities.

[Employee name, signature, date]

Daily Safety Brief

Focused Safety Topic – _____

Attach focused safety topic material or use back of page for additional space "See Attached or Reverse" ➡

Summary of today's activities, identified hazards and protective measures.

ACTIVITIES: _____

_____

_____

EQUIPMENT REQUIRED: _____

_____

HAZARDS (circle, highlight or list): Traffic Struck by Caught Between/Pinched Head Eye Hand/Arm/Leg/Foot Slips/Trips/Falls Overhead/Drop Collapse/Cave-In Stored Energy Electrical/Shock Impalement Fire Weather Heat Cold Asphyxiation CO Lung Irritants Dust Asbestos LOPC Chemical PCB CO VOC's Gas Lightning Noise Vermin/Pests Rollover Other: _____

_____

PROTECTIVE MEASURES (circle, highlight or list): See Hot Work Permit See Confined Space Permit See AHA STAC MSDS Guards Barricades GFCI PPE Signs Spotter Alarms Warning Line Life Line Net Seat Belts ROP Shoring/Bracing Inspect "Auth. Stop Work" Fire Ext. Water/Misting Controlled Work Zone Ventilation Add Lighting Cones Covers De-energize Lockout/Tagout Air Gap Heat/Cold Stress Monitoring, Air Monitoring, Other/Remarks:

hand held radios/cell phones for communication, social distancing/hand washing/acknowledgement

APPROVED PPE REQUIRED (circle, highlight or list): Hardhat Safety Glasses Foot Protection Gloves High Visibility Vest or Equivalent High Visibility Clothing Hearing Protection Face Shield Mono-Goggles Respirator Special Protective Clothing (Burning Jacket & Shield, Gloves, Boots) Personal Fall Arrest/Restraint System Welding Hood Life Vest Metatarsals, Other: _____

Participants Print Name	Participants Print Name	Participants Print Name

Safety Talk Give by: _____ **DATE:** _____

Project/Location: _____

SAFETY

1. Have you had symptoms of a cold or flu (fever, cough, shortness of breath) within the last 14 days?
2. Have you had close contact with or cared for someone either diagnosed with COVD-19 or who has traveled to a foreign country within the last 14 days?
3. If coming out of quarantine, has it been at least 10 days with a negative PCR test on day 7?

Appendix B – Quality Assurance Project Plan

INVENTUM ENGINEERING, PC

Quality Assurance Project Plan

Riverview Innovation & Technology Campus, Inc.

Brownfield Cleanup Program Site No. 915353

3875 River Road

Tonawanda, NY 14150

February 7, 2023

441 CARLISLE DRIVE
SUITE C
HERNDON, VA 20170
WWW.INVENTUMENG.COM

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1 Introduction

The purpose of this Quality Assurance Project Plan (QAPP) is to serve as a guidance document during implementation of the Pre-design Investigation (PDRI) for the Riverview Innovation & Technology Campus (RITC), Brownfield Cleanup Program Site (BCP Site) located at 3875 River Road in Tonawanda, Erie County, New York. The PDRI is being conducted in accordance with the BCP Agreement (Index No. C915353-02-20) between the New York Statement Department of Environmental Conservation (NYSDEC) and Riverview dated February 14, 2020. The BCP Site is listed as Site Number C915353.

This QAPP is designed to provide an overview of Quality Assurance/Quality Control (QA/QC) procedures. Specific methods and QA/QC procedure for chemical testing of environmental samples obtained from the site as part of the RI Work Plan (RIWP) are defined.

An Inventum Engineering, P.C. (Inventum) Project Manager will be responsible for verifying that QA procedures are followed during the investigation and analysis. This will provide for the valid collection of representative samples. The Project Manager will be in direct contact with the analytical laboratory to ensure that holding times and other QA/QC requirements are met. The selected laboratory will be responsible for overseeing analytical QA/QC activities.

The estimated number of environmental samples and corresponding analytical parameters/methods are provided in Table 1 below. These sample quantities may vary depending on media availability and routine adjustments made during the field work.

Table 1 - Analytical Parameters and Methods

Parameter	Method Reference (a)	Groundwater	Soils	Clay Borrow	Grab Samples/Bench-scale Testing	Concrete (If Needed)
TCL Volatile Organic Compounds	8260C	19	6	16	6	4
TCL Semi-Volatile Organic Compounds	8270D	18	8	16	8	4
Polychlorinated Biphenyls	8082A		6	16		4
Pesticides	8081B		2	16		
Herbicides	8151A		2	16		
TAL Metals	6010C	10 (Total and Filtered)	8	16	8	4
Mercury	7470A	19	8	0	8	4
Cyanide	9012D	19	8	0	12	4
Ammonia	E350.1	18	7		7	
1,4 Dioxane	8270SIM			4		
Per- and Polyfluoroalkyl Substances	1633 (Draft)			4		
Toxicity Characteristic Leaching Procedure - Full List	1311				12	4
Total Organic Carbon	9060A				8	
Field Duplicates		1 per 20 Samples Collected	1 per 20 Samples Collected	1 per 20 Samples Collected	1 per 20 Samples Collected	
MS/MSD		1 per 20 Samples Collected	1 per 20 Samples Collected	1 per 20 Samples Collected		
Trip Blanks	8260	One per Volatile Shipment	N/A	N/A		
Rinsate (Equipment) Blanks		N/A	10% of Total Sampling Program for Non-Disposable Equipment	10% of Total Sampling Program for Non-Disposable Equipment	10% of Total Sampling Program for Non-Disposable Equipment	

(a) Laboratory should utilize the most recent version of the method # shown.

The analytical laboratory utilized will be a certified NYSDOH ELAP laboratory for the appropriates categories. The laboratory QA Manager will be responsible for performing project-specific audits and overseeing the quality control data generated.

2 Data Quality Objectives

Data Quality Objectives (DQOs) are qualitative and quantitative statements which specify the quality of data required to support the investigation of the Site. DQOs focus on the identification of the end use of the data to be collected. The project DQOs will be achieved utilizing the definitive data category, as outlined in Guidance for the Data Quality Objectives Process, EPA QA/G-4 (September 1994). All samples will provide definitive data, which are generated using rigorous analytical methods, such as the reference methods approved by the United States Environmental Protection Agency (USEPA). The purpose of this investigation is to establish a baseline of current conditions in order to aid in the development of an Alternatives Analysis (AA) for the BCP Site.

Within the context of the purpose stated above, the project DQOs for data collected during the pre-design investigation are:

- To assess the characteristics of groundwater for treatment.
- To assess the current extent of impacted fill below slabs in the former production area.
- To assess the current nature and extent of materials in areas proposed for rain garden and perimeter development.
- To assess the effectiveness of stabilization/solidification of viscous materials.

2.1 QA Objectives for Chemical Data Management

Sample analytical methodology for the media sampled and data deliverables will meet the requirements in the most recent NYSDEC Analytical Services Protocol (ASP). Laboratories will be instructed that completed Sample Preparation and Analysis Summary forms are to be submitted with the analytical data packages. The laboratory will also be instructed that matrix interferences must be cleaned up, to the extent practicable. Data Usability Summary Reports (DUSRs) will be generated. In order to achieve the definitive data category described above, the data quality indicators of precision, accuracy, representativeness, comparability, and completeness will be measured during offsite chemical analysis.

2.1.1 Precision

Precision examines the distribution of the reported values about their mean. The distribution of reported values refers to how different the individual reported values are from the average reported value. Precision may be affected by the natural variation of the matrix or contamination within that matrix, as well as by errors made in field and/or laboratory handling procedures. Precision is evaluated using analyses of a laboratory matrix spike/matrix spike duplicate (for organics) and matrix duplicates (for inorganics), which not only exhibit sampling and analytical precision, but indicate analytical precision through the reproducibility of the analytical results. Relative Percent Difference (RPD) is used to evaluate precision. RPD criteria must meet the method requirements identified in QAPP Section 6.1.

2.1.2 Accuracy

Accuracy measures the analytical bias in a measurement system. Sources of error are the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques. These data help to assess the potential concentration contribution from various outside sources. The laboratory objective for accuracy is to equal or exceeds the accuracy demonstrated for the applied analytical

methods on samples of the same matrix. The percent recovery criterion is used to estimate accuracy based on recovery in the matrix spike/matrix spike duplicate and matrix spike blank samples. The spike and spike duplicate, which will give an indication of matrix effects that may be affecting target compounds is also a good gauge of method efficiency.

2.1.3 Representativeness

Representativeness expresses the degree to which the sample data accurately and precisely represent the characteristics of a population of samples, parameter variations at a sampling point, or environmental conditions. Representativeness is a qualitative parameter, which is most concerned with the proper design of the sampling program or sub-sampling of a given sample. Objectives for representativeness are defined for sampling and analysis tasks and are a function of the investigative objectives. The sampling procedures have been selected with the goal of obtaining representative samples for the media of concern.

2.1.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. A DQO for this program is to produce data with the greatest practicable degree of comparability. This goal is achieved through using standard techniques to collect and analyze representative samples and reporting analytical results in appropriate units. Complete field documentation will support the assessment of comparability. Comparability is limited by the other parameters (e.g., precision, accuracy, representative-ness, completeness, comparability), because only when precision and accuracy are known can data sets be compared with confidence. In order for data sets may be comparable, it is imperative that contract-required methods and procedures be explicitly followed.

2.1.5 Completeness

Completeness is defined as a measure of the amount of valid data obtainable from a measurement system compared to the amount that was expected to be obtained under normal conditions. It is important that appropriate QA procedures be maintained to verify that valid data are obtained in order to meet project needs. For the data generated, a goal of 90% is required for completeness (or usability) of the analytical data. If this goal is not met, then NYSDEC, Inventum, and Riverview project personnel will determine whether the deviations might cause the data to be rejected.

3 Sampling Locations, Custody, Holding Times, and Analysis

Samples locations and procedures are discussed in the RI Scope of Work and the accompanying Tables and Figures of the BCP Site RIWP. Procedures for chain of custody, holding times and laboratory analyses shall be followed as per SW-846 and as per the laboratory's Quality Assurance Plan. All holding times begin with validated time of sample receipt (VTSR) at the laboratory. The laboratory must meet the method required detection limits which are referenced within the EPA Methods (QAPP Table 1).

In addition, for the emerging contaminants, the laboratory must meet the detection limits for PFAS specified in the NYSDEC's January 2020 *Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Remedial Programs* and 0.28 micrograms per liter (µg/L) for 1,4-Dioxane.

4 Calibration Procedures and Frequency

In order to obtain a high level of precision and accuracy during sample processing procedures laboratory instruments must be calibrated property. Several analytical support areas must be considered so the integrity of standards and reagents is upheld prior to instrument calibration. The following section describe the analytical support areas and laboratory instrument calibration procedures.

4.1 Analytical Support Areas

Prior to generating quality data, several analytical support areas must be considered; these are detailed in the following paragraphs.

- Standard/Reagent Preparation - Primary reference standards and secondary standard solutions shall be obtained from National Institute of Standards and Technology (NIST), or other reliable commercial sources to verify the highest purity possible. The preparation and maintenance of standards and reagents will be accomplished according to the methods referenced. All standards and standard solutions are to be formally documented (i.e., in a logbook) and should identify the supplier, lot number, purity/concentration, receipt/preparation date, preparers name, method of preparation, expiration date, and any other pertinent information. All standard solutions shall be validated prior to use. Care shall be exercised in the proper storage and handling of standard solutions (e.g., separating volatile standards from nonvolatile standards). The laboratory shall continually monitor the quality of the standards and reagents through well documented procedures.

- Balances - The analytical balances shall be calibrated and maintained in accordance with manufacturer specifications. Calibration is conducted with two Class AS" weights that bracket the expected balance use range. The laboratory shall check the accuracy of the balances daily and they must be properly documented in permanently bound logbooks.

- Refrigerators/Freezers - The temperature of the refrigerators and freezers within the laboratory shall be monitored and recorded daily. This will verify that the quality of the standards and reagents is not compromised, and the integrity of the analytical samples is upheld. Appropriate acceptance ranges (2 to 6°C for refrigerators) shall be clearly posted on each unit in service.

- Water Supply System - The laboratory must maintain a sufficient water supply for all project needs. The grade of the water must be of the highest quality (analyte-free) in order to eliminate false-positives from the analytical results. Ultraviolet cartridges or carbon absorption treatments are recommended for organic analyses and ion-exchange treatment is recommended for inorganic tests. Appropriate documentation of the quality of the water supply system(s) will be performed on a regular basis.

4.2 Laboratory Instruments

Calibration of instruments is required to verify that the analytical system is operating properly and at the sensitivity necessary to meet established quantitation limits. Each instrument for organic and inorganic analyses shall be calibrated with standards appropriate to the type of instrument and linear range established within the analytical method(s). Calibration of laboratory instruments will be performed according to specified methods.

In addition to the requirements stated within the analytical methods, the contract laboratory will be required to analyze an additional low-level standard at or near the detection limits. In general, standards will be used that bracket the expected concentration of the samples. This will require the use of different concentration levels, which are used to demonstrate the instrument's linear range of calibration.

Calibration of an instrument must be performed prior to the analysis of any samples and then at periodic intervals (continuing calibration) during the sample analysis to verify that the instrument is still calibrated. If the contract laboratory cannot meet the method required calibration requirements, corrective action shall

be taken as discussed in QAPP Section 7. All corrective action procedures taken by the contract laboratory are to be documented, summarized within the case narrative, and submitted with the analytical results.

5 Internal Quality Control Checks

Internal QC checks are used to determine if analytical operations at the laboratory are in control, as well as determining the effect sample matrix may have on data being generated. Two types of internal checks are performed and are described as batch QC and matrix-specific QC procedures. The type and frequency of specific QC samples performed by the contract laboratory will be according to the specified analytical method and project specific requirements. Acceptable criteria and/or target ranges for these QC samples are presented within the referenced analytical methods.

QC results which vary from acceptable ranges shall result in the implementation of appropriate corrective measures, potential application of qualifiers, and/or an assessment of the impact these corrective measures have on the established data quality objectives. Quality control samples including any project-specific QC will be analyzed are discussed below.

5.1 Batch QC

Method Blanks - A method blank is defined as laboratory-distilled or deionized water that is carried through the entire analytical procedure. The method blank is used to determine the level of laboratory background contamination. Method blanks are analyzed at a frequency of one per analytical batch.

Matrix Spike Blank Samples - A matrix spike blank (MSB) sample is an aliquot of water spiked (fortified) with all the elements being analyzed for calculation of precision and accuracy to verify that the analysis that is being performed is in control. An MSB will be performed for each matrix and organic parameter only.

5.2 Matrix-Specific QC

Matrix Spike Samples - An aliquot of a matrix is spiked with known concentrations of specific compounds as stipulated by the methodology. The matrix spike (MS) and matrix spike duplicate (MSD) are subjected to the entire analytical procedure in order to assess both accuracy and precision of the method for the matrix by measuring the percent recovery and relative percent difference of the two spiked samples. The samples are used to assess matrix interference effects on the method, as well as to evaluate instrument performance. MS/MSDs are analyzed at a frequency of one each per 20 samples per matrix.

Matrix Duplicates - The matrix duplicate (MD) is two representative aliquots of the same sample which are prepared and analyzed identically. Collection of duplicate samples provides for the evaluation of precision both in the field and at the laboratory by comparing the analytical results of two samples taken from the same location. Obtaining duplicate samples from a soil matrix requires homogenization (except for volatile organic compounds) of the sample aliquot prior to filling sample containers, in order to best achieve representative samples. Every effort will be made to obtain replicate samples; however, due to interferences, lack of homogeneity, and the nature of the soil samples, the analytical results are not always reproducible.

Rinsate (Equipment) Blanks - A rinsate blank is a sample of laboratory demonstrated analyte free water passed through and over the cleaned sampling equipment. A rinsate blank is used to indicate potential contamination from ambient air and from sample instruments used to collect and transfer samples. This water must originate from one common source within the laboratory and must be the same water used by the laboratory performing the analysis. The rinsate blank should be collected, transported, and analyzed in the same manner as the samples acquired that day. Rinsate blanks for nonaqueous matrices should be performed at a rate of 10 percent of the total number of samples collected throughout the sampling event. Rinse blanks will not be performed on samples (i.e., groundwater) where dedicated disposable equipment is used.

Trip Blanks - Trip blanks are not required for nonaqueous matrices. Trip blanks are required for aqueous sampling events. They consist of a set of sample bottles filled at the laboratory with laboratory demonstrated analyte free water. These samples then accompany the bottles that are prepared at the lab into the field and back to the laboratory, along with the collected samples for analysis. These bottles are never opened in the field. Trip blanks must return to the lab with the same set of bottles they accompanied to the field. Trip blanks will be analyzed for volatile organic parameters. Trip blanks must be included at a rate of one per volatile sample shipment.

6 Calculation of Data Quality Indicators

6.1 Precision

Precision is evaluated using analyses of a field duplicate and/or a laboratory MS/MSD which not only exhibit sampling and analytical precision but indicate analytical precision through the reproducibility of the analytical results. RPD is used to evaluate precision by the following formula:

$$RPD = \frac{(X1 - X2) \times 100\%}{[(X1 + X2)/2]}$$

Where:

X1= Measured value of sample or matrix spike
X2= Measured value of duplicate or matrix spike duplicate
Precision will be determined through the use of MS/MSD (for organics) and matrix duplicates (for inorganics) analyses.

6.2 Accuracy

Accuracy is defined as the degree of difference between the measured or calculated value and the true value. The closer the numerical value of the measurement comes to the true value or actual concentration, the more accurate the measurement is. Analytical accuracy is expressed as the percent recovery of a compound or element that has been added to the environmental sample at known concentrations before analysis. Analytical accuracy may be assessed through the use of known and unknown QC samples and spiked samples. It is presented as percent recovery. Accuracy will be determined from matrix spike, matrix spike duplicate, and matrix spike blank samples, as well as from surrogate compounds added to organic fractions (i.e., volatiles, semi volatiles, PCB), and is calculated as follows:

$$\text{Accuracy (\%R)} = \frac{(Xs - Xu) \times 100\%}{K}$$

Where:

Xs- Measured value of the spike sample
Xu- Measured value of the unspiked sample
K - Known amount of spike in the sample

6.3 Completeness

Completeness is calculated on a per matrix basis for the project and is calculated as follows:

$$\text{Completeness (\%C)} = \frac{(Xv - Xn) \times 100\%}{N}$$

Where:

Xv- Number of valid measurements
Xn- Number of invalid measurements
N - Number of valid measurements expected to be obtained

7 Corrective Actions

Laboratory corrective actions shall be implemented to resolve problems and restore proper functioning to the analytical system when errors, deficiencies, or out-of-control situations exist at the laboratory. Full documentation of the corrective action procedure needed to resolve the problem shall be filed in the project records, and the information summarized in the case narrative. A discussion of the corrective actions to be taken is presented in the following sections.

7.1 Incoming Samples

Problems noted during sample receipt shall be documented by the laboratory. The Inventum Project Manager shall be contacted immediately for problem resolution. All corrective actions shall be documented thoroughly.

7.2 Sample Holding Times

If any sample extraction and/or analyses exceed method holding time requirements, the Inventum Project Manager shall be notified immediately for problem resolution. All corrective actions shall be documented thoroughly.

7.3 Instrument Calibration

Sample analysis shall not be allowed until all initial calibrations meet the appropriate requirements. All laboratory instrumentation must be calibrated in accordance with method requirements. If any initial/continuing calibration standards exceed method QC limits, recalibration must be performed and, if necessary, reanalysis of all samples affected back to the previous acceptable calibration check.

7.4 Reporting Limits

The laboratory must meet the method required detection limits listed in NYSDEC ASP, 10/95 criteria. If difficulties arise in achieving these limits due to a particular sample matrix, the laboratory must notify Inventum personnel for problem resolution. In order to achieve those detection limits, the laboratory must utilize all appropriate cleanup procedures in an attempt to retain the project required detection limits. When any sample requires a secondary dilution due to high levels of target analytes, the laboratory must document all initial analyses and secondary dilution results. Secondary dilution will be permitted only to bring target analytes within the linear range of calibration. If samples are analyzed at a secondary dilution with no target analytes detected, the Project Manager will be immediately notified so that appropriate corrective actions can be initiated.

7.5 Method QC

All QC method-specified QC samples shall meet the method requirements referenced in the analytical methods. Failure of method-required QC will result in the review and possible qualification of all affected data. If the laboratory cannot find any errors, the affected sample(s) shall be reanalyzed and/or re-extracted/redigested, then reanalyzed within method-required holding times to verify the presence or absence of matrix effects. If matrix effect is confirmed, the corresponding data shall be flagged accordingly using the flagging symbols and criteria. If matrix effect is not confirmed, then the entire batch of samples may have to be reanalyzed and/or re-extracted/redigested, then reanalyzed. Inventum shall be notified as soon as possible to discuss possible corrective actions should unusually difficult sample matrices be encountered.

7.6 Calculation Errors

All analytical results must be reviewed systematically for accuracy prior to submittal. If upon data review calculation and/or reporting errors exist, the laboratory will be required to reissue the analytical data report with the corrective actions appropriately documented in the case narrative.

8 Data Reduction, Validation, and Usability

8.1 Data Reduction

Laboratory analytical data are first generated in raw form at the instrument. These data may be either in a graphic or printed tabular format. Specific data generation procedures and calculations are found in each of the referenced. Analytical results must be reported consistently. Identification of all analytes must be accomplished with an authentic standard of the analyte traceable to NIST or USEPA sources. Individuals experienced with a method's particular analysis and knowledgeable of requirements will perform data reduction.

8.2 Data Validation

Data validation is a systematic procedure of reviewing a body of data against a set of established criteria to provide a specified level of assurance of validity prior to its intended use. All analytical samples collected will receive a limited data review. The data validation will be limited to a review of holding times and completeness of all required deliverables.

Where possible, discrepancies will be resolved by the project manager (i.e., no letters will be written to laboratories). A complete analytical data validation is not anticipated. However, if the initial limited data audit reveals significant deviations and problems with the analytical data, project personnel may recommend a complete validation of the data.

9 References

- Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Quality Assurance Manual, Final Copy, Revision I, October 1989.
- National Enforcement Investigations Center of USEPA Office of Enforcement. NEIC Policies and Procedures. Washington: USEPA.
- New York State Department of Environmental Conservation (NYSDEC). 1995. Analytical Services Protocol, (ASP) 10/95 Edition. Albany: NYSDEC.

Appendix C – Community Air Monitoring Plan

INVENTUM ENGINEERING, PC

Community Air Monitoring Plan

Riverview Innovation & Technology Campus

Brownfield Cleanup Program Site No. C915353

3875 River Road

Tonawanda, NY 14150

March 12, 2020

Rev. 2: January 15, 2021

Rev. 3 January 22, 2021

Rev. 4 November 8, 2021

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1 Overview

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.

- *The Riverview Site will have a perimeter air monitoring program before and during the RI. If there are detections at the property line, additional monitoring requirements will be considered*[1].
- *Three (3) perimeter air monitoring units (1 Upwind and 2 Downwind) were installed on the BCP Site on April 29, 2020. Monitoring locations are shown on the Figure provided in Appendix D-2.*

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.

- *There are no sensitive receptors on the property. The closest residence is more than 0.25 miles away from the property boundary.*

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

2 Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for 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 DEC/NYSDOH staff.

[1] The text in *italic font* are comments inserted by Riverview in addition to the standard CAMP Template.

- *VOC and particulate monitoring will be incorporated into the RI and IRM activities.*

Continuous monitoring will be required for all ground intrusive activities during the demolition of contaminated or potentially contaminated structures, installing groundwater conveyance trenches, operation of a groundwater treatment system when housed indoors, and during the decontamination and deconstruction of Above Ground Storage Tanks (ASTs). 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. Decontamination and deconstruction of ASTs include, but are not limited to, removal of residual products, decontamination of ASTs and ancillary piping and equipment, and emptying and decontamination of secondary containment structures.

VOC monitoring during operation of the groundwater treatment system when housed indoors will be by completed a photoionization detector or PID. For the groundwater treatment system to be housed the former maintenance building, two PIDs will be positioned near the largest open top tank which will be the WetSep. The PIDs will be set to alarm at 5 parts per million (ppm) for any 15-minute period based on the potential Benzene exposure. Actions described in Section 3 will be implemented if 5ppm for 15 minutes is observed. Downwind monitoring will not occur because the work being monitored is indoors.

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.

- *During sampling periodic monitoring will be implemented with hand-held instruments.*

3 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, particularly if wind direction changes. 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.

1. 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.

2. 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.

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

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

5. The NYSDEC and NYSDOH project managers will be notified there is an exceedance of the VOC action levels.

4 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.

1. 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/m3 above the upwind level and provided that no visible dust is migrating from the work area.

2. 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.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

4. The NYSDEC and NYSDOH project managers will be notified where there is an exceedance of the CAMP particulate monitoring action levels.

5 Controlled Demolition with Asbestos

The four controlled demolition buildings have been designated because they were either not safe for entry by the Asbestos Containing Material (ACM) inspection contractor (BCP-14, BCP-66 and BCP-68) or that contain loose asbestos packing that cannot be safely removed (BCP-56). These buildings will be

demolished in place and the resulting demolition materials will be inspected and sampled after they are safely on the ground.

The demolition with ACM present will be preformed in accordance with NYS Code, Rules and Regulations Section 56-11.5(a)(b)(c). Required dust control measure of Section 56-11.5 will consist of:

1. Air sampling for asbestos at the upwind and downwind perimeter of the building work area will be conducted daily during activities including demolition, abatement, and cleaning.

2. All debris generated by the demolition shall be considered to be asbestos contaminated waste, except for structural members, steel components and similar non-suspect items which shall be fully decontaminated as per this Part, until sample results are available indicating ACM is not present.

3. The demolition waste shall be wetted on a continuous basis that is prior to, during and subsequent to its actual collection and removal. Fog nozzles or similar type of equipment shall be used to perform the wetting.

4. Wetted piles of waste. Piles of waste not actively being worked on, *i.e.*, piles being added to or portions being removed or piles left over extended periods of time, shall be covered with at least one layer of six mil polyethylene to retain its moisture level and to prevent fiber release.

5. Wetted piles of waste. Piles of waste not actively being worked on, *i.e.*, piles being added to or portions being removed or piles left over extended periods of time, shall be covered with at least one layer of six mil polyethylene to retain its moisture level and to prevent fiber release.

Appendix A-1
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;

(b) Measurement Ranges: 0.001 to 400 mg/m^3 (1 to 400,000 :ug/m^3);

(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m^3 for one second averaging; and +/- 1.5 g/m^3 for sixty second averaging;

(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);

(e) Resolution: 0.1% of reading or 1g/m^3, whichever is larger;

(f) Particle Size Range of Maximum Response: 0.1-10;

(g) Total Number of Data Points in Memory: 10,000;

(h) Logged Data: Each data point with average concentration, time/date and data point number

(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;

(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;

(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;

(l) Operating Temperature: -10 to 50^o C (14 to 122^o F);

(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m^3 (15 minutes average). While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m^3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m^3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m^3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential-- such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads and demolitions;

(b) Wetting equipment and excavation faces;

(c) Spraying water on buckets during excavation and dumping;

(d) Hauling materials in properly tarped or watertight containers;

(e) Restricting vehicle speeds to 10 mph;

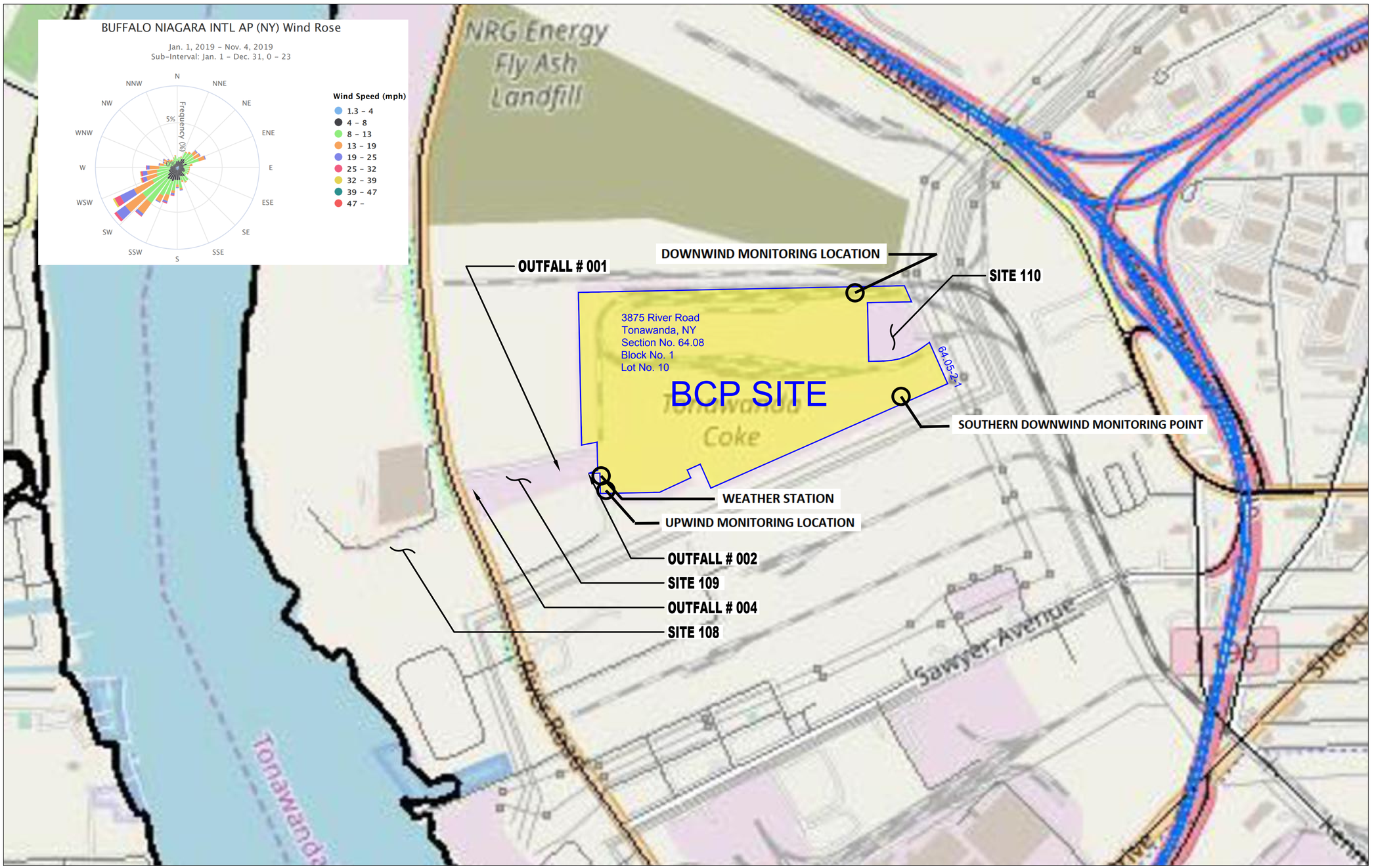
(f) Covering excavated areas and material after excavation activity ceases; and

(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m^3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Appendix A-2
Perimeter Air Monitoring Locations



Erie County, New York, Interactive Mapping Viewer, www2.erie.gov/gis

64.08-1-10 Section No., Block No., Lot No. (SBL)

Brownfield Area

D

500 0 100 200 600 1000

1 INCH = 350 FEET (22X34)

DRAWING BY

CHECKED

APPROVED

BAESLINE AIR MONITORING STATIONS

SITE LOCATION MAP

RIVERVIEW INNOVATION & TECHNOLOGY CAMPUS, INC.

3875 RIVER ROAD
TONAWANDA, NEW YORK 14150

INVENTUM ENGINEERING
481 CARLISLE DRIVE
SUITE 202
HERNDON, VIRGINIA 20170
(703) 722-6049
www.InventumEng.com

FIGURE 3

DRAWING NUMBER

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