Environmental Work Plan

For

Fire Hydrant Replacement Project

Hunts Point Cooperative Market, Inc.

355 Food Center Drive

Bronx, New York 10474

Prepared for:

Hunts Point Cooperative Market, Inc.

355 Food Center Drive

Bronx, New York 10474

Prepared by:

NYCO Environmental & Dewatering Corp.

200 Blydenburg Road, Suite 19

Islandia, New York 11749

NOVEMBER 2018

TABLE OF CONTENTS

FIGURES

Figure 1 – Site Location Map

APPENDICES

Appendix 1 – Site Specific Health and Safety Plan (HASP)

Appendix 2 – Yard Hydrant Study (Goldman Copeland, April 12, 2018)

Appendix 3 – Drawing C-100.00 – Site Plan Notes, Legend, and Details (Goldman Copland, October 24, 2018)

Appendix 4 – Disposal Facility Acceptance Criteria and Permits:

1. *Clean Earth of Southeast Pennsylvania (Morrisville)*

1.0 INTRODUCTION

This Environmental Work Plan (EWP) and Health and Safety Plan (HASP) has been developed for the Fire Hydrant Replacement Project (FHRP) located at 355 Food Center Drive in the Hunts Point section of Bronx, New York. This EWP describes the parties involved with the FHRP, and the proposed procedures that will address the environmental concerns associated with the possible exposure to historical contamination previously identified on the Hunts Point Peninsula. The site-specific HASP (**Appendix 1**) addresses potential hazards, contaminants of concern based on past use and safety requirements associated with excavation activities in accordance with ASTM and OSHA guidelines.

1.1 Site Location and Current Usage

Hunt's Point Cooperative Market, Inc. (HPCM) is located at 355 Food Center Drive, Bronx, New York (the "Site"). **Figure 1** is a location map depicting the Site at within the Hunts Point area. The Site is comprised of a 60 acre facility, occupied by a Coop of companies that process and distribute food for the New York City Metropolitan Area. A recent Yard Hydrant Study, prepared by Goldman Copland Consulting Engineers (GOCO, April 12, 2018), examined HPCM's existing fire service system with specific attention paid to the fire service mains and hydrants. The conclusion of this study was that HPCM will need to update the fire hydrant system. The Yard Hydrant Study has been included with this EWP as **Appendix 2**. Specific locations of the 26 Fire Hydrants subject to replacement can be seen at the end of the Yard Hydrant Study on the marked up Brand & More Site Plan, Drawing P-1 (**Appendix 2**).

The Site is located on property currently owned by the New York City Economic Development Corporation (NYCEDC), who has signed a Brownfield Cleanup Agreement (BCA) with New York Department of Environmental Conservation (NYSDEC). As part of this BCA, the NYCEDC is performing an environmental site assessment, to be completed by their environmental consultant GEI Consultants, Inc. (GEI). The BCA assessment work completed by NYCEDC is separate from the FHRP. However, there are provisions of the BCA that effect the FHRP and associated excavation or soil disturbance. This Environmental Work Plan is meant to address the provisions, outline proper procedures, and enforcement by an environmental consultant hired by HPCM.

1.2 Proposed Fire Hydrant Replacement

HPCM's fire services are tapped off a common 20-inch cold water main, below Food Center Drive. This service is distributed throughout the site to a total of 26 fire hydrants. The April 12, 2018 study noted that the condition of the 26 fire hydrants vary in quality, and recommended that they be replaced with added bollards in accordance with design criteria and speciation's presented in Section 2 of the GOCO's Yard Hydrant Study, see **Appendix 2**. GOCO has also provided a Site Plan for the FHRP, which includes notes and details to be followed during construction. This site plan is designated Drawing C-100.00, and is included in the EWP as **Appendix 3**. This EWP focuses on the environmental implications of the FHRP, and outlines protocol to ensure that work is conducted in compliance with the requirements and regulations of both New York City Economic Development Corporation (NYCEDC) and New Your State Department of Environmental Conservation (NYSDEC).

1.3 Project Organization and Responsibilities

The key project team members involved with environmental implications of the FHRP and their responsibilities has been outlined in the following table:

Project Team	Project Role	Personnel	Contact Information
Hunts Point Cooperative Market Inc. (HPCM)	Operator/ Tennent	Bruce Reingold	breingold@huntspointmkt.com PH: 718-842-7466
		Nick Hill	nhill@huntspointmkt.com PH: 718-328-0179
Greenberg Traurig, LLP	HPCM Legal Representative	Warren Karp	karpw@gtlaw.com PH: 212-801-6824
NYCO Environmental & Dewatering Corp. (NYCO)	HPCM Environmental Consultant	Sam McTavey	sam@nycoenv.com PH: 914-643-1057
		Matt Durcan	mdurcan@nycoenv.com PH: 631-786-3323
Goldman Copeland	HPCM Consulting Engineer	Daniel Colombini	PH: 718-961-6634
Fresh Meadow Mechanical Plumbing, LLC (FMMP)	HPCM Contractor	Michael Burns	PH: 718-961-6634

Project Team	Project Role	Personnel	Contact Information
New York City Economic Development Corporation (NYCEDC)	City Owner's Representative	Tracy Bell	tbell@edc.nyc PH: 914-643-1057
GEI Consultants Inc.	EDC's Environmental Consultant	Kevin McCarty	kmccarty@geiconsultants.com PH: 212-645-9965

HPCM team members will be responsible for the implementation and execution of the FHRP in accordance with the design and specifications identified in the Yard Hydrant Study and Drawing C-100.00 (**Appendices 2** and **3**), and the environmental practices outlined in this EWP. Contractors hired by HPCM shall be responsible for managing their project elements, including their subcontractors, to ensure compliance with the project specifications and this EWP. Contractors are also responsible for verifying that their activities are in compliance with applicable federal, state, and local rules and regulations, as well as project health and safety requirements. As HPCM's Environmental Consultant, NYCO shall be tasked with environmental monitoring and reporting for all activities associated with ground penetration, and ensure that work is performed in accordance with the is EWP.

1.4 Environmental Related Correspondence and Reporting

Project correspondence and reporting completed by HPCM's Environmental Consultant (NYCO) related to potentially hazardous substances, contamination, the handling/storage/disposal of excavated soils, quality of soil/groundwater/air during phases of the FRHP shall be considered environmental related correspondence. While the majority of this correspondences will be between NYCO and representative of the HPCM, at no time shall NCYO contact the NYSDEC without prior consent of NYCEDC. If impacted material is encountered during the project, NYCO shall distribute environmental related correspondence to both HPCM and NYCEDC for review and comment. Upon concurrence of how to proceed, the results of the review and comment shall be distributed to regulatory agencies accordingly.

2.0 MATERIALS MANAGEMENT

Site work relating to excavation, handling, backfilling, and disposal of project soil or groundwater (if encountered), shall be managed in accordance with practices outlined in this section.

2.1 Soil Screening

Visual, olfactory, and instrument-based (e.g. photoionization detector) soil screening of excavated material shall be performed by the environmental technician (NYCO) to determine if the soil is grossly impacted. Grossly impacted soils shall be defined as soils containing free phase non-aqueous petroleum liquid (NAPL), or manufactured gas plant (MGP) waste (e.g. coal tar, or purifier waste). Examination shall be performed during excavation and invasive work performed during Project construction activities. Soil screening observations made by the environmental technician shall be logged in a field book and reported as required.

If evidence of impacts (e.g. NAPL, MGP Waste, discolored soils, or similar indicators) is noted during the soil screening of excavation work, HPCM and NYCEDC shall be notified. Additional soil screening measures shall be employed following the identification of impacts, and grossly impacted soils shall be stockpiled in a designated area and scheduled for waste characterization sampling and disposal to a facility permitted to accept the impacted soils.

2.2 Excavation and Backfilling of Soils

Excavation in the project area shall be conducted using conventional excavating equipment. The excavation contractor shall be responsible for the identification of all utilities, and shall complete a subsurface utility “one call” mark out prior to excavation. Excavated soils shall be temporarily staged adjacent to the active excavation and screened by the on-site environmental technician.

Soils that exhibit grossly contaminated characteristics shall be segregated from soils that are acceptable for backfill, and staged in accordance with the stockpiling and segregation practices outlined in Section 2.4.

2.3 Re-use of Excavated Materials

Soils excavated on the Project premises, stockpiled, and that are determined not to be grossly impacted per the screening methods described in Section 2.1, shall be allowed to be used at the

Site as backfill material. The material shall be allowed to be placed in the general area from which it was initially excavated, or excavations existing on the premises. Loading, movement, and staging of this material shall be reviewed and documented by NYCO and in accordance with the procedures previously outlined in within this Section.

2.4 Soil Stockpiling and Segregation

Project excavation of soils and subsequent stockpiling and segregation shall be performed in compliance with applicable local, state, and federal laws and regulations. It is expected that the following guidelines shall be followed:

- Soil screening of excavated soils shall be assessed as outlined in Section 2.1;
- Soils may be stockpiled adjacent to the excavation or transported to a soil staging area;
- Soil exhibiting evidence of gross impacts shall be stockpiled separately from soils which show no evidence of gross impacts;
- Any soils showing evidence of gross impacts shall not be used as backfill;
- Soils stockpiled for reuse on-site shall be screened by an environmental technician, and meet the project specifications for backfill;
- Grossly impacted soils stockpiled for off-site disposal shall be tested in accordance with the disposal facility and NYCEDC requirements. Samples of the stockpile shall be collected at the frequency specified the disposal facility and NYCEDC requirements. Laboratory analysis shall be conducted at a New York State ELAP certified Laboratory.

Soil stockpiles and the soil stockpile areas shall be subject to erosion and sediment control practices which have been designated and constructed in accordance with FHRP specifications and design documents. Sediment control practices are to be installed prior to any major soils disturbances and maintained until permanent protection is established. Care shall be taken to avoid stockpiling soils to be used for backfilling adjacent to stormwater inlets, to avoid release of sediment into the active on-site storm drainage systems.

Grossly impacted soils shall be stockpiled in a designated containment area prior to off-site disposal. Stockpile containment for grossly impacted soils shall be construction of a bottom layer of 6-mil polyethylene plastic sheeting placed under the stockpile then draped over continuous 8-

inch x 8-inch timbers, or equivalent berm structure, and surround the perimeter of the stockpile. Each pile shall be covered with 6-mil polyethylene plastic sheeting which shall be weighted and secured using suitable ballast to prevent any winds from removing the sheeting. If present, contaminated water draining form the soils shall be collected from inside the berm and placed in either a 55-gallon drum or appropriately sized holding tank. Rainwater collecting on top of the plastic sheeting shall not require disposal unless it comes in contact with grossly contaminated material. Contaminated liquid shall ultimately be disposed off-site an approved facility permitted to accept the waste.

2.5 Waste Characterization Sampling

Project construction activities shall include multiple excavations throughout the Site, which shall generate soils subject to waste characterization sampling prior to off-site disposal. Typical waste characterization sampling for the Project has been summarized below:

- Waste characterization samples for soils requiring off-site disposal shall be analyzed using the disposal facility required sampling protocol and frequency.
- Soil sampling frequency shall typically be one composite sample (created from a minimum of 5 discrete samples from representative locations) of stockpiled soil; a discrete VOC sample will be collected in accordance with disposal facility requirements.
- Soil sampling frequency for waste characterization sampling shall be in accordance with the selected waste disposal facility requirements, or at more stringent frequency requested by the NYCEDC.

Upon receipt of the analytical data from the laboratory, NYCO shall compile a waste disposal approval package to be reviewed by the targeted disposal facility. The disposal facility shall then provide an approval letter accepting the material. Prior to disposal, the entire package shall be presented to the project team for their records. No material shall leave the site until the NYCEDC has reviewed the disposal facility documentation.

2.6 Waste Disposal Approval

NYCO shall manage all waste disposal plans and approvals on behalf of HPCM. Waste Disposal submittals shall be sent to the project team via email and shall include, but are not limited to, the following:

- Generator Waste Profiles
- Waste Characterization laboratory data, tabulations, and figures.
- Waste Disposal Facilities and their Permits
- Waste Haulers and their Permits
- Disposal Facility Acceptance Letters

The following process shall be implemented for obtaining waste disposal approval:

- NYCO shall collect appropriate waste characterization samples and conduct laboratory analysis in accordance with the targeted disposal facility requirements.
- A waste disposal approval package containing appropriate laboratory data, disposal facility acceptance letter(s), and generator waste profiles shall be submitted to the targeted disposal facility for review.
- Upon receipt of disposal facility approval of the sample material, the project team shall receive the approval letter, prior to transfer of waste offsite.
- Waste disposal without an approved disposal facility acceptance letter is not allowed on this Project.

2.7 Disposal Facilities

Soil and materials identified as grossly impacted, either through visual inspection, instrument-based screening, and/or analytical results shall be transported off-site for disposal at the facilities identified below. Such soils shall be transported and disposed of in accordance with the disposal facility's soil acceptance requirements and all federal, state, and local laws and regulations. In addition, the Generator listed on the Manifest or Bill of Lading shall be listed as the Hunts Point Corporative Market. Copies of Manifests and/or Bills of Lading shall be maintained by NYCO. Potential disposal facilities targeted for off-site soil disposal have been outlined below:

Facility Name	Facility Location	Material Accepted by Facility
(1) Clean Earth of Carteret, Inc. (CEC)	24 Middlesex Avenue Carteret, NJ 07008 Phone:9 73-344-4004	Non-Hazardous Contaminated Soil
(2) Clean Earth of Southeast Pennsylvania (Morrisville)	**7 Steel Road** **Morrisville, PA 19067** **Phone: 877-445-3478**	**Heavy end contaminated (MGP-impacted) Soils**
(3) Clean Earth of North Jersey (CENJ)	115 Jacobus Avenue Kearny, NJ 07032 Phone: 724-933-4100	Hazardous Soil
(4) Dale Transfer Corp. (Dale)	129 Dale Street West Babylon, NY 11704 Phone: 516-351-1879	Liquid and solid waste; drummed wastes.

BOLD – Targeted disposal facility for the FHRP.

Additional facilities may be added to this list following review and approvals by the NYCO and the Project team. Prior to waste disposal approval, NYCO shall provide copies the disposal facilities' permits to accept the material, and copies of waste haulers permits to transport the material. Documentation of approved disposal facilities, and their associated permits shall be maintained by NYCO on behalf of HPCM.

As the Morrisville disposal facility has been targeted for the FHRP, copies of the facilities acceptance criteria, and permits have been included in **Appendix 4**. If additional facilities are to be added, their criteria and permits shall be amended to this plan, and distributed to the Project Team.

2.8 Materials Load Out

Soil transportation vehicles shall be manifested and placarded in accordance with all federal, state, and local laws and regulations. Verification that haulers are licensed in accordance with local, state, and federal regulations including 6 NYCRR Part 364 shall be part of the approval process. Vehicles and egress points from the construction area shall be inspected regularly for dirt and other

materials derived from the construction site by the contractor. If required, the vehicles shall be decontaminated prior to leaving the site via truck wash or a similar methodology.

Generated decontamination waters shall be collected and placed within the dewatering holding tanks for treatment. Surface areas shall be cleaned regularly and as required to prevent impacted materials from being unintentionally transported off-site.

2.9 Erosion and Sediment Control Plan

During Site excavation and construction activities, it is expected that soil erosion and sediment control measures may be required to protect sensitive receptors such as storm drains. The contractor shall be responsible for implementing and maintaining erosion and sediment control measures if changing conditions, construction plans, or ineffectiveness of existing measures is determined. Site inspections shall be completed by NYCO's qualified personnel and compared for general compliance with the NYSDEC New York State Standards and Specifications for Erosion and Sediment Control, also known as the "Blue Book."

Contractors and their subcontractors shall be responsible for the compliance with all sediment control practices contained in the contract documents and plans. Soil erosion and sediment control practices are to be installed prior to any major soil disturbances and maintained until permanent protection is established.

3.0 EXCAVATION MONITORING

Site excavation activities are expected to be completed throughout the Project. In December of 2017, the site was entered into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Agreement (BCA) and issued Site No. C203099. NYSDEC BCA related investigation and actions are being managed by the NYCEDC, and are separate from the excavation anticipated with this Project. However, due to the BCA and the recognition of the HPCM as a brownfields site, there are now environmental protocols required for work involving ground penetrating activities.

Contaminated material identified at HPCM is anticipated to exist throughout portions of the Project. Handling of impacted soils during the excavation activities shall be in accordance with procedures outlined in Section 2.0 of this EWP. Protocols for monitoring of the work space during ground intrusive work shall be completed in accordance with this section.

3.1 Community Air Monitoring Plan (CAMP)

During ground intrusive activities completed as part of the FHRP, real-time air monitoring for volatile organic compounds (VOCs) and particulate levels shall be completed locally at excavations. Ground intrusive work includes, but is not limited to, soil/waste excavation and handling, and test pit excavation or trenching. Continuous monitoring shall be performed during active work associated potentially contaminated or contaminated materials, with periodic discrete monitoring for VOCs being performed.

NYCO shall maintain daily reports of the CAMP monitoring in accordance with the protocols outlined below, with exceedances of action levels observed reported to the Project Team.

3.1.1 VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate.

The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the action levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring. Additionally, a discrete reading of VOCs shall be taken at the time of the exceedance located at the downwind boundary of the property, and included in the daily report

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

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

All 15-minute readings, and discrete readings shall be recorded and be available for the Project personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

3.1.2 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the downwind perimeters of the exclusion zone at a temporary particulate monitoring station. The particulate monitoring will 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 will be monitored by a

NYCO technician for indications of a exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the action levels specified below.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will 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.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

All 15-minute readings shall be recorded and be available for the Project personnel to review.

3.2 CAMP Reporting

Daily logs of VOC and particulate monitoring shall be maintained by NYCO for the duration of ground intrusive activities, with exceedances of action levels reported directly to the Project Team. Upon completion of the ground intrusive activities associated with the FHRP, CAMP logs shall be compiled into a single document and distributed to the Project Team for their records.

4.0 HEALTH AND SAFETY PLAN (HASP) SUMMARY

4.1 Site Specific HASP Summary

NYCO's site specific HASP is included in **Appendix 1**. The Site Safety Coordinator will be Sam McTavey, and the onsite representative will be Chris LaFonte. Investigative work performed under this Work Plan will be in compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the investigation work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations.

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

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign a HASP acknowledgment. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the site location before any work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form. Potential on-site chemicals of concern include VOCs, SVOCs, Heavy Metals (specifically arsenic, lead, and mercury at a minimum), and MGP Wastes (i.e. coal tar, purifier waste, ammonia cyanide, sulfur). Information fact sheets for each contaminant group and/or SDS are included in the HASP.

An emergency contact sheet with names and phone numbers for all pertinent project personnel as well as regulatory hotline information is included in the HASP. That document will define the specific project contacts for use in case of emergency.

Figure 1

Site Location Map

Figure 1

General Site Location
Hunts Point Cooperative Market
355 Food Center Drive
Bronx, New York 10474

Environmental Work Plan
November 2018

NYCO Environmental &
Dewatering Corp.

Appendix 1

Site Specific Health and Safety Plan

NYCO Environmental & Dewatering Corp.

Site Specific Health and Safety Plan

Job Site:

Fire Hydrant Replacement Project at Hunts Point Cooperative Market

Environmental Monitoring

October 2018

APPROVALS

By signature, the personnel identified below hereby acknowledge that the following employees of NYCO Environmental and Dewatering Corp. (NYCO) located at 200 Blydenburg Road, Suite 19, Islandia, NY 11749 have reviewed this Site Specific Health and Safely Plan (HASP) and agree to comply with the requirements contained therein as well as the applicable provisions of 29 CFR Parts 1910 and 1926. The undersigned also acknowledge and accept that this HASP is the project HASP for the site work described in the scope of work described within. Furthermore, in reviewing and accepting this HASP, as currently written, the undersigned agree that to the best of their knowledge, this HASP adequately identifies the activities and hazards associated with work at this site and describes the appropriate and necessary precautions and protections for site workers required by the applicable OSHA statutes and regulations.

Sign_____ _____
NYCO Project Manager *(Matt Durcan)* Date

Sign_____ _____
NYCO Site Safety and Health Officer (Sam McTavey) Date

Sign_____ _____
NYCO Site Supervisor (*Chris LaFonte*) Date

The following acronyms are abbreviations for identification purposes of this project, as stated throughout this document;

- HASP- Health and Safety Plan (Site Specific)
- NYCO- NYCO Environmental & Dewatering Corporation
- HPCMI- Hunts Point Cooperative Market, Inc
- HPCM- Hunts Point Cooperative Market
- BCP- Brownfield Cleanup Program {NYCDEC}
- MGP- Manufacturing Gas Plant
- FHRP- Fire Hydrant Replacement Project
- NYCEDC- NYC Economic Development Corporation
- SDS- Safety Data Sheets
- TBD-To Be Determined

1.0 ORGANIZATIONAL STRUCTURE

(in compliance with 29 CFR 1910.120(b)(1) and (b)(2))

This chapter of the Health and Safety Plan (HASP) describes lines of authority, responsibility, and communication for health and safety functions at this site. The purpose of this chapter is to identify the personnel involved in the development and implementation of the site health and safety plan and to describe their roles and responsibilities. This chapter also identifies other contractors and subcontractors involved in work operations and establishes the lines of communication among them for safety and health matters.

The organizational structure of this site's safety and health program is consistent with OSHA requirements in 29 CFR 1910.120(b)(2) and provides the following site-specific information:

* the general supervisor who has the responsibility and authority to direct all hazardous waste cleanup operations
* the site safety and health officer who has the responsibility and authority to develop and implement this HASP and verify compliance
* other personnel needed for cleanup operations and emergency response and their general functions and responsibilities
* the lines of authority, responsibility, and communication for safety and health functions

This chapter is reviewed and updated as necessary to reflect the current organizational structure at this site.

1.1 Roles and Responsibilities

All personnel and visitors on this site must comply with the requirements of this HASP. The specific responsibilities and authority of management, safety and health, and other personnel on this site are detailed in the following paragraphs.

Project Manager (PM)

The Project Manager (PM) for this site is ***Matt Durcan, Senior Project Manager***

matt@nycoenv.com Cell: 631-630-6700

The PM has responsibility and authority to direct all work operations. The PM coordinates safety and health functions with the Site Safety and Health Officer (SSHO), has the authority to oversee and monitor the performance of the SSHO, and bears ultimate responsibility for the proper implementation of this HASP. The specific duties of the PM are:

Preparing and coordinating the site work plan; providing site supervisor(s) with work assignments and overseeing their performance; coordinating safety and health efforts with the SSHO; ensuring effective emergency response through coordination with the Emergency Response Coordinator (ERC); serving as primary site liaison with public agencies and officials and site contractors.
The qualified *alternate* Project Manager (PM) for this site is ***Sam McTavey Cell 914-643-1057***

Site Safety and Health Officer (SSHO)

The Site Safety and Health Officer (SSHO) for this site is ***Sam McTavey Senior Project Manager***

sam@nycoenv.com Cell 914-643-1057

The SSHO has full responsibility and authority to implement this HASP and to verify compliance The SSHO reports to the Project Manager. The SSHO is on site or readily accessible to the site during all work operations and has the authority to halt site work if unsafe conditions are detected. The specific responsibilities of the SSHO are:

Managing the safety and health functions on this site; serving as the site's point of contact for safety and health matters; ensuring site monitoring, worker training and effective selection and use of PPE; assessing site conditions for unsafe acts and conditions and providing corrective action; assisting the preparation and review of this HASP; maintaining effective safety and health records as described in this HASP; coordinating with the Emergency Response Coordinator (ERC), Site Supervisor(s), and others as necessary for safety and health efforts.

The qualified alternate SSHO for this site is ***Chris LaFonte Cell: 203-788-3169***

Emergency Response Coordinator (ERC)

The Emergency Response Coordinator (ERC) for this site is ***Chris LaFonte Cell: 203-788-3169***

The ERC is responsible for assessing site conditions and directing and controlling emergency response activities and personnel in accordance with the Site Emergency Response Plan. The ERC reports to the Project Manager (PM). The ERC will ensure the evacuation, emergency transport, and treatment of site personnel and will notify the appropriate emergency response units and management staff in accordance with the emergency response plan of this HASP. Specific duties of the ERC include:

Developing and reviewing the emergency response plan; conducting emergency response rehearsals; ensuring effective emergency response to and evacuation of the site; coordinating emergency response functions with the Site Safety and Health Officer (SSHO), and integrating site emergency response plans with the disaster, fire, and/or emergency response plans of local, state, and federal organizations and agencies.

The qualified alternate Emergency Response Coordinator (ERC) for this site is ***(Sam McTavey Cell 914-643-1057)***

Site Supervisor

The Site Supervisor for this site is ***Chris LaFonte Cell: 203-788-3169***

The Site Supervisor is responsible for field operations and reports to the Project Manager (PM). The Site Supervisor ensures the implementation of the HASP requirements and procedures in the field. The specific responsibilities of the Site Supervisor are:

Executing the work plan and schedule as detailed by the PM; coordination with the Site Safety and Health Officer (SSHO) on safety and health; ensuring site work compliance with the requirements of this HASP. The Site Supervisor has also been identified as the ***Competent Person*** for this Job. Training Certificates and qualifications are filed at the offices of NYCO and are available upon request for the Competent Person.

Site Workers

Site workers are responsible for complying with this HASP, using the proper PPE, reporting unsafe acts and conditions, and following the lines of authority established for this project site. Training Certificates for Site Workers are filed at the offices of NYCO and are available upon request.

1.2 Identification of Other Site Contractors

There are no other contractors or subcontractors on this site.

2.0 SITE CHARACTERIZATION AND JOB HAZARD ANALYSIS

(in compliance with 29 CFR 1910.120(b)(4)(ii)(A), 1910.120(c) and 1910.120(i))

This section of the HASP identifies and describes safety and health hazards associated with site work. The purpose of characterization and job hazard analysis is to identify and quantify the health and safety hazards associated with each site task and operation, and to evaluate the risks to workers. With this information, risks are then eliminated if possible, or effectively controlled. The information contained in this section of the HASP is essential to effective preparation of all other sections of the HASP. This section of the HASP includes:

* scope of work
* job hazard analysis
* chemical and biological hazard information
* employee notification of hazards

The SSHO is responsible for ongoing site characterization and job hazard analysis at this site.

2.1 Scope of Work

NYCO will be onsite to oversee and monitor excavation and soil handling procedures on behalf of Hunts Point Cooperative Market, Inc. during the Fire Hydrant Replacement Project (FHRP) at Hunts Point Cooperative Market (HPCM).

The FHRP includes the excavation, removal, and replacement of 26 Fire Hydrants located around the HPCM. In December of 2017, the site was entered into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Agreement (BCA) and issued Site No. C203099. NYSDEC BCA related investigation and actions are being managed by the NYCEDC, and are separate from the excavation anticipated with the FHRP. However, due to the BCA and the recognition of the HPCM as a brownfields site, there are now environmental protocols required for work involving ground penetrating activities. Portions of the FHRP may encounter remnants of Manufacturing Gas Plant (MGP) contamination, which historically occupied portions of the Hunts Point Peninsula. HPCM Site is currently enrolled in the NYCDEC Brownfield Cleanup Program (BCP), as the property lies a portion of the Hunts Point Peninsula, Bronx NY; that formally contained a Manufacturing Gas Plant (MGP). Portions of the Fire Hydrant Replacement Project may encounter remnants of MGP processing, which historically impacted location from previous operations.

NYCO contracted by HPCMI; shall report any environmental issues to HPCMI and NYCEDC.

NYCOs scope of work includes the following:

<u>Materials Management (Planning and Oversight)</u>

- Excavation and stockpiling of excavated soil

- Erosions and sediment control measures
- Covering of stockpiled soil to protect it from the elements including wind and rain to prevent airborne contamination and potential runoff of contaminated waters or soil.
- Quarantine of any suspected or impacted soils

Excavation Monitoring (Oversite)

- Daily on-site air monitoring during the soil excavation and stockpiling
- Daily on-site inspections of excavated soils to determine if the presence of contaminants.
- Daily reporting and logging requirements.

Environmental Sampling

- Hand grabs from stockpiles wearing nitrile gloves and level D PPE
- Soil sampling of suspect soils
- Samples shall be tested by a New York State ELAP qualified laboratory
- Material Transport and Disposal (Planning and Oversite)
- Process plan for the appropriate disposal of contaminated soil in accordance with rules and regulations outlined in 6 NYCRR Part 360, when required.
- Outline of project communications related to soil removal or the reuse and implementation of institutional controls; when approved by NYCEDC and their consultant.

2.2 Job Hazard Analysis

Appendix A contains the job hazard analysis (JHAs) information for this site and the planned hazard controls. The JHAs lists each task or operation required for this facility cleanup project, by task. Biological and chemical hazards and their known or anticipated airborne concentrations are identified for each distinct combination of location and task/operation. Based on the task/operation, anticipated physical hazards are also identified. Then, based on the best available knowledge of how that task/operation will be performed, the likelihood of exposure to the hazards identified for the task/operation at that location is indicated. The JHAs also list the control measures implemented to protect employees from the hazards identified. The information provided here is designed to satisfy the job hazard analysis requirements of 1910.120(b)(4)(ii)(A) and the workplace hazard assessment requirements of 1910.132(d).

The JHAs are modified by the SSHO when:

* the Scope of Work is changed by adding, eliminating, or modifying tasks
* new methods of performing site tasks are selected
* observation of the performance of site tasks results in a revised characterization of the hazards
* new chemical, biological, or physical hazards are identified
* exposure data indicate changes in the concentration and/or likelihood of exposure
* new/different control measures are selected

2.3 Employee Notification of Hazards and Overall Site Information Program

NYCO will also inform other contractors and subcontractors about the nature and level of hazardous substances at this site, and likely degree of exposure to workers who participate in site operations. The SSHO is responsible for providing site characterization information, this HASP, and modifications to it to other contractors and subcontractors working on this site.

3.0 EMERGENCY RESPONSE PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly, and require an immediate response; therefore, contingency planning and advanced training of staff is essential. Specific elements of emergency support procedures that are addressed in the following subsections include communications, local emergency support units, preparation for medical emergencies, first aid for injuries incurred on site, record keeping, and emergency site evacuation procedures.

3.1 Communications

Once an emergency situation has been stabilized or as soon as practically possible, the SSHO will contact the Project Manager and HPCMI representative of an identified emergency situation. In case of an emergency 911 should be contacted first.

Project Manager: ***Matt Durcan, Senior Project Manager Cell: 631-630-6700***
ALT: (Sam McTavey Cell 914-643-1057)

Hunts Point Cooperative Market Construction Representatives:

Program Director TBD
Name:
Office:
Cell Phone:
Email:

If appropriate, 911 should also be contacted.

3.2 Local Emergency Support Units

In order to be able to deal with any emergency that might occur during investigative activities at the site, a specific route to the nearest hospital will be discussed at each morning's tool box meeting. This information will be available to all personnel conducting work within the site. Outsite emergency number 911 and local ambulance should be relied on for response to medical emergencies and transport to emergency rooms. The SSHO will determine the appropriate route based on time of day and traffic patterns. Changes in the referenced primary facilities shall be documented with the HASP.

The Emergency Phone Numbers listed are preliminary. Upon mobilization, the SSHO shall verify all numbers and document the changes in the HASP.

3.3 Pre-Emergency Planning

NYCO will communicate directly with administrative personnel from the emergency room at the hospital in order to determine whether the hospital has the facilities and personnel needed to treat cases of trauma

resulting from any of the contaminants expected to be found on the site. Instructions for finding the hospital will be posted conspicuously in the site office and in each site vehicle.

3.4 Emergency Medical Treatment

The procedures and rules in this HASP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it will be reported to the SSHO onsite immediately. First-aid equipment will be available on site at the following locations:

First Aid Kit: Vehicles

Emergency Eye Wash: Vehicles

During the site safety briefing, project personnel will be informed of the location of the first aid station(s) that has been set up. Unless they are in immediate danger, severely injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics, before an emergency-response squad arrives at the site or before the injured person can be transported to the hospital, will be followed closely.

Personnel with current first aid and CPR certification will be identified. Only in non-emergency situations will an injured person be transported to the hospital by means other than an ambulance.

Nearest hospital: Lincoln Medical Center: Emergency Room
234 Eugenio Maria De Hostos Blvd (East 149th Street)
Bronx, New York 10451
(Between Park and Morris Avenues)
718-579-5000
(directions from site to hospital found In Appendix C)

3.5 Emergency Site Evacuation Routes and Procedures

All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs as a result of the site investigation activities, including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, the Project Manager will be verbally notified immediately. All heavy equipment will be shut down and all personnel will evacuate the work areas and assemble at the nearest intersection to be accounted for and to receive further instructions.

3.6 Fire Prevention and Protection

In the event of a fire or explosion, procedures will include immediately evacuating the site and notification of the Project Manager of the investigation activities. Portable fully charged fire extinguishers will be provided at the site. The extinguishers located in the various locations should also be identified prior to the

start of work. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

3.6.1 Fire Prevention

Fires will be prevented by adhering to the following precautions:

- Good housekeeping and storage of materials.
- Storage of flammable liquids and gases away from oxidizers.
- Shutting off engines to refuel.
- Grounding and bonding metal containers during transfer of flammable liquids.
- Use of UL approved flammable storage cans.
- Fully charged fire extinguishers rated at least 10 pounds ABC located on all heavy equipment, in all trailers and near all hot work activities.

The person responsible for the control of fuel source hazards and the maintenance of fire prevention and/or control equipment is the SSHO.

3.7 Vapor Release

NYCO will be conducting the environmental oversight and monitoring of construction activities associated with replacement of a Fire hydrant system in Hunts Point, Bronx. NYCO shall implement specific attention to reflect potential likelihood of environmental and hazardous exposures. Identified environmental hazards know so far include;

- Non-Hazardous and potentially characteristically soil from Manufactured Gas Plant (MGP) historical activities
- Coal Tar
- Purifier Waste
- Historical Fill

Known hazards include the site historically operating as a former MGP and the hazards associated with that, ammonia, cyanide, sulfur and heavy metals, particularly arsenic. Based on the proposed tasks, the potential for a significant vapor release is low. If a release occurs, the following steps will be taken:

- Move all personnel to an upwind location. All non-essential personnel shall evacuate.
- Downwind perimeter locations shall be monitored for oxygen.
- If the release poses a potential threat to human health or the environment in the community, the Emergency Coordinator shall notify the Project Manager.
- Local emergency response coordinators will be notified.

3.8 Overt Chemical Exposure

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the Safety Data Sheet (SDS) will be followed, when necessary.

SKIN AND EYE: Use copious amounts of soap and water from eye-wash kits and portable hand wash stations.

CONTACT: Wash/rinse affected areas thoroughly, then provide appropriate medical attention. Skin shall also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs. Affected items of clothing shall also be removed from contact with skin. Providing wash water and soap will be the responsibility of each individual contractor or sub-contractor on-site.
INHALATION: Move the effected person to fresh air. Seek medical attention.

4.0 TRAINING PROGRAM

(in compliance with 29 CFR 1910.120 (b)(4)(ii)(B), 29 CFR 1910.120(e) and 29 CFR 1910.120 (q)(11))

The site training program is designed to ensure that workers receive the training they need to work safely. Site safety and health training requirements are based on the job hazard assessments contained in Chapter 2 of this HASP and relevant OSHA requirements.

At this site, the SSHO oversees the implementation of this training program and is responsible for ensuring that employees are adequately and currently trained for all tasks they are asked to perform. Employees who have not been trained to a level required by their job function and responsibility are not permitted to participate in or supervise field activities.

This training program is consistent with the requirements of 29 CFR 1910.120(e) and (q)(11) and addresses the following site-specific information:

- initial training for site workers & supervisors
- exceptions to initial training requirements
- site briefings for visitors and workers
- refresher training
- qualification of trainers
- training certification
- emergency response training

4.1 Initial Training for Site Workers and Supervisors

Initial training requirements are based on the designation of the site as either post-emergency response operations or as a government identified uncontrolled hazardous waste site, a worker's potential for exposure, and compliance with the applicable regulatory requirements of 29 CFR 1910.120 (q)(11) and/or (e)(3).

Personnel at this site have successfully completed 40-hour initial HAZWOPER training consistent with the requirements of 29 CFR 1910.120(e)(3)(i), or have received equivalent training consistent with the provisions of 29 CFR 1910.120(e)(9), in order to work in contaminated areas. In addition, such personnel have received 3 days of supervised field experience applicable to this site.

The initial training provided to these workers addresses:

- names of personnel and alternates responsible for site safety and health
- safety, health and other hazards present on the site
- use of PPE
- work practices by which the employee can minimize risks from hazards
- safe use of engineering controls and equipment on the site
- the spill containment program detailed in Chapter 10 of this HASP
- decontamination procedures detailed in Chapter 11 of this HASP

OSHA 10hr Construction Industry Safety Training

All workers on this HPCMI project will have a card on site certifying that they have completed the OSHA 10hr Construction Safety training within the past 5 years as required by the HPCMI. *Employee 10hr Cards are provided in Attachment E.*

4.3 Site-Specific Briefings for Visitors and Workers

A site-specific briefing is provided to all individuals, including site visitors, who enter the site beyond the initial point of access. For visitors, the site-specific briefing provides information about site hazards, the site lay-out including work zones and places of refuge, the emergency alarm system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

4.4 Refresher Training

All workers on this site, including managers and supervisors, receive annual HAZWOPER refresher training consistent with the requirements of 29 CFR 1910.120

4.5 Qualification of Trainers

Only instructors qualified in accordance with 29 CFR 1910.120 (e)(5) are used to train workers for this site. Qualified instructors have either completed a training program for the subjects they are expected to teach, or have the academic credentials and instructional experience necessary for teaching these subjects.

4.6 Training Certification

This site maintains written certification of the successful completion of applicable training requirements for all personnel. Employees and supervisors receive a written certificate when they complete necessary training and field experience. Any person who has not been so certified or who does not meet the requirements of equivalent training is prohibited from engaging in the clean-up operations on this site.

5.0 PERSONAL PROTECTION EQUIPMENT

5.1 Purpose

This program is designed to fulfill the requirements as stated in CFR Title 29 Part 1910.120(g)(5) Personal Protective Equipment Program, administered by the Occupational Safety and Health Administration (OSHA).

5.2 Scope

This program covers the use and selection of all elements of personal protective equipment other than respiratory protection. It covers the other remaining elements of Personal Protective Equipment, including Chemical Protective Clothing (CPC), whenever the employees of NYCO use such equipment.

A health hazard assessment is required to establish the necessity for wearing PPE; this has been completed and addressed in the JHAs. If it is determined that a need for PPE exists, the type of PPE used will be based upon the hazards present in the work place.

5.3 Administration and General Information

This program covers the use of any Personal Protective Equipment to protect the wearer from bodily contact with physical, biological, and chemical hazards present in the work place. Standard PPE for this project will be as follows; however if the JSA requires additional PPE then it must be worn by the effected employees:

- Hard Hats
- Eye protection
- Protective clothing, including gloves and garments designed to protect from chemical exposure
- Steel Tip Boots

This program is based upon the following government regulations and industry standards:

- CFR Title 29 Part 1910 Subpart I — Personal Protective Equipment
- CFR Title 29 Part 1910.132 — General Requirements
- CFR Title 29 Part 1910.133 — Eye and Face Protection
- CFR Title 29 Part 1910.135 — Occupational Head Protection
- CFR Title 29 Part 1910.136 — Occupational Foot Protection
- CFR Title 29 Part 1910.120(g)(5) — Personal Protective Equipment Program
- CFR Title 29 Part 1910 Appendix B — General Description and Discussion of the Levels of Protection and Protective Gear
- CFR Title 41 Part 50-204.7
- ANSI Z-87.1, — American National Standards Institute (ANSI)
- ANSI Z-89.1, — ANSI

- ANSI Z-41.1, ANSI
- CFR Title 29 Part 1000, Permissible Exposure Levels, OSHA
- American Conference of Governmental Industrial Hygienists, Threshold Limit Value (TLV) exposure limits
- National Institute of Safety and Health (NIOSH) Recommended Exposure Limits (REL).

Chemical Protective Clothing and other splash protection will be worn whenever the potential for exposure by physical contact with hazardous materials in solid, liquid, or gaseous forms has been identified. Other forms of PPE such as head, foot and eye protection will be utilized to reduce exposures to physical hazards such as falling objects, particles and splashes.

It will be the policy of the company to utilize appropriate engineering controls whenever available to reduce the potential for exposure to hazards present in the work place which would require the use of PPE. PPE will be used in addition to, or in place of, such engineering controls whenever reduction of hazards to safe levels cannot be accomplished.

Within NYCO, this program will be administered by the Company Safety Officer, and the designated Safety Coordinators, who, together, will be responsible for the generation and execution of all portions of the program, and who will have the necessary authority to assure that all requirements of this program are properly fulfilled.

5.4 Selection of Personal Protective Equipment

A hazard assessment of the particular work and job site will be used to determine if hazards are present or are likely to be present, and to determine the appropriate PPE. The selection is to be based on hazards that each employee is likely to be exposed. Employees will be evaluated as individuals and the appropriate PPE selected accordingly.

NYCO is employed as the environmental consultant responsible for oversight at a facility known or suspected to contain health hazards which may require the use of Personal Protective Equipment, the Project Manager, in conjunction with the Company Safety Officer, will have the responsibility to determine the hazards present through application of an appropriate air sampling program and work place analysis. Based upon those results, and the guidelines to be set forth in the PPE Selection Program developed by the Corporate Health and Safety Director and the Safety Coordinator will be responsible to select and furnish Personal Protective Equipment to company employees exposed to such physical and health hazards. The Company Safety Officer will also be responsible for ensuring that subcontractors are notified of site conditions that warrant use of PPE, in order for them to properly equip themselves to perform work on site.

Personal Protective Equipment appropriate for the work place will be selected based upon a comparison of the knowledge available about the hazards present to the established limitations for such systems as published in technical literature and reference sources such as:

- Chemical Protective Clothing, Volume 2: Product and Performance Information, American

Industrial Hygiene Association (AIHA).
- NIOSH Pocket Guide to Chemical Hazards, DHHS (NIOSH) Publication Number 90-117.
- Permeation Data from Clothing and Fabric Manufacturers.

Should hazards be found which would preclude the use of the Personal Protective Equipment available at the work site, or should employees or subcontractors not be trained, fitted or medically approved to use the protection required for the work site, employees will not be permitted to enter the work site.

5.5 Personal Protective Equipment

The "Chemical Protective Clothing Selection Worksheet", included in this program, may be used to assist in the determination of the proper PPE to be utilized for the specific hazards present at the work site. NYCO has selected Personal Protective Equipment that should be used by its employees, based upon the typical hazard encountered at their work sites.

This equipment includes:

- Hardhat conforming to ANSI Z89.I 1986 Class B.
- Chemical resistant gloves manufactured from Nitrile.
- Natural rubber over-boots and latex disposable boot covers.
- Appropriate foot protection manufactured from leather,
- Safety glasses and goggles conforming to ANSI Z 87.1
- Nitrile inner sampling gloves
- Leather work gloves

Selection of Personal Protective Equipment will be based on its protective properties related to the specific conditions of the environment in which it will be used and the requirement to properly fit the employee. The Company Safety Officer will be responsible for maintaining an adequate inventory of PPE and providing it as necessary to NYCO personnel.

NYCO employees are permitted to provide his or her own PPE provided that the PPE meets or exceeds the standard of protection required in the health hazard assessment. The Company Safety Officer will verify that employee provided PPE is adequate. Employees are required to maintain his or her provided PPE as they would company provided PPE.

5.6 Employee Training

All employees who are required to use Personal Protective Equipment will successfully complete a Personal Protective Equipment Training Program that will include, but not be limited to the following topics, which are addressed in the 40-Hour HAZWOPER Training Course and 8-Hour Annual Refresher Course:

- The contents of 29 CFR 1910.120 (g)(5).
- The contents of this PERSONAL PROTECTIVE EQUIPMENT PROGRAM.
- Hazards potentially present at work sites and their relationship to the type of PPE to be used,

stressing that the selection of PPE is based upon the hazards present.

- Various types of PPE available and their use and limitations. Explanation of degradation, penetration, and permeation as routes of chemical entry into protective clothing.
- Work mission duration and its effect upon the selection of PPE.
- Inspection procedures prior to and during use.
- Proper cleaning, decontamination, disposal, and/or post-use inspection.
- Care, maintenance and storage.
- Proper fitting, adjusting, and donning and doffing procedures.
- Limitations during temperature extremes, including facts and symptoms of heat and cold induced medical emergencies.

Employee will be retrained on PPE when: the workplace changes making the previous training obsolete; the type of PPE changes; or when the employee demonstrates lack of use, improper use, or insufficient skill or understanding.

Employees must demonstrate competency in PPE following the training either through skill demonstration or passing a written test. The certification will include the employee's name, the dates of training, and the certification subject.

The Company Safety Officer will maintain records concerning the training and any special circumstances for all employees subject to this program.

5.7 Maintenance

Personal Protective Equipment is issued to all employees who may be required to use PPE. It will be the responsibility of all employees to properly inspect, clean, store and maintain in good working order all PPE issued to them.

Whenever problems or defects are discovered in any of the issued PPE, the employee will inform the Company Safety Officer of the discrepancy, and the defective PPE will be exchanged for PPE in proper working order. Defective or damaged PPE will not be used under any circumstances.

The Company Safety Officer will maintain an adequate stock of PPE and cleaning supplies. Additionally, the Director will insure that such supplies are available to employees, and will conduct inspections of all PPE to ascertain that it is being properly stored, maintained, and cleaned, correctly used, and conscientiously worn.

5.8 Program Evaluation

The Company Safety Officer will review all aspects of this Personal Protective Program whenever needed, and at least annually, to assure its effectiveness. Whenever modifications in PPE needs are required through changes in work scope, equipment changes or modification, revision of federal regulations or standards, or any action that would necessitate a change in any of the contents of this Personal Protective Equipment Program, such changes will be made, and everyone affected by those changes notified and retrained, if necessary. All such modifications will be made in writing, and the nature of the modification

noted and dated.

6.0 EXPOSURE MONITORING PROGRAM

(in compliance with 29 CFR 1910.120(b)(4)(ii)(E) and 29 CFR 1910.120(h))

This chapter of the HASP describes how levels of potentially hazardous substances and physical hazards, and worker exposures to them, are monitored at this site. This exposure monitoring program provides project-specific information about:

* monitoring procedures to detect the presence of potentially hazardous substances
* monitoring procedures to determine worker exposures to potentially hazardous substances and physical hazards
* action levels and required responses for known and expected potentially hazardous substances and physical hazards
* calibration and maintenance procedures for monitoring equipment

The SSHO is responsible for implementing this exposure monitoring program.

6.1 Air Monitoring / Community Air Monitoring Program (CAMP)

NYCO will be onsite to oversee and monitor excavation and soil handling procedures on behalf of HPCM during the FHRP. The FHRP includes the excavation, removal, and replacement of 26 Fire Hydrants located around the HPCM. HPCM Site is currently enrolled in the NYCDEC Brownfield Cleanup Program (BCP), as the property lies a portion of the Hunts Point Peninsula, Bronx NY; that formally contained a Manufacturing Gas Plant (MGP). Portions of the FHRP may encounter remnants of MGP processing, which historically impacted location from previous operations.

Therefore NYCO will perform Excavation Monitoring (Oversight) which consists of the following:

- Daily on-site air monitoring during the soil excavation and stockpiling (CAMP)
- Daily on-site inspections of excavated soils to determine if the presence of contaminants.
- Daily reporting and logging requirements.

6.1.1 Continual Monitoring

Continual monitoring is conducted to evaluate potential worker exposure to airborne hazardous substances and surface contamination. Resulting data are then used to determine baseline and on-going airborne and surface concentrations of contaminants, particularly when employee exposures may change significantly or rapidly. Situations in which conditions and employee exposures may change significantly or rapidly include:

* commencement of work on another portion of the facility
* exposure to or handling of contaminants/hazards not previously identified
* commencement of a new task/operation
* change in environmental conditions
* commencement of task/operation that is likely to increase airborne concentrations of potentially hazardous substances

Continual air monitoring shall be completed in accordance with NYCO's Environmental Work Plan (EWP).

As the site is a former MGP, NYCO will be monitoring excavations with PID and Dust track meter. A Community Air Monitoring Program (CAMP) will be implemented by NYCO to monitor for Dust and Volatile Organic Compounds (VOC). NYCO will additionally have hand held PID meters and Dust Tracks.

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for total organic vapors 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 remedial construction work activities and monitoring 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 do not spread contamination off-site through the air.

6.2 Action Levels

Action levels for the CAMP site with PID and dust monitoring has been identified 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 will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will 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 will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will 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 will be shutdown.

4. All 15-minute readings will be recorded and be available for the project team personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate concentrations will be monitored continuously at the downwind perimeters of the immediate work area at a particulate monitoring station. Upwind particulate concentrations shall be checked daily to establish a baseline. The particulate monitoring will 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 will be monitored by a NYCO Technician for indications of a possible exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

PARAMETER	RANGE	ACTION REQUIRED
Total Organic Vapors	0 ppm to <1 ppm above background at perimeter	Normal operations will continue with breathing zone monitoring.
	>5 ppm peak above background at perimeter	Work activities will be halted and monitoring will be continued. If instantaneous readings steadily decrease, work may resume.
	>25 ppm above background in work area	Work activates will be halted and the source of vapors will be identified. Corrective actions will be taken to abate emissions and monitoring will be continued.
Particulates	<150 µg/m^3 at downwind perimeter	Normal operations.
	>150 µg/m^3 average sustained for more than 15 minutes at downwind perimeter	Collect upwind perimeter reading for comparison with downwind reading.
	>100 µg/m^3 above upwind background, or visible dust migrating from disturbance area beyond perimeter	Employ dust suppression techniques.
	Dust suppression cannot control downwind levels to <100 µg/L compared with Upwind	Work activities will be halted and corrective actions taken.

6.3 Meteorological Monitoring

Meteorological data will be logged at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The meteorological data to be monitored consists of wind speed, wind direction, temperature, barometric pressure, and relative humidity. Wind direction measurements will be utilized to position the total organic vapor and particulate monitoring equipment in appropriate upwind and downwind locations.

6.4 Available Suppression Techniques

A potable water (mist) or vapor suppression foam will be applied to areas where the generation of total

organic vapors and odors, or particulates may be released into the air at unacceptable levels during intrusive activities in order to mitigate potential airborne contaminant releases. Potable water misting via dedicated hose will be utilized as a daily site control measure to mitigate the potential for particulate/dust released into non-contaminated areas and roadways. Excavation methods and material staging and loading methods will be continually evaluated and modified (as necessary) to alleviate the potential for total organic vapors, odor, and particulate releases

6.5 Reporting

All recorded monitoring data will be downloaded and field logged daily, including Action Limit Reports (if any) and daily CAMP monitoring location plans. All records will be maintained by NYCO for the Project Team to review.

7.0 HEAT STRESS PREVENTION PROGRAM

(in compliance with 29 CFR 1910.120(h))

This chapter of the HASP describes how the site-specific environmental conditions (temperature, humidity, air movement), employee work loads, and PPE may expose employees to hazards resulting in injury or illness related to heat stress. This Heat Stress Prevention Program outlines exposure controls to protect employees working in hot environments. The elements of this program are outlined in this section and include the following:

* Program Implementation Criteria
* Heat Stress Management
* Training

The SSHO is responsible for implementing the Heat Stress Prevention Program, monitoring work area heat conditions and worker physiological parameters, and for ensuring that employees are trained to recognize the signs and symptoms of heat stress illnesses or injury and what to do if these occur.

7.1 Program Implementation Criteria

The Heat Stress Prevention Program is implemented when work area temperatures rise above *68.5° F*

OSHA Technical Manual, Section 3, Chapter 4:

OSHA has incorporated much of the American Conference of Governmental Industrial Hygienists ACGIH) Heat Stress strategy into the Technical Manual. This strategy recommends a wet bulb globe temperature (WBGT) of 68.5° F as an acceptable environment for unacclimatized employees to conduct continuous moderate work wearing water barrier ***permeable*** *clothing. This value may be used as the criteria for instituting a heat stress protection program. The WBGT is calculated as follows:*

$$WBGT_{(indoor/outdoor\ \ no\ solar\ load)} = 0.7NWB + 0.3\ GT$$

$$WBGT_{(outdoor\ \ solar\ load)} = 0.7NWB + 0.2GT + 0.1DB$$

Acronyms in the equations refer to the following:

NWB- Natural Wet Bulb Temperature

GT -Globe Temperature

DB-Dry Bulb

7.2 Heat Stress Management

Work practices and exposure controls are used to reduce the risk of elevating an employee's core body temperature. These work practices and exposure controls include the following:

* defining and adjusting employee work/rest intervals
* monitoring for physiological signs of heat stress
* providing cool liquids

Employee Work/Rest Intervals

Work/rest intervals are based on PPE, employee work loads, environmental conditions (temperature, humidity, air movement), and the results of physiological monitoring. Work/rest intervals are determined by the SSHO and communicated to employees. Work/rest intervals are adjusted throughout the work shift as needed and communicated to each employee at the conclusion of an applicable rest period, prior to reentry into the work zone.

Monitoring

Physiological monitoring is conducted to alert employees and their supervisors to potential heat stress illness. Initial monitoring is conducted and documented at the beginning of the work shift, prior to entry into the work zone, by the SSHO.

Physical signs and symptoms of heat stress are discussed with employees every work/rest interval and reviewed repeatedly, as necessary. Employees monitor each other's actions, speech and appearance for signs and symptoms of heat-related illnesses. Employees exhibiting signs or symptoms of heat exhaustion or heat stroke are forced to remove themselves from the work area and/or tank, take a rest interval, hydrate and seek medical attention.

The physician's written opinion specifically addresses fitness for duty for employees who will work at temperatures at or above *68.5° F*. This evaluation is described in Chapter 5, Medical Surveillance.

Liquid Replacement Program

Since dehydration is a primary cause of heat illness, employees on this site follow the regimen for liquid consumption. A liquid replacement regime is not based on thirst. Employees need enough liquid and electrolytes to maintain their normal body weight throughout the day. Some sports drinks may exacerbate problems for some employees with certain medical conditions. Carbonated beverages are not recommended as a primary beverage for replacing body fluid because many contain caffeine and the gas makes them difficult to drink in large quantities.

The OSHA Technical Manual provides the following guidance: Make cool (50° - 60?F) water or any cool liquid (except alcoholic beverages) available to workers to encourage them to drink small amounts frequently, e.g., one cup every 20 minutes. Provide ample supplies of liquids close to the work area. Although some commercial replacement drinks contain salt, this is not necessary for acclimatized individuals because most people add enough salt to their diets.

Acclimatization Program

Acclimatization increases physical tolerance to warm climates by improving the circulatory system and balance of salt in the body. Employees that are newly hired, have not worked in a comparable environment during the previous 30 days, or have been away from this site (vacation or sickness) for the same period of time follow the acclimatization procedures identified in Table 8.

Table 8 Worker Acclimatization Procedures		
Worker Status	**Heat Condition**	**Procedures**
Full-time	Sudden increase in air temperature, humidity, workload, or PPE	50% exposure on day one, 60% on day two, 80% on day three, and 100% on day four
Newly-hired or after extended absence from site or sickness	Warm, with PPE	20% on day one, with a 20% increase in exposure each additional day
Newly-hired or after extended absence from site or sickness	Hot	20% on day one, with a 20% increase in exposure each additional day

7.3 Training:

Employees receive general training regarding heat stress-related injuries and illnesses during initial HAZWOPER training and subsequent refresher training. The site-specific program and procedures are communicated as identified in Chapter 4, Training.

8.0 COLD STRESS

Adverse climate conditions such as cold weather are important considerations in planning and conducting site operations. The largest danger regarding cold stress is hypothermia, which occurs when the body's core temperature drops below 96.8°F. Conditions that could induce such a drop are immersion in low temperature water and exposure to extremely cold ambient temperatures. Work warming regimens will be instituted as necessary as determined by the SSHO. Signs and symptoms of a low body core temperature are shivering, a lower mental alertness, less ability to make rational decisions, and loss of consciousness. When working in cold environments, specific steps should be taken to lessen the chances of cold-related injuries. These include the following:

- Protecting of exposed skin surfaces with appropriate clothing (such as face masks, handwear, and footwear) that insulates, stays dry, and blocks wind
- Shielding the work area with windbreaks to reduce the cooling effects of wind
- Providing equipment for keeping workers' hands warm by including warm air jets and radiant heaters in addition to insulated gloves
- Using adequate insulating clothing to maintain a body core temperature of above 96.8°F
- Providing extra insulating clothing on site

Clinical signs of cold stress are listed in Table 9-1.

Table 9-1. Cold Stress Clinical Signs

Core Temperature	Clinical Signs
98.6°F	Normal Oral Temperature
96.8°F	Metabolic rate increases in an attempt to compensate for heat loss
95.0°F	Maximum shivering
93.2°F	Victim conscious and responsive, with a normal blood pressure
91.4°F	Severe hypothermia below this temperature
89.6-87.8°F	Consciousness clouded; blood pressure becomes difficult to obtain; pupils dilated but react to light
86.0°F – 84.2°F	Progressive loss of consciousness; muscular rigidity increases; pulse and blood pressure difficult to obtain; respiratory rate decreases

8.1 Hypothermia

A potential for hypothermia from exposure to potentially cool air temperatures, windy conditions, and low water temperatures exists. The signs of hypothermia include shivering, numbness, glassy stare, reduction of rational decision-making, apathy, weakness, impaired judgment, or a loss of consciousness. To care for workers that have hypothermia, the following steps should be taken:

- Gently move the person to a warm place.
- Remove any wet clothing from the person and dry the person.

- Warm the person SLOWLY by wrapping them in blankets or by putting dry clothing on the person.
- Hot water bottles and chemical hot packs may be used when the person is first wrapped in a towel or blanket. Focus on warming the trunk or core of the body first (e.g. place warm water bottles under arms.)
- DO NOT WARM PERSON TOO QUICKLY, such as immersing him or her in warm water. Rapid warming can cause dangerous heart rhythms.

9.0 SPILL CONTAINMENT PROGRAM

(in compliance with 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii))

This chapter of the HASP describes the potential for hazardous substance spills at this site and procedures for controlling and containing such spills. The purpose of this chapter of the HASP is to ensure that spill containment planning is conducted and appropriate control measures are established, consistent with OSHA requirements in 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii).

9.1 Results of Evaluation for Potential Spills

The spill containment program addresses the following site-specific information:

* potential hazardous substance spills and available controls
* initial notification and response
* spill evaluation and response
* post-spill evaluation

9.2 Potential Spills and Available Controls

An evaluation was conducted to determine the potential for hazardous substance spills at this site. That evaluation indicates that a hazardous substance spill could potentially occur. Therefore, the following site-specific spill containment program has been implemented to address spill containment planning, equipment, and procedures. Site personnel are trained in the contents of this spill containment program and their roles and responsibilities during spill response operations.

Where spills, leaks, or ruptures can occur, this site has suitable quantities of proper absorbent and US Department of Transportation-specified salvage drums/containers. In addition, all areas subject to potential spills are diked or a means to adequately dike these areas in the event of a spill is available so that the entire volume of the hazardous substance being spilled can be contained and isolated.

9.3 Initial Spill Notification and Response

Any worker who discovers a hazardous substance spill immediately notifies the Project Manager.
The worker reports, to his/her best ability, the hazardous substance involved, the location of the spill, the estimated quantity of substance spilled, the direction/flow of the spill material, related fire/explosion incidents, and any associated injuries

9.4 Spill Evaluation and Response

The Project Manager is responsible for evaluating spills and determining the appropriate response. When this evaluation is being made, the spill area is isolated and demarcated to the extent possible.

When an incidental release occurs, clean-up personnel receive instructions in a pre-clean-up meeting as to spill conditions, PPE, response activities, decontamination, and waste handling.

If necessary to protect those outside the clean-up area, notification of the appropriate authorities is will be made.

All reportable petroleum spills and most hazardous materials spills must be reported to DEC hotline (1-800-457-7362) within New York State; and (1-518 457-7362) from outside New York State. For spills not deemed reportable, it is strongly recommended that the facts concerning the incident be documented by the spiller and a record maintained for one year.

The following are general measures that response/clean-up personnel take when responding to a spill:

* To minimize the potential for a hazardous spill, hazardous substances, control/absorbent media, drums and containers, and other contaminated materials are properly stored and labeled.
* When a spill occurs, only those persons involved in overseeing or performing spill containment operations will be allowed within the designated hazard areas. If necessary, the area will be roped, ribboned or otherwise blocked off. Unauthorized personnel are kept clear of the spill area.
* Appropriate PPE is donned before entering the spill area.
* Appropriate spill control measures are applied during spill response.
* Whenever possible without endangerment of personnel, the spill is stopped at the source or as close to the source as possible.
* Ignition points are removed if fire or explosion hazards exist.
* Surrounding reactive materials are removed.
* Drains or drainage in the spill area are blocked or surrounded by berms to exclude the spilled waste and any materials applied to it.
* Provisions are made to contain and recover a neutralizing solution, if used.
* Small spills or leaks from a drum, tank, or pipe will require evacuation of at least 50 feet in all directions to allow clean-up and to prevent employee exposure. For small spills, sorbent materials such as sand, sawdust, or commercial sorbents are placed directly on the spill to prevent further spreading and aid in recovery.
* To dispose of spill waste, all contaminated sorbents, liquid waste, or other spill clean-up will be placed in small quantities in approved drums for proper storage or disposal as hazardous waste.

9.5 Post-Spill Evaluation

A written spill response report is prepared at the conclusion of clean-up operations. The report includes, at a minimum, the following information:

* date of spill incident
* cause of incident
* spill response actions
* any outside agencies involved, including their incident reports
* lessons learned or suggested improvements

The spill area is inspected to ensure the area has been satisfactorily cleaned. The use of surface and air sampling is utilized in this determination as necessary. The root cause of the spill is examined and

corrective steps taken to ensure the engineering and control measures in place have performed as required. If alternative precautions or measures are needed, they are made available and implemented.

All durable equipment placed into use during clean-up activities is decontaminated as specified in Chapter 10, Decontamination, for future utilization. All spill response equipment and supplies are re-stocked as required.

10.0 DECONTAMINATION

(in compliance with 29 CFR 1910.120(b)(4)(ii)(G) and 1910.120(k))

The decontamination chapter of the HASP describes how personnel and equipment are decontaminated when they leave the Exclusion Zone. This chapter also describes how residual waste from decontamination processes is disposed. Decontamination procedures are designed to achieve an orderly, controlled removal or neutralization of contaminants that may accumulate on personnel or equipment. These procedures minimize worker contact with contaminants and protect against the transfer of contaminants outside designated work zones. They also extend the useful life of PPE by reducing the amount of time that contaminants contact and permeate PPE surfaces. The decontamination procedures described below are designed to meet the requirements of 1910.120(k) and include project-specific information about:

* the location and type of project decontamination facilities
* general and specific decontamination procedures for personnel and PPE
* general and specific decontamination procedures for equipment
* disposal of residual waste from decontamination
* decontamination equipment and solutions
* the monitoring procedures used to evaluate the effectiveness of decontamination

The Project Manager overseas implementation of project decontamination procedures and is responsible for ensuring their effectiveness.

10.1 Decontamination Facilities

Decontamination is conducted in the contamination reduction zone (CRZ). The CRZ acts as a buffer between the exclusion zone and the support zone. The location and design of decontamination stations minimize the spread of contamination beyond these stations. Separate facilities are used for personnel and for equipment.

10.2 Decontamination Procedures for Personnel and PPE

Decontamination procedures are designed for the level of PPE used. Project-specific procedures for personnel and PPE decontamination minimize the potential for hazardous skin or inhalation exposure, cross-contamination, and chemical incompatibilities.

Based on the nature of the hazards and duration of work, showers and change rooms are not necessary and are not provided for workers.

The following are general decontamination procedures established and implemented during this project.

* Decontamination is required for all workers exiting a contaminated area. Personnel may re-enter the Support Zone only after undergoing the decontamination procedures described in the next section.
* Used protective clothing is discarded and replaced as needed to ensure its effectiveness.

* PPE that requires maintenance or parts replacement is decontaminated prior to repairs or service.
* PPE is decontaminated or prepared for disposal on the premises. Personnel who handle contaminated equipment have been trained in the proper means to do so to avoid hazardous exposure.
* Workers are required and trained to immediately exit the work zone, perform applicable decontamination procedures, shower, and change into uncontaminated clothing if their permeable clothing is splashed or becomes wetted with a hazardous substance.
* Procedures for decontamination waste disposal meet all applicable local, State, and Federal regulations.

10.3 Decontamination Procedures for Equipment

All tools, equipment, and machinery from the Exclusion Zone or CRZ are decontaminated in the CRZ prior to removal to the Support Zone. Equipment decontamination procedures are designed to minimize the potential for hazardous skin or inhalation exposure, cross-contamination, and chemical incompatibilities.

The following are general equipment decontamination procedures established and implemented during this project.

General Equipment Decontamination Procedures:

* *Equipment in the Exclusion Zone that can be used again, that is still operable, and that will not pose an increased exposure hazard during re-use is left in Exclusion Zone until it is no longer needed. This eliminates unnecessary decontamination and reduces the potential for physical transfer of contaminants outside the Exclusion Zone.*
* *Decontamination is required for all equipment exiting a contaminated area. Equipment may re-enter the Support Zone only after undergoing the equipment decontamination procedures.*
* *Equipment that is transported regularly between the contaminated and clean areas of the facility (e.g., monitoring equipment) is carefully decontaminated each time it is removed from the Exclusion Zone and the effectiveness of decontamination is monitored to reduce the likelihood that contamination will be spread outside designated work zones.*
* *Equipment that cannot be successfully decontaminated is disposed of as hazardous waste.*

10.4 Monitoring the Effectiveness of Decontamination Procedures

The effectiveness of decontamination can be assessed in a variety of ways. Examples of these methods include taking wipe samples of decontaminated equipment, wipe sampling internal and external surfaces of reusable chemical protective clothing, analyzing the final decontamination rinse water for the presence of contaminants, and visually inspecting PPE for signs of contamination following decontamination. The decontamination program must be revised if contaminants are not adequately removed by the decontamination procedures used.

Visual examination and sampling are used to evaluate the effectiveness of decontamination procedures, in compliance with 29 CFR 1910.120(k)(2)(iv). Visual examination is used to ensure that procedures are implemented as described and that they appear to control the spread of contaminants under changing conditions. Where feasible, visual examination is also used to inspect for signs of residual contamination or for contaminant permeation of PPE.

Both air sampling and surface sampling are used to verify the effectiveness of decontamination. Air samples are taken in the clean zone to ensure that airborne contaminants have not spread to clean areas of the facility. Surface samples are taken from the inside surfaces of PPE, from decontaminated equipment, and from surfaces within clean areas of the facility to ensure that decontamination and control procedures are performing as anticipated. The type and frequency of air and surface sampling used to ensure the effectiveness of decontamination procedures are detailed in the Exposure Monitoring chapter of this HASP (Chapter 6).

Results of the inspections of decontamination procedures and documentation of any action taken to correct deficiencies are recorded by the SSHO**.**

Personnel who work in contaminated areas, either the Contamination Reduction Zone (CRZ) or the Exclusion Zone, are trained in the principles and practices of decontamination described in this chapter of the HASP. If procedures are changed as a result of inspection and monitoring, all affected employees are notified of these changes.

Appendix A

Job Hazard Analysis

NYCO

JOB HAZARD ANALYSIS Ctrl. No. JHA-001	DATE October 26, 2018	__X__ NEW ____ REVISED

Site Specific JHA:	**WORK TYPE:**	**WORK ACTIVITY (Description):**
Fire Hydrant Replacement Project at Hunts Point Cooperative Market	Environmental Monitoring (CAMP) and Soil Sample Collection	Environmental Monitoring (CAMP) and Soil Sample Collection

DEVELOPMENT TEAM	POSITION / TITLE	REVIEWED BY:	POSITION / TITLE
Kristen Panella	Safety Consultant		
Paul Calzolano	Safety Consultant		

REQUIRED AND / OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

☐ LIFE VEST ☒ HARD HAT conforming to ANSI Z89.I 1986 Class B ☐ LONG SLEEVED SHIRT ☐ LIFELINE / BODY HARNESS ☒ SAFETY GLASSES conforming to ANSI Z 87.1	☐ GOGGLES ☐ FACE SHIELD ☐ HEARING PROTECTION ☒ SAFETY SHOES: Steel-toe boots/shoes recommended	☐ Particulate Respirator ☐ SUPPLIED RESPIRATOR ☒ PPE CLOTHING: fluorescent reflective vest Natural rubber over-boots and latex disposable boot covers	☒ GLOVES: Chemical resistant gloves manufactured from Nitrile when working with chemicals. Also Leather work gloves ☐ OTHER: Wear relatively tight and belted clothing.

EXCLUSION ZONE: A 10' exclusion zone will be maintained around heavy equipment. Larger equipment with an increased operating radius may need a larger exclusion zone. This should be defined prior to operating each piece of equipment.

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
Prior to start of work	Various construction site hazards	OSHA 10hr Construction Industry Safety Training. All workers on this HPCMI project will have a card on site certifying that they have completed the OSHA 10hr Construction Safety training within the past 5 years as required by the HPCMI.
	Potential hazards with CAMP direct read instruments	Training in the use of field monitoring devices . Equipment must be operated and serviced by qualified personnel only. Read and understand instruction manual completely before operating or servicing
	Reactions with poisonous plants	Employer should protect their workers from poisonous plants by training them about: 1. Their risk of exposure to poisonous plants 2. How to identify poisonous plants 3. How to prevent exposure to poisonous plants 4. What they should do if they are exposed to poisonous plants
	Insect Bites	1. Employers should protect their workers from stinging insects by training them about 2. Their risk of exposure 3. Insect identification 4. How to prevent exposure 5. What to do if stung

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB HAZARD ANALYSIS Ctrl. No. JHA-001	DATE October 26, 2018	__X__ NEW ____ REVISED

Site Specific JHA:	**WORK TYPE:**	**WORK ACTIVITY (Description):**
Fire Hydrant Replacement Project at Hunts Point Cooperative Market	Environmental Monitoring (CAMP) and Soil Sample Collection	Environmental Monitoring (CAMP) and Soil Sample Collection

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
Area Preparation	Employee Protection Slips, trips, falls, uneven surfaces	1. Physically inspect work areas prior to start of work 2. Follow good housekeeping practices: create walkways 3. Assure materials & debris do not block traffic 4. Keep work areas clean & neat, free from rubbish & debris 5. Watch where you walk. 6. Be cognizant of your own safe work practices as well as those of your co-workers 7. Be careful on slopes or wet/muddy areas 8. Flagmen will be utilized as required for roadway traffic if applicable 9. Appropriate warning signs will be posted if applicable
Working outdoors 	Heat Stress, Sunburn, Dehydration,	1. Adhere to the requirements in the Heat Stress Prevention Program 2. Monitoring work area heat conditions and worker physiological parameters 3. Recognize the signs and symptoms of heat stress illnesses or injury and what to do if these occur. 4. Drink plenty of water, and electrolyte drinks as needed. 5. Wear light-colored, cotton clothing. 6. Slow down work rate and increase breaks in hot weather. 7. Use sunscreen.
Working outdoors Biological hazards Poisonous plants 	Poisonous plants Allergic reactions.	1. Wear long sleeves, long pants, boots, and gloves. 2. Wash exposed clothing separately in hot water with detergent. 3. Barrier skin creams, such as a lotion containing bentoquatum, may offer some protection before contact. 4. Barrier creams should be washed off and reapplied twice a day. 5. After use, clean tools with rubbing alcohol (isopropanol or isopropyl alcohol) or soap and lots of water. Urushiol can remain active on the surface of objects for up to 5 years. 6. Wear disposable gloves during this process.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

NYCO

JOB HAZARD ANALYSIS Ctrl. No. JHA-001	DATE October 26, 2018	__X__ NEW ____ REVISED

Site Specific JHA:	**WORK TYPE:**	**WORK ACTIVITY (Description):**
Fire Hydrant Replacement Project at Hunts Point Cooperative Market	Environmental Monitoring (CAMP) and Soil Sample Collection	Environmental Monitoring (CAMP) and Soil Sample Collection

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
Working outdoors Biological hazards Insect Bites  	Severe allergic reactions	1. Wear light-colored, smooth-finished clothing. 2. Avoid perfumed soaps, shampoos, and deodorants. 3. Don't wear cologne or perfume. 4. Avoid bananas and banana-scented toiletries. 5. Wear clean clothing and bathe daily. (Sweat may anger bees.) 6. Wear clothing to cover as much of the body as possible. 7. Avoid flowering plants when possible. 8. Keep work areas clean. Social wasps thrive in places where humans discard food. 9. Remain calm and still if a single stinging insect is flying around. (Swatting at an insect may cause it to sting.) 10. If you are attacked by several stinging insects at once, run to get away from them. (Bees release a chemical when they sting, which may attract other bees.) 11. If a bee comes inside your vehicle, stop the car slowly, and open all the windows. 12. Workers with a history of severe allergic reactions to insect bites or stings should consider carrying an epinephrine auto injector (EpiPen) and should wear a medical identification bracelet or necklace stating their allergy. If a worker is stung by a bee, wasp, or hornet: 1. Have someone stay with the worker to be sure that they do not have an allergic reaction. 2. Wash the site with soap and water. 3. Remove the stinger using gauze wiped over the area or by scraping a fingernail over the area. 4. Never squeeze the stinger or use tweezers. 5. Apply ice to reduce swelling. 7. Do not scratch the sting as this may increase swelling, itching, and risk of infection.
Working outdoors 	Cold Stress, hypothermia	1. Protect exposed skin surfaces with appropriate clothing (such as face masks, hand wear, and footwear) that insulates, stays dry, and blocks wind 2. Shield the work area with windbreaks to reduce the cooling effects of wind 3. Use equipment for keeping workers' hands warm including warm air jets and radiant heaters in addition to insulated gloves 4. Use adequate insulating clothing to maintain a body core temperature of above 96.8°F

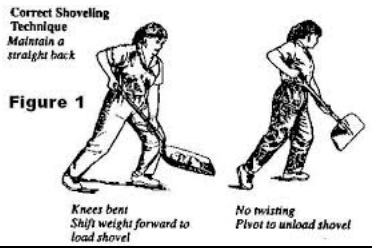
[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards.

[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB HAZARD ANALYSIS Ctrl. No. JHA-001	DATE October 26, 2018	__X__ NEW ____ REVISED

Site Specific JHA:	**WORK TYPE:**	**WORK ACTIVITY (Description):**
Fire Hydrant Replacement Project at Hunts Point Cooperative Market	Environmental Monitoring (CAMP) and Soil Sample Collection	Environmental Monitoring (CAMP) and Soil Sample Collection

Assess [1]JOB STEPS	Analyze [2]POTENTIAL HAZARDS	Act [3]CRITICAL ACTIONS
Shovels  	Shovels are the common tools of a soil evaluator. These tools rely on the physical ability of the user. Use of a shovel or auger can cause acute damage to the user's back or other muscles, especially if the operator is not used to using the equipment and/or is not in good physical condition.	Stretching before and after use can be helpful. If sharp pain or other evidence of back problems occurs, the shoveling should be stopped immediately and medical treatment should be sought.
DustTrak II monitors  	DustTrak II monitors are a Class I laser-based instrument. Exposure to this light may cause blindness.	1. During normal operation, you will not be exposed to laser radiation. There are no user serviceable parts inside the instrument. Do not open the instrument 2. Avoid exposure to hazardous radiation in the form of intense, focused, visible light. 3. Do not use controls, adjustments, or procedures other than those specified in the instrument manual.

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[3] Using the first two columns as a guide, decide what actions or procedures are necessary to eliminate or minimize the risk. List the recommended safe operating procedures. Say exactly what needs to be done - such as "use two persons to lift". Avoid general statements such as, "be careful".

JOB HAZARD ANALYSIS Ctrl. No. JHA-001		DATE October 26, 2018	__X__ NEW ____ REVISED
Site Specific JHA: Fire Hydrant Replacement Project at Hunts Point Cooperative Market	**WORK TYPE:** Environmental Monitoring (CAMP) and Soil Sample Collection	**WORK ACTIVITY (Description):** Environmental Monitoring (CAMP) and Soil Sample Collection	

Employee Signatures:	Date:

Employee Signatures:	Date:

A signed copy of this JHA must be posted while working on-site and be available to NYCO Environmental & Dewatering Corp managers upon request

[1] Each Job or Operation consists of a set of tasks / steps. Be sure to list all the steps needed to perform job.

[2] A hazard is a potential danger. Break hazards into five types: Contact - victim is struck by or strikes an object; Caught - victim is caught on, caught in or caught between objects; Fall - victim falls to ground or lower level (includes slips and trips); Exertion - excessive strain or stress / ergonomics / lifting techniques; Exposure - inhalation/skin hazards.

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Appendix B

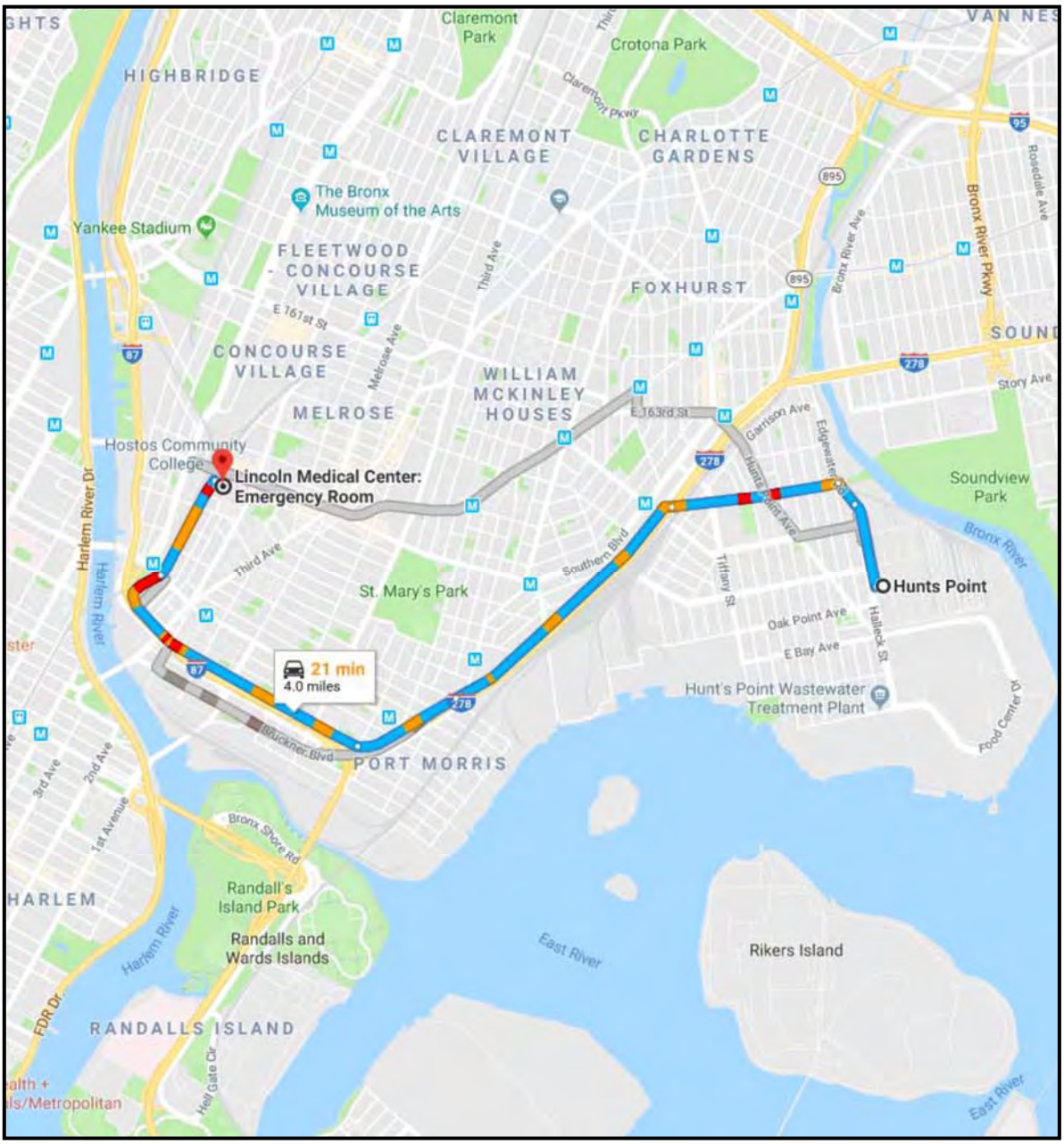
EMERGENCY CONTACT INFORMATION

Job Number:	**Location** Hunts Point Peninsula Bronx NY
Circuit Number:	**Project Manager:** Matt Durcan, matt@nycoenv.com Cell: 631-630-6700
Description of Work: The Fire Hydrant Replacement project includes the excavation, removal, and replacement of 26 Fire Hydrants located around the HPCM	
EMERGENCY CONTACT INFORMATION	
CONTACT NAME	**TELEPHONE NUMBER**
Local Emergency Medical Services **Police Emergency** **Fire Emergency**	911
Local Police Non-Emergency Number	New York City Police Department 45th Precinct 1035 Longwood Ave, Bronx, NY 10459 718-542-4771
Local Fire Dept. Non-Emergency Number	Fire Department New York City Engine 94 / Ladder 48 / Battalion 3 1226 Seneca Ave, Bronx, NY 10474
Nearest Hospital **Name:** **Location:** **Directions: Refer to Attached Map**	Lincoln Medical Center: Emergency Room 234 Eugenio Maria De Hostos Blvd (East 149th Street) Bronx, New York 10451 (Between Park and Morris Avenues) 718-579-5000
NYCO Safety Representative **Name:**	Sam McTavey Cell 914-643-1057
NYCO Site Supervisor **Name:**	Chris LaFonte Cell: 203-788-3169
HPCM Contact Person **Name:**	Bruce Reingold
HPCM Safety Representative **Name:**	TBD
NYCO Corporate Health and Safety Director:	Name: Sam McTavey Title: Safety Director/ Senior Project Manager Cell Phone: 914-643-1057 Email: sam@nycoenv.com
NYCO Main Office	NYCO Environmental & Dewatering Corp. 200 Blydenburg Road, Suite 19 Islandia, NY 11749 Phone: (631) 630-6700

Appendix C

Route to Hospital Map

Route to Hospital Map



NYCO Environmental & Dewatering **200 Blydenburg Road, Suite 19** **Islandia, NY 11749**	**Site Specific Health and Safety Plan** **Job Site: Fire Hydrant Replacement Project at Hunts Point Cooperative Market**

Directions

Take Bruckner Blvd and E 135th St to Park Ave

16 min (3.2 mi)

2. Continue onto Edgewater Rd

0.1 mi

3. Turn left onto Lafayette Ave

0.6 mi

4. Turn left onto Bruckner Blvd

1.0 mi

5. Keep right to stay on Bruckner Blvd

0.4 mi

6. Continue onto E 135th St

1.1 mi

Follow Park Ave to your destination

2 min (0.4 mi)

7. Continue onto Park Ave

0.4 mi

8. Turn right

148 ft

Lincoln Medical Center: Emergency Room

Appendix D

Safety Data Sheets

(SDS)

Safety Data Sheet

Ammonia Solution, Household

Section 1 Product Description

Product Name:	Ammonia Solution, Household
Recommended Use:	Science education applications
Synonyms:	Ammonia Aqueous, Aqua Ammonia, Ammonium Solution
Distributor:	Carolina Biological Supply Company 2700 York Road, Burlington, NC 27215 1-800-227-1150
Chemical Information:	800-227-1150 (8am-5pm (ET) M-F)
Chemtrec:	800-424-9300 (Transportation Spill Response 24 hours)

Section 2 Hazard Identification

Classification of the chemical in accordance with paragraph (d) of §1910.1200;

DANGER

Harmful if swallowed. Causes severe skin burns and eye damage. Causes serious eye damage. Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

GHS Classification:
Skin Corrosion/Irritation Category 1A, Serious Eye Damage/Eye Irritation Category 1, Hazardous to the aquatic environment - Acute Category 1, Hazardous to the aquatic environment - Chronic Category 2, Acute Toxicity - Oral Category 4

Section 3 Composition / Information on Ingredients

Chemical Name	CAS #	%
Water	7732-18-5	90
Ammonium Hydroxide	1336-21-6	10

Section 4 First Aid Measures

Emergency and First Aid Procedures

Inhalation:	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Eyes:	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Skin Contact:	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.
Ingestion:	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

Section 5 Firefighting Procedures

Extinguishing Media:	Use dry chemical, CO2 or appropriate foam.
Fire Fighting Methods and Protection:	Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.
Fire and/or Explosion Hazards:	Dangerous fire hazard; emits irritating fumes and liquid can inflict burns. Ammonia hydroxide is non-combustible and non explosive, but ammonia vapors released from solution can form an explosive mixture in air.
Hazardous Combustion Products:	Carbon dioxide, Carbon monoxide

Section 6 Spill or Leak Procedures

Steps to Take in Case Material Is Released or Spilled: Exposure to the spilled material may be severely irritating or toxic. Follow personal protective equipment recommendations found in Section 8 of this SDS. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred, and the expertise of employees in the area responding to the spill. Never exceed any occupational exposure limits. Wear a self-contained breathing apparatus and appropriate Personal protection. (See Section 8.) Ventilate the contaminated area. Persons not wearing appropriate protective equipment should be excluded from area of spill until clean-up has been completed.
Prevent the spread of any spill to minimize harm to human health and the environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section 8 at a minimum. Dike with suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal evaluation. Avoid creating dusts. Cover material with absorbent and moisten and collect for disposal. Collect spillage.

Section 7 Handling and Storage

Handling: Do not breathe dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling. Do no eat, drink or smoke when using this product. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. Keep away from ... (incompatible materials to be indicated by the manufacturer). Do not breathe dust/vapor. Do not get in eyes, on skin, or on clothing. Retained residue may make empty containers hazardous; use caution.

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

Storage Code: White - Corrosive. Separate acids from bases; separate oxidizer acids from organic acids.

Section 8 Protection Information

	ACGIH		OSHA PEL	
Chemical Name	**(TWA)**	**(STEL)**	**(TWA)**	**(STEL)**
No data available	N/A	N/A	N/A	N/A

Control Parameters

Engineering Measures: No exposure limits exist for the constituents of this product. General room ventilation might be required to maintain operator comfort under normal conditions of use.

Personal Protective Equipment (PPE): Lab coat, apron, eye wash, safety shower.

Respiratory Protection: No respiratory protection required under normal conditions of use.

Eye Protection: Wear chemical splash goggles when handling this product. Have an eye wash station available.

Skin Protection: Avoid skin contact by wearing chemically resistant gloves, an apron and other protective equipment depending upon conditions of use. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when leaving work.

Gloves: Butyl rubber, Impervious rubber, Natural latex,, Natural rubber, Nitrile - Extra Thick (8 mm)

Section 9 Physical Data

Formula: NH4 * OH
Molecular Weight: 35.06
Appearance: Colorless
Odor: Strong Ammonia
Odor Threshold: No data available
pH: No data available
Melting Point: No data available
Boiling Point: 100 C
Flash Point: No data available
Flammable Limits in Air: NH3 gas LEL 16% UEL 25%
Vapor Pressure: 115 mmHg at 20 °C for 10% solution
Evaporation Rate (BuAc=1): N/A
Vapor Density (Air=1): 0.6 NH3
Specific Gravity: 0.9
Solubility in Water: Soluble
Log Pow (calculated): No data available
Autoignition Temperature: No data available
Decomposition Temperature: No data available
Viscosity: No data available
Percent Volatile by Volume: 100%

Section 10 Reactivity Data

Reactivity: No data available
Chemical Stability: Stable under normal conditions.
Conditions to Avoid: None known.
Incompatible Materials: Water-reactive materials, Copper, Iron Salts, Zinc
Hazardous Polymerization: Will not occur

Section 11 Toxicity Data

Routes of Entry Inhalation.
Symptoms (Acute): Respiratory disorders
Delayed Effects: No data available

Acute Toxicity:

Chemical Name	CAS Number	Oral LD50	Dermal LD50	Inhalation LC50
Water	7732-18-5	Oral LD50 Rat 90000 mg/kg		
Ammonium Hydroxide	1336-21-6	Oral LD50 Rat = 350 mg/kg		INHALATION LC50 Mouse 4500 ppm INHALATION LC50 Mouse 21430 ppm INHALATION LC50 Rat 9500 ppm

Carcinogenicity:

Chemical Name	CAS Number	IARC	NTP	OSHA
No data available		Not listed	Not listed	Not listed

Chronic Effects:
Mutagenicity: No evidence of a mutagenic effect.
Teratogenicity: No evidence of a teratogenic effect (birth defect).
Sensitization: No evidence of a sensitization effect.
Reproductive: No evidence of negative reproductive effects.
Target Organ Effects:
Acute: See Section 2
Chronic: Mutation data cited., Not listed as a carcinogen by IARC, NTP or OSHA.

Section 12 Ecological Data

Overview: Extreme ecological hazard. This product may be highly toxic to plants and/or wildlife. Keep out of waterways.
Mobility: No data
Persistence: No data
Bioaccumulation: No data
Degradability: No data
Other Adverse Effects: No data

Chemical Name	CAS Number	Eco Toxicity
Water	7732-18-5	No data available
Ammonium Hydroxide	1336-21-6	96 HR LC50 PIMEPHALES PROMELAS 8.2 MG/L 48 HR EC50 DAPHNIA PULEX 0.66 MG/L 48 HR EC50 WATER FLEA 0.66 MG/L

Section 13 Disposal Information

Disposal Methods: Dispose in accordance with all applicable Federal, State and Local regulations. Always contact a permitted waste disposer (TSD) to assure compliance.
Waste Disposal Code(s): Not Determined

Safety Data Sheet

Section 14 Transport Information

Ground - DOT Proper Shipping Name:
*** Consumer commodity/ORM-D for 500 ml and 4 L bottles. ***

Air - IATA Proper Shipping Name:
Not regulated for air transport by IATA.

Section 15 Regulatory Information

TSCA Status: All components in this product are on the TSCA Inventory.

Chemical Name	CAS Number	§ 313 Name	§ 304 RQ	CERCLA RQ	§ 302 TPQ	CAA 112(2) TQ
Ammonium Hydroxide	1336-21-6	No	1000 lb RQ	1000 lb final RQ; 454 kg final RQ	No	No

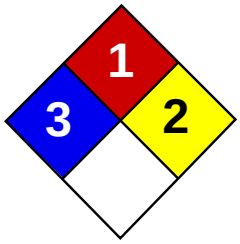
Section 16 Additional Information

Revised: 09/09/2015 **Replaces: 08/19/2015** **Printed: 10-29-2015**

The information provided in this (Material) Safety Data Sheet represents a compilation of data drawn directly from various sources available to us. Carolina Biological Supply makes no representation or guarantee as to the suitability of this information to a particular application of the substance covered in the (Material) Safety Data Sheet.

Glossary

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
CAS	Chemical Abstract Service Number	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
DOT	U.S. Department of Transportation	ppm	Parts per million
IARC	International Agency for Research on Cancer	RCRA	Resource Conservation and Recovery Act
N/A	Not Available	SARA	Superfund Amendments and Reauthorization Act
		TLV	Threshold Limit Value
		TSCA	Toxic Substances Control Act
		IDLH	Immediately dangerous to life and health



Health	3
Fire	1
Reactivity	2
Personal Protection	E

Material Safety Data Sheet
Arsenic MSDS

Section 1: Chemical Product and Company Identification

Product Name: Arsenic

Catalog Codes: SLA1006

CAS#: 7440-38-2

RTECS: CG0525000

TSCA: TSCA 8(b) inventory: Arsenic

CI#: Not applicable.

Synonym:

Chemical Name: Arsenic

Chemical Formula: As

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Arsenic	7440-38-2	100

Toxicological Data on Ingredients: Arsenic: ORAL (LD50): Acute: 763 mg/kg [Rat]. 145 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, lungs, the nervous system, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat, of oxidizing materials.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Material in powder form, capable of creating a dust explosion. When heated to decomposition it emits highly toxic fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable

protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.01 from ACGIH (TLV) [United States] [1995] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 74.92 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: Not available.

Melting Point: Sublimation temperature: 615°C (1139°F)

Critical Temperature: Not available.

Specific Gravity: 5.72 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents, acids, moisture.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 145 mg/kg [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH. Causes damage to the following organs: kidneys, lungs, the nervous system, mucous membranes.

Other Toxic Effects on Humans:
Very hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Arsenic UNNA: UN1558 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Arsenic California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Arsenic Pennsylvania RTK: Arsenic Massachusetts RTK: Arsenic TSCA 8(b) inventory: Arsenic

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R22- Harmful if swallowed. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 2

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 1

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Liste des produits purs tératogènes, mutagènes, cancérogènes. Répertoire toxicologique de la Commission de la Santé et de la Sécurité du Travail du Québec. -Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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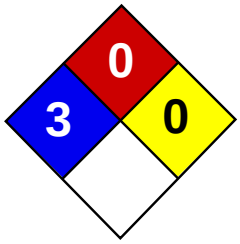

Material Safety Data Sheet
Sodium Cyanide MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sodium Cyanide

Catalog Codes: SLS2314, SLS3736

CAS#: 143-33-9

RTECS: VZ7525000

TSCA: TSCA 8(b) inventory: Sodium Cyanide

CI#: Not available.

Synonym:

Chemical Name: Sodium Cyanide

Chemical Formula: NaCN

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sodium Cyanide	143-33-9	100

Toxicological Data on Ingredients: Sodium Cyanide: ORAL (LD50): Acute: 6.44 mg/kg [Rat]. DERMAL (LD50): Acute: 10.4 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (permeator). Corrosive to eyes and skin. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to skin, eyes, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of acids, of moisture.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Dangerous on contact with acids, acid fumes, water or stream. It will produce toxic and flammable vapors of CN-H and sodium oxide. Contact with acids and acid salts causes immediate formation of toxic and flammable hydrogen cyanide gas. When heated to decomposition it emits toxic fumes hydgrogen cyanide and oxides of nitrogen

Special Remarks on Explosion Hazards: Fusion mixtures of metal cyanides with metal chlorates, perchlorated or nitrates causes a violent explosion

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Corrosive solid. Poisonous solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 24°C (75.2°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
STEL: 5 (mg/m3) from ACGIH (TLV) [United States] SKIN CEIL: 4.7 from NIOSH CEIL: 5 (mg/m3) from NIOSHConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Granular solid. Flakes solid.)

Odor:
Faint almond-like odor. Odorless when perfectly dry. Emits odor of hydrogen cyanide when damp.

Taste: Not available.

Molecular Weight: 49.01 g/mole

Color: White.

pH (1% soln/water): Not available.

Boiling Point: 1496°C (2724.8°F)

Melting Point: 563°C (1045.4°F)

Critical Temperature: Not available.

Specific Gravity: 1.595 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Vapor Density of Hydrogen Cyanide gas: 0.941

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Soluble in cold water. Slightly soluble in Ethanol

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, moisture, incompatibles.

Incompatibility with various substances: Reactive with oxidizing agents, acids, moisture.

Corrosivity:
Corrosive in presence of aluminum. Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Violent reaction with fluorine gas, magnesium, nitrates, nitric acid. Dangerous on contact with acids, acid fumes, water or stream. It wil produce toxic and flammable vapors of CN-H and sodium oxide. Cyanide may react with CO2 in ordinary air to form toxic hydrogen cyanide gas. Strong oxidizers such as acids, acid salts, chlorates, and nitrates. Contact with acids and acid salts causes immediate formation of toxic and flammable hydrogen cyanide gas.

Special Remarks on Corrosivity: Corrosive to aluminum

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 6.44 mg/kg [Rat]. Acute dermal toxicity (LD50): 10.4 mg/kg [Rabbit].

Chronic Effects on Humans: May cause damage to the following organs: skin, eyes, central nervous system (CNS).

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: May cause adverse reproductive effects (maternal and paternal fertility) based on animal data.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health effects: Skin: May cause itching and irritation. May be fatal if absorbed through injured skin with symtpoms similar to those noted for inhalation and ingestion. Eyes: May cause eye irritation and eye damage. Inhalation: May cause respiratory tract irritation. May be fatal if inhaled. The substance inhibits cellular respiration causing metabolic asphyxiation. May cause headache, weakness, dizziness, labored breathing, nausea, vomiting. May be followed by cardiovascular effects, unconciousness, convulsions, coma, and death Ingestion: May be fatal if swallowed. May cause

gastrointestinal tract irritation with nausea, vomiting. May affect behavior and nervous systems(seizures, convulsions, change in motor activity, headache, dizziness, confusion, weakness stupor, aniexity, agitation, tremors), cardiovascular system, respiration (hyperventilation, pulmonary edema, breathing difficulty, respiratory failure), cardiovascular system (palpitations, rapid heart beat, hypertension, hypotension). Massive doses by produce sudden loss of conciousness and prompt death from respiratory arrest. Smaller but still lethal doses on the breath or vomitus. Chronic Potential Health Effects: Central Nervous system effects (headaches, vertigo, insomnia, memory loss, tremors, fatigue), fatigue, metabolic effects (poor appetite), cardiovascular effects (chest discomfort, palpitations), nerve damage to the eyes, or dermatitis, respiratory tract irritation, eye irritation, or death can occur. may prolong the illness for 1 or more hours. A bitter almond odor may be noted

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Sodium cyanide UNNA: 1689 PG: I

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut carcinogen reporting list.: Sodium Cyanide Illinois chemical safety act: Sodium Cyanide New York release reporting list: Sodium Cyanide Rhode Island RTK hazardous substances: Sodium Cyanide Pennsylvania RTK: Sodium Cyanide Minnesota: Sodium Cyanide Massachusetts RTK: Sodium Cyanide Massachusetts spill list: Sodium Cyanide New Jersey: Sodium Cyanide New Jersey spill list: Sodium Cyanide Louisiana RTK reporting list: Sodium Cyanide Louisiana spill reporting: Sodium Cyanide California Director's List of Hazardous Substances: Sodium Cyanide TSCA 8(b) inventory: Sodium Cyanide TSCA 4(a) final test rules: Sodium Cyanide TSCA 8(a) PAIR: Sodium Cyanide TSCA 8(d) H and S data reporting: Sodium Cyanide TSCA 12(b) one time export: Sodium Cyanide SARA 302/304/311/312 extremely hazardous substances: Sodium Cyanide CERCLA: Hazardous substances.: Sodium Cyanide: 10 lbs. (4.536 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-6: Reactive and very flammable material. CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS E: Corrosive solid.

DSCL (EEC):
R27/28- Very toxic in contact with skin and if swallowed. R41- Risk of serious damage to eyes. S1/2- Keep locked up and out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S28- After contact with skin, wash immediately with plenty of water S36/37- Wear suitable protective clothing and gloves. S39- Wear eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 0

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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HOVENSA

MATERIAL SAFETY DATA SHEET

Sulfur **MSDS No. 1794**

EMERGENCY OVERVIEW
DANGER!
FLAMMABLE SOLID - BURNING SULFUR EMITS TOXIC AND SUFFOCATING SULFUR DIOXIDE - MOLTEN SULFUR MAY EVOLVE TOXIC AND FLAMMABLE HYDROGEN SULFIDE GAS -

NFPA 704 (Section 16)

MOLTEN SULFUR CAN CAUSE THERMAL BURNS

Solid and molten sulfur can be ignited; burning sulfur produces sulfur dioxide, an irritating, toxic, and suffocating gas.

Dust particles may be irritating to the eyes, nose, throat, and skin. Molten sulfur can cause thermal burns.

Molten sulfur may evolve HYDROGEN SULFIDE (toxic gas) which may accumulate in storage container vapor space. High concentration may cause immediate unconsciousness - death may result unless victim is promptly and successfully resuscitated. Hydrogen sulfide causes eye irritation.

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

HOVENSA LLC
1 Estate Hope
Christiansted, VI 00820-5652

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC (800)424-9300**
COMPANY CONTACT (business hours): **(340) 692-3000**

SYNONYMS: Brimstone; Sulphur

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and CHEMICAL INFORMATION ON INGREDIENTS

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Sulfur (7704-34-9)	100
Hydrogen Sulfide (7783-06-4)	< trace - see below >

Hydrogen Sulfide (H_2S) may be present in trace quantities (by weight) in molten sulfur but may accumulate to toxic or flammable concentrations in enclosed spaces such as molten sulfur storage pits, tanks, or tanker/railcar headspaces. H_2S is not considered a hazard associated with solid sulfur.

3. HAZARDS IDENTIFICATION

EYES

Contact with molten sulfur may cause serious burns and blindness. Sulfur vapor may cause eye irritation. Dust contact with eyes may cause mechanical irritation (abrasion), characterized by a scratchy discomfort. This may progress to burning and tearing, with blurring of vision upon repeated or prolonged exposure. These symptoms are generally reversible once exposure is discontinued. Excessive exposure may cause more severe symptoms such as redness, pain, sensitivity to light, and conjunctivitis. Some severe exposure cases have resulted in permanent damage.

Exposure to approximately 8 ppm sulfur vapor has been shown to cause eye irritation.

SKIN
Prolonged contact with sulfur dust in a localized area may result in irritation, primarily from abrasive action. Molten sulfur may cause 1st, 2nd, or 3rd degree thermal burns.

INGESTION
Ingestion of small amounts of solid sulfur should not cause significant health effects. Large does can produce mucous membrane irritation, difficult swallowing, redness of the throat and tongue, stomach, and urinary disturbances. Vomiting, abdominal pain and diarrhea may also occur. Long-term ingestion of small amounts may have a laxative effect. Ingestion of very large amounts may cause sore throat, nausea, headache, and possibly unconsciousness in severe cases. May be converted into hydrogen sulfide in the intestine.

INHALATION
Inhalation of low concentrations of dust should not cause significant health effects. Inhalation of large amounts of dust may cause inflammation of the nose and throat, resulting in secretions from the nose. Symptoms include sore throat, tightness of the chest, chest pain, lightheadedness, and persistent cough with sputum.

WARNING: Irritating and toxic hydrogen sulfide gas may be found in confined vapor spaces. Greater than 15 - 20 ppm continuous exposure can cause mucous membrane and respiratory tract irritation. 50 - 500 ppm can cause headache, nausea, and dizziness, loss of reasoning and balance, difficulty in breathing, fluid in the lungs, and possible loss of consciousness. Greater than 500 ppm can cause rapid or immediate unconsciousness due to respiratory paralysis and death by suffocation unless the victim is removed from exposure and successfully resuscitated.

The "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm. At high concentrations, the victim may not even recognize the odor before becoming unconscious.

CHRONIC
Long-term exposure to high concentrations can cause respiratory disease - see Section 11, Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Exposure may aggravate preexisting bronchitis, asthma, and open wounds, skin disorders, and dermatitis (rash).

4. FIRST AID MEASURES

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

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

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.

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.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

FLASH POINT:	405 ^{o}F (207 ^{o}C)
AUTOIGNITION TEMPERATURE:	450 ^{o}F (232 ^{o}C)
LOWER EXPLOSIVE LIMIT (%):	35 gm/m^3 (dust); 4% for hydrogen sulfide
UPPER EXPLOSIVE LIMIT (%):	1,400 gm/m^3 (dust); 44% for hydrogen sulfide

FIRE AND EXPLOSION HAZARDS

Reference NFPA 655 "Prevention of Sulfur Fires and Explosions," 1993.

Flammable solid with a relatively low ignition temperature. Sulfur dust ignites easily in air. Grinding sulfur may produce an explosion hazard. Static discharge may ignite sulfur dust.

Sulfur burns with a pale blue flame that may be difficult to see in daylight. Burning sulfur will flow and emits large quantities of sulfur dioxide (SO_2), a toxic, irritating, and suffocating gas that can cause severe lung damage and death.

Molten sulfur may evolve hydrogen sulfide (H_2S) - H_2S is a flammable gas and may present an explosion hazard in a confined space. Under certain conditions, H_2S can react to form pyrophoric iron compounds in enclosed spaces such as sulfur pits.

EXTINGUISHING MEDIA

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

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

FIRE FIGHTING INSTRUCTIONS

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

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

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

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Product may release substantial amounts of flammable vapors and gases (e.g., methane, ethane, and propane), at or below ambient temperature depending on source and process conditions and pressure.

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

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

7. HANDLING and STORAGE

HANDLING and STORAGE PRECAUTIONS

Store solid sulfur in a well ventilated area away from incompatible materials. The hazards of hydrogen sulfide should be considered when storing or transporting molten sulfur. H2S can accumulate in confined spaces such as sulfur pits and headspaces of truck trailers and railcars. Exposure to H2S is possible during product transfer into/out of truck trailers and railcars.

Use appropriate engineering controls or respiratory protection. Sulfur pits should be vented away from possible worker exposure areas.

Prohibit smoking in storage and work areas. Electrical installations and equipment in hazardous locations should be installed according to articles 501 and 502 of the National Electric Code. Reference also NFPA 655 Standard for the Prevention of Sulfur Fires and Explosions.

WORK/HYGIENIC PRACTICES

Protect against hot liquid. 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 gasoline or solvents (naphtha, kerosene, etc.) for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

EXPOSURE LIMITS

Components (CAS No.)	Source	Exposure Limits TWA/STEL	Note
Sulfur (17704-34-9)	OSHA ACGIH	PEL = None established TLV = None established	
Hydrogen Sulfide (H_2S) (7783-06-4)	OSHA ACGIH	PEL = 20ppm; STEL = 50 ppm TLV = 10 ppm; STEL = 15 ppm	 2006 NOIC 1/5 ppm

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor, hydrogen sulfide and dust concentrations of this product below occupational exposure limits and flammability limits, particularly in confined spaces. Use explosion-proof equipment and lighting in classified/controlled areas.

EYE/FACE PROTECTION

Safety goggles are recommended for excessive dust exposure. Use faceshield for protection against molten sulfur.

SKIN PROTECTION
Avoid repeated or prolonged skin contact. For protection from molten sulfur, gloves and skin protection constructed of leather or heat resistant materials are recommended.

RESPIRATORY PROTECTION
If a hydrogen sulfide hazard is present (that is, exposure potential above H_2S permissible exposure limit), use a positive-pressure SCBA or Type C supplied air respirator with escape bottle.

Dust protection: where it has been determined that there is no hydrogen sulfide exposure hazard (that is, exposure potential below H_2S permissible exposure limit), a NIOSH/ MSHA-approved air-purifying respirator with dust cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

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

9. PHYSICAL and CHEMICAL PROPERTIES

APPEARANCE
Yellow solid in block or pellet for; easily crushed into yellow dust. Hot, yellow liquid

ODOR
Pure sulfur is odorless and tasteless. However, trace hydrocarbon impurities may give it a faint oily and/or rotten egg odor.

Hydrogen sulfide (H_2S) has a rotten egg “sulfurous” odor. This odor should not be used as a warning property of toxic levels because H_2S can overwhelm and deaden the sense of smell. Also, the odor of H_2S in heavy oils can easily be masked by the petroleum-like odor of the oil. Therefore, the smell of H_2S should not be used as an indicator of a hazardous condition - a H_2S meter or colorimetric indicating tubes are typically used to determine the concentration of H_2S.

BASIC PHYSICAL PROPERTIES

BOILING POINT:	832 ^{o}F (445 ^{o}C)
MELTING POINT:	235 to 248 ^{o}F (113 to 120 ^{o}C)
VAPOR PRESSURE:	4x10-6 mm Hg @ 86 ^{o}F (30 ^{o}C)
SPECIFIC GRAVITY (H_2O = 1):	AP 1.96 (varies)
PERCENT VOLATILES:	Negligible
SOLUBILITY:	Insoluble in water

10. STABILITY and REACTIVITY

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS
Avoid high temperatures, open flames, welding, smoking and ignitions sources. Under certain conditions, H_2S can react to form pyrophoric iron compounds in enclosed spaces such as sulfur pits. Exposure of pyrophoric compounds to air or moisture can cause excessive heat generation, smoke and toxic gases, and fire.

INCOMPATIBLE MATERIALS

Sulfur is incompatible with a number of chemical materials including, but not limited to, chlorates, nitrates, other oxidizers, carbides, halogens, phosphorus, and heavy metals. This incompatibility may result in fire, excessive heat generation, uncontrolled reaction, release of toxic products and/or explosion. A comprehensive list of incompatible materials may be found in the latest edition of Sax's "Dangerous Properties of Industrial Materials" and the NFPA "Hazardous Materials Guide".

HAZARDOUS DECOMPOSITION PRODUCTS:

Sulfur burns to sulfur dioxide. Sulfur reactions with hydrocarbons and other organic materials may produce hydrogen sulfide and carbon disulfide. Other possibly toxic reaction or decomposition products are highly dependent on the incompatible material.

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY

Large doses (15 grams) by mouth may lead to hydrogen sulfide production in the body, chiefly due to bacterial action within the colon.

Rat-oral LD50 = 175 mg/kg

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenicity: **OSHA:** NO **IARC:** NO **NTP:** NO **ACGIH:** NO

Prolonged inhalation of dust over several years (as demonstrated in miners) may cause respiratory disease, complicated by emphysema and bronchiectasis. Asthma and inflammation of the frontal and maxillary sinuses are frequent complications. Pulmonary function may be reduced showing increased oxygen consumption, reduced respiratory volume, and impaired carbon dioxide diffusion capacity. Radiological examinations have revealed irregular opacities in the lungs and nodulation.

12. ECOLOGICAL INFORMATION

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

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORTATION INFORMATION

	DOMESTIC SHIPMENT	INTERNATIONAL SHIPMENT
PROPER SHIPPING NAME:	SULFUR	SULFUR
HAZARD CLASS, PACKING GROUP:	9, PG III	4.1, PG III
DOT IDENTIFICATION NUMBER:	NA 1350	UN 1350
DOT SHIPPING LABEL:	CLASS 9	FLAMMABLE SOLID
PROPER SHIPPING NAME:	SULFUR, MOLTEN	SULFUR, MOLTEN
HAZARD CLASS, PACKING GROUP:	9, PG III	4.1, PG III
DOT IDENTIFICATION NUMBER:	NA 2448	UN 2448
DOT SHIPPING LABEL:	CLASS 9	FLAMMABLE SULFUR

15. REGULATORY INFORMATION

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

Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

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

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)
The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

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

SARA SECTION 313 - SUPPLIER NOTIFICATION
This product does not contain any chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372.

CALIFORNIA PROPOSITON 65 LIST OF CHEMICALS
This product does not contain chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986.

CANADIAN REGULATORY INFORMATION (WHMIS)
Class B, Division 4 (Flammable Solid) and Class D, Div 1A (Very Toxic material - hydrogen sulfide)

NFPA® HAZARD RATING

HEALTH:	1
FIRE:	1
REACTIVITY:	0

Refer to NJPA 704 "Identification of the Fire Hazards of Materials" for further information

HMIS® HAZARD RATING

HEALTH:	1 *	Slight
FIRE:	1	Moderate
Physical:	0	Negligible
		* Chronic

SPECIAL HAZARDS: Toxic and flammable hydrogen sulfide (poison gas) may accumulate in the vapor space of molten sulfur storage container

SUPERSEDES MSDS DATED: 03/22/2000

ABBREVIATIONS:

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

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute (212) 642-4900
API	American Petroleum Institute (202) 682-8000
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation [General info: (800) 467-4922]
EPA	U.S. Environmental Protection Agency
HMIS	Hazardous Materials Information System
IARC	International Agency For Research On Cancer
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association (617)770-3000
NIOSH	National Institute of Occupational Safety and Health
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
NTP	National Toxicology Program
OPA	Oil Pollution Act of 1990
OSHA	U.S. Occupational Safety & Health Administration
PEL	Permissible Exposure Limit (OSHA)
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit (NIOSH)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA	Self-Contained Breathing Apparatus
SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-Term Exposure Limit (generally 15 minutes)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average (8 hr.)
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Canadian Workplace Hazardous Materials Information System

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name
CRUDE COKE OVEN TAR, CRUDE COAL TAR

Synonyms
CENTRIFUGE TAR

Product Use
process chemical.

Restrictions on Use
None known.

Details of the supplier of the safety data sheet

KOPPERS INC.
436 Seventh Avenue
Pittsburgh, PA 15219-1800
Mfg Contact: 412-227-2001 (SDS Requests: 866-852-5239)

CHEMTREC: 800-424-9300 (Outside USA: +1 703-527-3887)
Emergencies: (Medical in USA): 877-737-9047
Emergencies: (Medical Outside of USA): 651-632-9269
E-mail: naorgmsds@koppers.com

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.
Acute Toxicity - Dermal - Category 4
Acute Toxicity - Inhalation - Dust/Mist - Category 3
Skin Corrosion/Irritation - Category 2
Serious Eye Damage/Eye Irritation - Category 2A
Skin Sensitization - Category 1
Germ Cell Mutagenicity - Category 1B
Carcinogenicity - Category 1A
Reproductive Toxicity - Category 1B
Specific target organ toxicity - Single exposure - Category 1 (blood , respiratory system , kidneys , nervous system , heart)
Specific target organ toxicity - Single exposure - Category 2 (eyes)
Specific Target Organ Toxicity - Repeated Exposure - Category 1 (blood , eyes , respiratory system , central nervous system)
Hazardous to the Aquatic Environment - Acute - Category 2
Hazardous to the Aquatic Environment - Chronic - Category 2

GHS Label Elements

Symbol(s)

Signal Word
Danger

Hazard Statement(s)

Toxic if inhaled.
Harmful in contact with skin.
Causes skin irritation.
Causes serious eye irritation.
May cause an allergic skin reaction.
May cause genetic defects.
May cause cancer.
May damage fertility or the unborn child.
Causes damage to organs. (blood , respiratory system , kidneys , nervous system , heart)
May cause damage to organs. (eyes)
Causes damage to organs through prolonged or repeated exposure. (blood , eyes , respiratory system , central nervous system)
Toxic to aquatic life with long lasting effects.

Precautionary Statement(s)

Prevention

Do not breathe vapor or mist.
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Do not eat, drink or smoke when using this product.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/protective clothing/eye protection/face protection.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Avoid release to the environment.

Response

IF exposed or concerned: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER or doctor/physician.
IF ON SKIN: Wash with plenty of soap and water.
Call a POISON CENTER or doctor/physician if you feel unwell.
If skin irritation or rash occurs: Get medical advice/attention.
Take off contaminated clothing and wash before reuse.
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.
Collect spillage.

Storage

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

Disposal

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

Statement(s) of Unknown Acute Toxicity

Dermal	72% of the mixture consists of ingredient(s) of unknown acute toxicity.
Inhalation	97% of the mixture consists of ingredient(s) of unknown acute toxicity.

Other Hazards

Heated material may cause thermal burns.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
65996-89-6	Tar, coal, high-temperature	100
-	The above listed complex substance contains the following constituents	-
Not Available	POLYCYCLIC AROMATIC HYDROCARBONS	7.0-31.0
91-20-3	Naphthalene	3.0-12.0
85-01-8	Phenanthrene	2.5-7.5
206-44-0	Fluoranthene	1.5-5.0
120-12-7	Anthracene	0.7-4.0
83-32-9	Acenaphthene	0.10-3.0
205-99-2	Benzo(b)fluoranthene	0.4-2.5
132-64-9	Dibenzofuran	1.0-2.5
50-32-8	Benzo[a]pyrene	0.1-2.0
56-55-3	Benz[a]anthracene	0.5-1.6
207-08-9	Benzo(k)fluoranthene	0.1-1.5
218-01-9	Chrysene	0.1-1.5
193-39-5	Indeno(1,2,3-cd)pyrene	0.1-1.0
108-88-3	TOLUENE	0.1-1.0
71-43-2	Benzene	0.1-1.0
108-95-2	Phenol	0.1-1.0

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Aromatic hydrocarbons, polycyclic (130489-29-2).

Section 4 - FIRST AID MEASURES

Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Skin

Take off immediately all contaminated clothing. Wash all affected skin areas with warm soapy water. Skin contact causes photosensitization which can last for 36-72 hours after exposure. Keep out of direct sunlight for the next two

to three days to avoid sunburn to the photosensitized skin areas. Use a broad spectrum blockout cream to protect against UV alpha ray exposure. Get medical attention, if needed.

Eyes
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Then get immediate medical attention.

Ingestion
Not a likely route of exposure. Rinse mouth. Do NOT induce vomiting. If a large amount is swallowed, get medical attention. Do not give anything by mouth to unconscious or convulsive person. If vomiting occurs, keep head lower than hips to help prevent aspiration.

Most Important Symptoms/Effects
Acute
Harmful in contact with skin, toxic if inhaled, skin irritation, eye irritation, thermal burns from heated material, allergic reactions, blood damage, respiratory system damage, kidney damage, nervous system damage, heart damage, eye damage

Delayed
allergic reactions, mutagenic effects, Reproductive Effects, blood damage, eye damage, respiratory system damage, central nervous system damage, lung cancer, bladder cancer, skin cancer, scrotal cancer

Indication of any immediate medical attention and special treatment needed
Treat symptomatically and supportively.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media
Suitable Extinguishing Media
regular dry chemical, carbon dioxide, regular foam, water spray, fog or mist

Unsuitable Extinguishing Media
Do not use high-pressure water streams.

Hazardous Combustion Products
oxides of carbon

Advice for firefighters
Contact with heat may generate toxic and/or flammable gases. Containers may rupture or explode if exposed to heat.

Fire Fighting Measures
Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Use extinguishing agents appropriate for surrounding fire. Flood with fine water spray. Directly spraying water or foam onto hot burning product may cause frothing. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire.

Special Protective Equipment and Precautions for Firefighters
Wear full protective firefighting gear including self-contained breathing apparatus (SCBA) for protection against possible exposure.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
Wear personal protective clothing and equipment, see Section 8. Avoid release to the environment.

Methods and Materials for Containment and Cleaning Up

Stop leak if possible without personal risk. To prevent liquid from flowing into drains, completely contain spilled material with dikes, sandbags, etc. Collect spilled material in appropriate container for disposal. In Canada, report releases to provincial authorities, municipal authorities, or both, as required. Due to the concentration of Benzo(b)fluoranthene and the CERCLA (40 CFR 302.4) reportable quantity of 1 pound, the release of 40 pounds (4 gallons) of this product requires National Response Center notification. See Section 13 for waste disposal information.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Do not breathe vapor or mist. Avoid breathing vapors of heated materials. Avoid contact with eyes, skin and clothing. Use only outdoors or in a well-ventilated area. When using, do not eat, drink or smoke. Wear protective gloves/clothing and eye/face protection. Wash exposed areas thoroughly with soap and water, or a waterless hand cleaner, after skin contact and before eating, drinking, using tobacco products, or restrooms. Use protective skin cream on exposed skin before and during work shift. To reduce sun sensitivity a sun-blocking lotion can also be applied prior to application of a protective cream. Contaminated clothing should be removed and laundered before reuse. Contaminated work clothing should not be allowed out of the workplace unless laundered or decontaminated. After working with the product use warm soapy water and a wash cloth to thoroughly wash all areas of skin that have been contacted with product. After washing, apply a broad spectrum UV blockout cream on exposed skin areas before going into sunlight. Keep out of strong sunlight for two to three days after being affected by the product. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.

Conditions for Safe Storage, Including any Incompatibilities

Store in a well-ventilated place.
Keep container tightly closed.
Store locked up.
Store and handle in accordance with all current regulations and standards. Label all containers. Keep in a closed, properly labeled container in a cool (shaded), dry, well-ventilated area. Protect from physical damage. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355 Part B).

Incompatible Materials

oxidizing materials

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Tar, coal, high-temperature	**65996-89-6**
ACGIH:	0.2 mg/m3 TWA as benzene-soluble aerosol (related to Pitch, coal tar, high-temperature)
OSHA (US):	0.2 mg/m3 TWA (benzene soluble fraction) (related to Pitch, coal tar, high-temperature)
Naphthalene	**91-20-3**
ACGIH:	10 ppm TWA
	Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA (US):	10 ppm TWA ; 50 mg/m3 TWA

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 (US):	10 ppm TWA applies to industry segments exempt from the benzene standard at 29 CFR 1910.1028 ; 1 ppm TWA
	5 ppm STEL (See 29 CFR 1910.1028) 15 min ; 0.5 ppm Action Level ; 1 ppm TWA
	5 ppm STEL (see 29 CFR 1910.1028)
	25 ppm Ceiling
Phenol	**108-95-2**
ACGIH:	5 ppm TWA
	Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA (US):	5 ppm TWA ; 19 mg/m3 TWA
	prevent or reduce skin absorption

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)

Tar, coal, high-temperature (65996-89-6)

Medium: urine Time: end of shift at end of workweek Parameter: 1-Hydroxypyrene with hydrolysis (nonquantitative) (related to Pitch, coal tar, high-temperature)

Naphthalene (91-20-3)

Time: end of shift Parameter: 1-Naphthol with hydrolysis plus 2-Naphthol with hydrolysis (nonquantitative, nonspecific)

Benzene (71-43-2)

25 µg/g creatinine Medium: urine Time: end of shift Parameter: S-Phenylmercapturic acid (background); 500 µg/g creatinine Medium: urine Time: end of shift Parameter: t,t-Muconic acid (background)

Phenol (108-95-2)

250 mg/g creatinine Medium: urine Time: end of shift Parameter: Phenol with hydrolysis (background, nonspecific)

Engineering Controls

Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection

ANSI Z87.1-1989 approved safety glasses with side shields. Provide an emergency eye wash fountain and quick drench shower in the immediate work area. At elevated temperatures: A face shield is recommended.

Skin Protection

Wear protective clothing to prevent contact. Wear long sleeved shirt or overalls fastened at wrists and neck, with long legged trousers with trouser legs worn outside over boot tops, boots, socks, and safety hat plus gloves. Use protective skin cream on exposed skin before and during work shift. Protective clothing must be changed when it shows signs of contamination. Remove and launder contaminated clothing separately from other laundry before reuse. When material is at an elevated temperature, wear appropriate heat resistant clothing.

Respiratory Protection
If the applicable TLVs and/or PELs are exceeded, use NIOSH-approved multipurpose air-purifying cartridge respirators, for organic vapors and P-100 particulate.

Glove Recommendations
Wear appropriate chemical resistant gloves. When material is at an elevated temperature, wear appropriate heat resistant gloves.

Protective Materials
protective skin cream, chemical resistant material, heat resistant material

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	black viscous Liquid	**Physical State**	liquid
Odor	aromatic odor	**Color**	black
Odor Threshold	Not available	**pH**	Not applicable
Melting Point	16.6 °F	**Boiling Point**	410 °F
Boiling Point Range	Not available	**Freezing point**	Not available
Evaporation Rate	Not available	**Flammability (solid, gas)**	Not applicable
Autoignition Temperature	Not available	**Flash Point**	>205 °F
Lower Explosive Limit	Not available	**Decomposition temperature**	Not available
Upper Explosive Limit	Not available	**Vapor Pressure**	0.2 - 1 mmHg @ 68 °C
Vapor Density (air=1)	Not available	**Specific Gravity (water=1)**	1.16
Water Solubility	Not available	**Partition coefficient: n-octanol/water**	Not available
Viscosity	>20.5 mm2/s	**Kinematic viscosity**	Not available
Solubility (Other)	Not available	**Density**	Not available
Physical Form	viscous liquid	**Texture**	viscous
Molecular Weight	Not available	**OSHA Flammability Category**	4

Other Information
None known

Section 10 - STABILITY AND REACTIVITY

Reactivity
No reactivity hazard is expected.

Chemical Stability
Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions
Will not polymerize.

Conditions to Avoid
Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials. Containers may rupture or explode if exposed to heat. Keep out of water supplies and sewers.

Incompatible Materials
oxidizing materials

Hazardous decomposition products
oxides of carbon

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation
respiratory system damage, central nervous system damage, eye damage, blood damage, kidney damage, lung cancer, bladder cancer

Skin Contact
irritation, sensitivity to sunlight, allergic reactions, thermal burns from heated material, eye damage, Reproductive Effects, central nervous system damage, blood damage, kidney damage, nervous system damage, skin cancer, scrotal cancer

Eye Contact
irritation, sensitivity to sunlight, thermal burns from heated material, eye damage

Ingestion
thermal burns from heated material, eye damage, central nervous system damage, blood damage, nervous system damage, kidney damage

Acute and Chronic Toxicity

Component Analysis - LD50/LC50
The components of this material have been reviewed in various sources and the following selected endpoints are published:

Tar, coal, high-temperature (65996-89-6)
Oral LD50 Rat 3300 mg/kg (related to Pitch, coal tar, high-temperature)
Dermal LD50 Rat >5000 mg/kg (no deaths occurred) (related to Pitch, coal tar, high-temperature)

Naphthalene (91-20-3)
Oral LD50 Rat 1110 mg/kg
Dermal LD50 Rabbit 1120 mg/kg
Inhalation LC50 Rat >340 mg/m3 1 h

Phenol (108-95-2)
Oral LD50 Rat 340 mg/kg
Dermal LD50 Rabbit 630 mg/kg

Product Toxicity Data

Acute Toxicity Estimate

Dermal	1174.01 mg/kg
Inhalation - Dust and Mist	2.72 mg/L
Oral	>2000 mg/kg

Immediate Effects

Harmful in contact with skin, toxic if inhaled, skin irritation, eye irritation, thermal burns from heated material, allergic reactions, blood damage, respiratory system damage, kidney damage, nervous system damage, heart damage, eye damage.

Delayed Effects
allergic reactions, mutagenic effects, Reproductive Effects, blood damage, eye damage, respiratory system damage, central nervous system damage, lung cancer, bladder cancer, skin cancer, scrotal cancer

Irritation/Corrosivity Data
Erythema/eschar score: very slight

Respiratory Sensitization
No evidence that the material can lead to respiratory hypersensitivity.

Dermal Sensitization
Component data indicate the substance is sensitizing.

Component Carcinogenicity

Tar, coal, high-temperature	**65996-89-6**
ACGIH:	A1 - Confirmed Human Carcinogen (related to Pitch, coal tar, high-temperature)
IARC:	Supplement 7 [1987] (Group 1 (carcinogenic to humans))
NTP:	Known Human Carcinogen (related to Pitch, coal tar, high-temperature)
NIOSH:	potential occupational carcinogen (related to Pitch, coal tar, high-temperature)

May cause cancer. NOAEL: 36 mg/kg bw/day - oral.

Germ Cell Mutagenicity
Bacterial Reverse Mutation Test – positive. May cause genetic defects.

Tumorigenic Data
No data available

Reproductive Toxicity
Available data characterizes this substance as a reproductive hazard. May damage fertility or the unborn child.

Specific Target Organ Toxicity - Single Exposure
blood, respiratory system, kidneys, nervous system, heart, eyes

Specific Target Organ Toxicity - Repeated Exposure
blood, eyes, respiratory system, central nervous system

Aspiration hazard
Not expected to be an aspiration hazard.

Medical Conditions Aggravated by Exposure
respiratory disorders, skin disorders and allergies, eye disorders, central nervous system disorders (i.e. headache, drowsiness, dizziness, loss of coordination) blood system disorders, metabolic disorders, immune system disorders or allergies

Additional Data
Coal tars are listed in the IARC monographs as carcinogenic to humans (Group 1). IARC's evaluation is based on evidence from the first half of the 20th century that occupational exposures to coal-tar derived products are associated with skin cancer in humans. There are also case reports and a few other studies on occupational exposures to coal-tars that are consistent with this evaluation. Epidemiological studies provide evidence that certain exposures

in the coke production industry are carcinogenic to humans, giving rise to lung cancer possibly from coal-tar fume. Also, there is evidence for the carcinogenicity in experimental animals of coal-tars. Today, with the use of engineering controls and personal protective equipment, occupational exposure to coal tar derived components is expected to be below permissible limits (measured as CTPVs). In addition to containing information about the product as a whole, this data sheet also contains information about individual components of the product. Information of this nature may not have been derived from studies or data relating to this product and/or may have been derived from studies or data that did not involve human exposure and involved animal exposure only. Some polycyclic aromatic hydrocarbons (PAHs), found in coal tar complex substances, have been reported to cause lung and skin cancer in humans under conditions of poor personal hygiene, prolonged/repeated contact, and exposure to sunlight. The National Toxicology Program (NTP) and IARC have independently classified various PAH compounds present in coal tar substances as reasonably anticipated to be human carcinogens (NTP), probably carcinogenic to humans (IARC Group 2A), possibly carcinogenic to humans (IARC Group 2B), and not classifiable as to carcinogenicity to humans (IARC Group 3). The cancers reported in the studies upon which IARC based its conclusions involved lung, skin, liver, stomach, kidney and blood cancers in animals. Based on the results of animal experiments PAHs may cause injury to the liver, kidneys, lungs, blood and lymph systems. Some PAH's have also been associated with impaired fertility, heritable genetic damage and birth defects in mice.

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity
Toxic to aquatic life with long lasting effects.

Component Analysis - Aquatic Toxicity

Tar, coal, high-temperature	**65996-89-6**
Fish:	LC50 96 h Oryzias latipes 7.33 - 235 mg/L [semi-static]
Algae:	EC50 72 h Pseudokirchneriella subcapitata 0.015 mg/L IUCLID
Invertebrate:	LC50 48 h Daphnia magna 4.44 - 11.2 mg/L IUCLID

Fish Toxicity
>250 mg/l 96 hour(s) LL50 Brachydanio rerio (Zebra fish)

Invertebrate Toxicity
2.8 mg/l 48 hour(s) EL50 Daphnia magna.

Algal Toxicity
29 mg/l 72 hour(s) EL50 Desmodesmus subspicatus. 5 mg/l 72 hour(s) NOELR.

Persistence and Degradability
Highly insoluble in water.

Bioaccumulative Potential
This material is believed not to bioaccumulate due to low water solubility. Highly insoluble in water.

Mobility
Highly insoluble in water.

Other Toxicity
No data available.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Dispose in accordance with all applicable regulations. Based on the results of the Toxicity Characteristic Leaching Procedure (TCLP): Benzene - D018 (toxicity >/= 0.5 ppm).

Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components.

Section 14 - TRANSPORT INFORMATION

US DOT Information:
Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. , (Contains: BENZO(A)PYRENE , BENZO(B)FLUORANTHENE , NAPHTHALENE) RQ
Hazard Class: 9
UN/NA #: UN3082
Packing Group: III
Required Label(s): 9
Marine pollutant
Further information: For International Shipments: RQ Environmentally hazardous substances, liquid, n.o.s. ID Number UN3082 This material contains reportable quantity (RQ) Hazardous Substances.

IATA Information:
Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. , (Contains: BENZO(A)PYRENE , BENZO(B)FLUORANTHENE , NAPHTHALENE) RQ
Hazard Class: 9
UN#: UN3082
Packing Group: III
Required Label(s): 9
Marine pollutant
Further information: Passenger & Cargo Aircraft - Ltd. Qty. - (Packing Instruction / Max. Net Qty. per Pkg.): Y964 / 30 kg GPassenger & Cargo Aircraft (Packing Instruction / Max. Net Qty. per Pkg.): 964 / 450 L ERG Code: 9L

TDG Information:
Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. , (Contains: BENZO(A)PYRENE , BENZO(B)FLUORANTHENE , NAPHTHALENE) RQ
Hazard Class: 9
UN#: UN3082
Packing Group: III
Required Label(s): 9
Marine pollutant

International Bulk Chemical Code

This material contains one or more of the following chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

Tar, coal, high-temperature	**65996-89-6**
IBC Code:	Category X (molten) (related to Pitch, coal tar, high-temperature)

Further information

STCC Code: 2814137; HAZ STCC Code: 4966312, ERG: 171 US DOT Reportable Quantites BENZO(B)FLUORANTHENE (205-99-2) 1 lbs RQ; 0.454 kg RQ

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

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), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

Tar, coal, high-temperature	**65996-89-6**
TSCA 12b:	Section 4 , 1 % de minimus concentration
Naphthalene	**91-20-3**
SARA 313:	0.1 % de minimis concentration
CERCLA:	100 lb final RQ ; 45.4 kg final RQ
Phenanthrene	**85-01-8**
SARA 313:	1 % de minimis concentration
CERCLA:	5000 lb final RQ ; 2270 kg final RQ
Fluoranthene	**206-44-0**
SARA 313:	1 % Supplier notification limit
CERCLA:	100 lb final RQ ; 45.4 kg final RQ
Anthracene	**120-12-7**
SARA 313:	1 % de minimis concentration
CERCLA:	5000 lb final RQ ; 2270 kg final RQ
Acenaphthene	**83-32-9**
CERCLA:	100 lb final RQ ; 45.4 kg final RQ
Benzo(b)fluoranthene	**205-99-2**
SARA 313:	0.1 % Supplier notification limit
CERCLA:	1 lb final RQ ; 0.454 kg final RQ
Dibenzofuran	**132-64-9**
SARA 313:	1 % de minimis concentration
CERCLA:	100 lb final RQ ; 45.4 kg final RQ
Benzo[a]pyrene	**50-32-8**
SARA 313:	0.1 % Supplier notification limit
CERCLA:	1 lb final RQ ; 0.454 kg final RQ

Benz[a]anthracene	**56-55-3**
SARA 313:	0.1 % Supplier notification limit
CERCLA:	10 lb final RQ ; 4.54 kg final RQ
Benzo(k)fluoranthene	**207-08-9**
SARA 313:	0.1 % Supplier notification limit
CERCLA:	5000 lb final RQ ; 2270 kg final RQ
Chrysene	**218-01-9**
SARA 313:	1 % Supplier notification limit
CERCLA:	100 lb final RQ ; 45.4 kg final RQ
Indeno(1,2,3-cd)pyrene	**193-39-5**
SARA 313:	0.1 % Supplier notification limit
CERCLA:	100 lb final RQ ; 45.4 kg final RQ
TOLUENE	**108-88-3**
SARA 313:	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)
Phenol	**108-95-2**
SARA 302:	500 lb lower TPQ ; 10000 lb upper TPQ
SARA 313:	1 % de minimis concentration
CERCLA:	1000 lb final RQ ; 454 kg final RQ
SARA 304:	1000 lb EPCRA RQ

SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories

Carcinogenicity; Acute toxicity; Reproductive Toxicity; Skin Corrosion/Irritation; Respiratory/Skin Sensitization; Serious Eye Damage/Eye Irritation; Specific Target Organ Toxicity; Germ Cell Mutagenicity

U.S. State Regulations

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

Component	CAS	CA	MA	MN	NJ	PA
Tar, coal, high-temperature	**65996-89-6**	Yes	Yes	Yes	Yes	Yes

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

WARNING

This product can expose you to chemicals including Benzene , which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Canada Regulations

Canadian WHMIS Ingredient Disclosure List (IDL)

Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL

Tar, coal, high-temperature	**65996-89-6**
	0.1 % (related to Pitch, coal tar, high-temperature)
Naphthalene	**91-20-3**
	1 %
Phenanthrene	**85-01-8**
	1 %
Fluoranthene	**206-44-0**
	1 %
Anthracene	**120-12-7**
	1 %
Acenaphthene	**83-32-9**
	1 %
Benzo(b)fluoranthene	**205-99-2**
	0.1 %
Benzo[a]pyrene	**50-32-8**
	0.1 %

Benz[a]anthracene	**56-55-3**
	0.1 %
Chrysene	**218-01-9**
	0.1 %
Indeno(1,2,3-cd)pyrene	**193-39-5**
	0.1 %
TOLUENE	**108-88-3**
	1 %
Benzene	**71-43-2**
	0.1 %

WHMIS Classification
D2A , D2B

Component Analysis - Inventory
Tar, coal, high-temperature (65996-89-6)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No	Yes

The above listed complex substance contains the following constituents (-)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

POLYCYCLIC AROMATIC HYDROCARBONS (Not Available)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Naphthalene (91-20-3)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes

Phenanthrene (85-01-8)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes

Fluoranthene (206-44-0)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	NSL	EIN	Yes	No	Yes	Yes	No	No	No	Yes	Yes	No	Yes	Yes

Anthracene (120-12-7)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes

Acenaphthene (83-32-9)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes

Benzo(b)fluoranthene (205-99-2)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
No	No	EIN	No	No	No	No	No	No	No	No	Yes	No	Yes	Yes

Dibenzofuran (132-64-9)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes

Benzo[a]pyrene (50-32-8)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	No	Yes	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes

Benz[a]anthracene (56-55-3)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	NSL	EIN	No	No	No	No	No	No	No	Yes	Yes	No	Yes	Yes

Benzo(k)fluoranthene (207-08-9)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
No	No	EIN	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes

Chrysene (218-01-9)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	Yes

Indeno(1,2,3-cd)pyrene (193-39-5)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	NSL	EIN	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes

TOLUENE (108-88-3)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

Benzene (71-43-2)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

Phenol (108-95-2)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN (Draft)
Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

U.S. Inventory (TSCA)
Listed on inventory.

Section 16 - OTHER INFORMATION

NFPA Ratings
Health: 2 Fire: 1 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes
Updated: 7/20/2018; SDS SUMMARY OF CHANGES: SECTION 15 - CA Proposition 65

Key / Legend
ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA - California/Massachusetts/Minnesota/New Jersey/Pennsylvania*; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CFR - Code of Federal Regulations (US); CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC – European Commission; EEC - European Economic Community; EIN - European Inventory of (Existing Commercial Chemical Substances); EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; F - Background (for Venezuela Biological Exposure Indices); IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; ISHL - Japan Industrial Safety and Health Law; IUCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol/water partition coefficient; KR KECI Annex 1 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR KECI Annex 2 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL) , KR - Korea; LD50/LC50 - Lethal Dose/ Lethal Concentration; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX – Mexico; Ne- Non-specific; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; Nq - Non-quantitative; NSL – Non-Domestic Substance List (Canada); NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PEL- Permissible Exposure Limit; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; Sc - Semi-quantitative; STEL - Short-term Exposure Limit; TCCA – Korea Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act; TW – Taiwan; TWA - Time Weighted Average; UEL - Upper Explosive Limit; UN/NA - United Nations /North American; US - United States; VLE - Exposure Limit Value (Mexico); VN (Draft) - Vietnam (Draft); WHMIS - Workplace Hazardous Materials Information System (Canada).

Other Information

Disclaimer:
The information set forth in this Safety Data Sheet does not purport to be all-inclusive and should be used only as a guide. While the information and recommendations set forth herein are believed to be accurate, the company makes no warranty regarding such information and recommendations and disclaims all liability from reliance thereon.

Appendix 2

Yard Hydrant Study (Goldman Copeland, April 12, 2018)

Hunts Point Cooperative Market, Inc.

Yard Hydrant Study

Prepared for:

Hunts Point Cooperative Market, Inc
355 Food Center Drive
Bronx, NY 10474

Prepared by:

229 West 36th Street, 7th Floor
New York, NY 10018

212.868.4660 Tel
212.868.4680 Fax

GCA Project No. 18066.00

April 12, 2018

Table of Contents

Appendices

Introduction

Hunt's Point Cooperative Market, Inc. is located on 455 Food Center Drive, Bronx, NY. The Coop is comprised of companies that process and distribute food for the New York City Metropolitan Area, all within a 60 acre facility. Goldman Copeland has been asked to review the conditions of the facility's existing fire service system specifically the fire service mains and fire hydrants The study will determine the need to update systems insuring that they are reliable and robust for the next decades.

Basis for the Study

Goldman Copeland Associates, P.C. conducted one survey of the site, interviewed operating personnel and reviewed existing MEP plans.

Executive Summary

The recommended design criteria are listed below with estimated installation cost for each

Existing yard hydrants shall be replaced along with new curb valves. New valve boxes and foundation support shall be provided to prevent settling and being paved over. New concrete bollards shall be provided to protect yard hydrants from vehicular damage.

1. Budget Estimate

Fire Hydrants & Bollards	$350,000

Description of Existing Systems

Incoming Fire Service and Yard Hydrants

The facility is fed from two 8" fire services each equipped with bypass meter backflow devices accessible through a buried vault. Fire services tap off from the common 20" cold water street main below Food Center Drive. One service is located approximately 225'-0" south of Building F and 350'-0" feet east of Building C. The second 8" service is approximately 90'-0" east of Building E. Similar to the vaults of the domestic services, they are also equipped with sump pumps to discharge any ground water infiltration. There also

exists a total of twenty seven dry barrel type yard hydrants spaced throughout the facility. The condition of the hydrants are discussed in the recommendations section.

Discussion and Recommendations

Yard Hydrants

The conditions of yard hydrants vary on site. Some hydrants are missing nozzle caps while others show visible damage to nearby bollards. Locations of damaged and missing hydrants are shown on the site plan attached in the Appendix. Goldman Copeland recommends providing additional protection by use of bollards for hydrants that are susceptible to be damage by vehicular traffic. Additional signage that warns truck drivers of hydrant locations may also be utilized. All damaged and/or missing hydrants should be replaced with New York City standard dry barrel yard hydrants.

Finally, it has also come to our attention that many of the existing curb valves serving individual hydrants have either been paved over and/or are leaking. Goldman Copeland recommends replacing these curb valves, and repaving the areas to provide required access.

Section 2: Design Criteria and Outline Specifications

Division 21– Fire Suppression

1. General

    a. All systems shall be complete with all necessary hangers, sleeves, accessories and testing in order that a complete functionally perfect plant will be available to the owner.

    b. Provide all items necessary to obtain approval of the authorities having jurisdiction.

2. Codes

    a. The systems shall be in accordance with the regulations of the City of New York, Fire Code, Local Code Officials, Department of Environmental Protection Bureau of Water and Sewer Operations (DEP-BWSO) and Federal guidelines.

3. Facility Fire Suppression Water service piping

   a. Underground water-service piping shall be ductile-iron, mechanical joint pipe; ductile-iron, mechanical-joint fittings; and mechanical joints in accordance with NYC DEP's RCNY Title 15 Chapter 20.

   b. ANSI/AWWA C151/A21.51, Class 56, Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.

4. Valves

   a. Curb Valves shall be full port ball valves or non-rising stem gate valves designed for a minimum of 150 psi of working pressure. Curb valves shall be provided with a tar coated iron extension box with cover which is flush with sidewalk. Curb valve shall be equipped with an operating nut at least one and one quarter (1-1/4") inch square.

5. Fire Hydrants

   a. Contractor must acquire the following water main work material specifications (latest revisions) from the Department of Environmental Protection, Bureau of Water and Sewer Operations, Office of the Chief of Water Main Failure Analysis, 59-17 Junction Boulevard, 3rd floor- Low Riser, Flushing, NY 11373: Section 2.08 Standard specification for Dry Barrel Fire Hydrants and Extension Kits.

   b. All new hydrants shall be two-piece "Breakaway" hydrants, Type S-2LP or D-2-L, as shown on the latest revisions of BWSO Standard Drawing Nos. 43250-Z or 43142-Z.


BFP-3 VAULT (8" FIRE SERVICE)
BFP-3 VAULT (8" FIRE SERVICE)
FH-24 REMOVED FROM GROUND
FH-25 REMOVED FROM GROUND
FH-23 REMOVED FROM GROUND
FH-12 REMOVED FROM GROUND
FH-1
FH-2
FH-3
FH-4
FH-5
FH-6
FH-8
FH-9
FH-10
FH-13
FH-15
FH-16
FH-17
FH-18
FH-19
FH-20
FH-21
FH-22
FH-26
FH-27
COLD STORAGE WAREHOUSE BUILDING E
fl. elev. 15.5
MARKET BLDG. F
UTILITY BUILDING D
fl. elev. 14.0
MARKET BUILDING A
fl. elev. 17.87
MARKET BUILDING B
fl. elev. 17.67
MARKET BUILDING C
fl. elev. 17.67
SITE SYMBOL LIST
PROPOSED GAS LOADS - INPUT
REFERENCE LIST
NOTES
KEY PLAN
NO SCALE
HUNTS POINT COOPERATIVE MARKET
HUNTS POINT COOPERATIVE MARKET INC.
HUNTS POINT FOOD CENTER BRONX NEW YORK
BRAND & MOORE
SITE PLAN
P-1

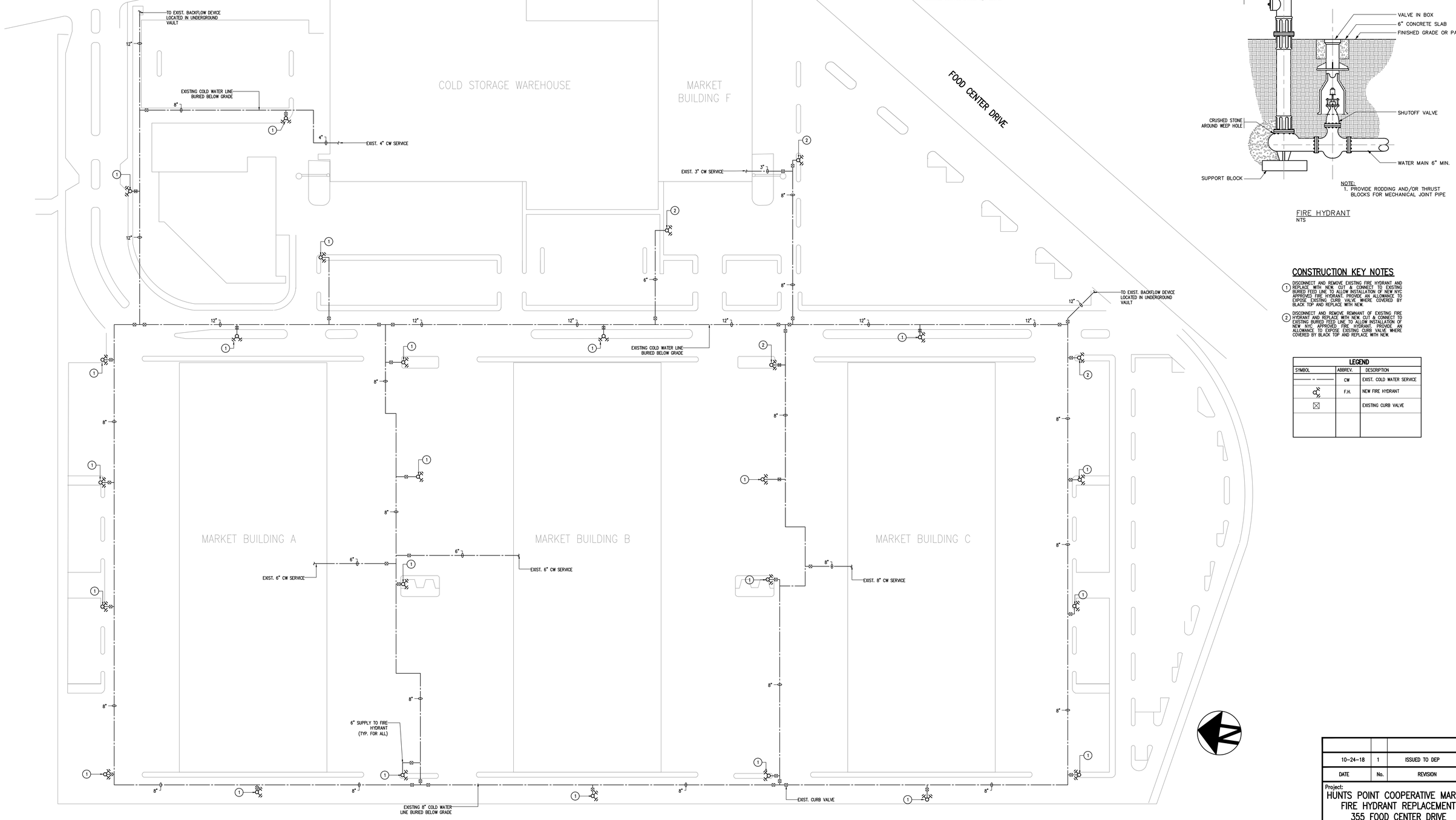
Appendix 3

Drawing C-100.0: Site Plan Notes, Legend, and Details

(Goldman Copeland, October 24, 2018)

NOTES:

1. THE CONTRACTOR SHALL CHECK AND VERIFY PROPOSED AND EXISTING GRADES, DIMENSIONS AND EXISTING CONDITIONS AND REPORT AND DISCREPANCIES TO THE ENGINEER FOR THEIR DISCRETION BEFORE PROCEEDING WITH THE WORK.
2. THESE CONTRACT DOCUMENTS MAKE NO REPRESENTATION AS TO THE MEANS AND METHODS OF CONSTRUCTIONS.
3. CONTRACTOR IS TO PROTECT EXISTING SITE FEATURES SPECIFICALLY CALLED OUT TO REMAIN AT NO ADDITIONAL COST TO THE OWNER REGARDLESS OF UNFORSEEN CONDITIONS. THIS INCLUDES EXISTING CHAIN LINK FENCING, FENCE POSTS, GATES, WALLS AND ASSOCIATED FOUNDATIONS.
4. CONTRACTOR TO DEMOLISH AND REMOVE ELEMENTS WITHIN THE PROPERTY LINE NOT SPECIFICALLY CALLED OUT TO REMAIN AT NO ADDITIONAL COST TO THE OWNER REGARDLESS OF UNFORSEEN CONDITIONS.
5. CONTRACTOR IS TO EXCAVATE OR OVER-EXCAVATE TO REMOVE UNSUITABLE MATERIALS AS REQUIRED TO PROVIDE ALL PROPOSED ELEMENTS IN THE CONSTRUCTION DOCUMENTS AT NO ADDITIONAL COST TO THE OWNER.
6. THE CONSTRUCTION MANAGER SHALL PHOTOGRAPHICALLY DOCUMENT MATERIALS REMOVED, AND ESTIMATE QUANTITIES BY VOLUME, PROVIDING THIS DOCUMENTATION TO THE OWNER AT EACH CONSTRUCTION MEETING, WITH NO MORE THAN TWO-WEEK LAG TIME.
7. BASE SURVEY INFORMATION WAS SUPPLIED BY OWNER. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED IMPROVEMENTS ACCORDING TO THE LAYOUT AND MATERIAL DESIGN AS NECESSARY TO COMPLETE THE PLANS AND SPECIFICATIONS TO PROVIDE POSITIVE DRAINAGE IN THE DIRECTION OF A DRAINAGE COURSE OR STRUCTURE.
8. CONTACT UTILITY COMPANIES AS REQUIRED BY STATE AND LOCAL REGULATIONS BEFORE DIGGING TO LOCATE AND MARK EXISTING UTILITIES.
9. MAINTAIN ALL EXISTING GRADES WHEN RESURFACING EXCEPT WHERE NOTED TO PITCH NEW PAVEMENT AND LAWN IN THE DIRECTION OF AREA DRAINS AND IN NO CASE SHALL THE RESTORED SURFACE EXCEED 2% SLOPE.
10. MEET ELEVATIONS OF EXISTING SURFACES FLUSH.
11. COORDINATE ALL UTILITY WORK WITH THE LOCATIONS AND FINAL GRADES OF ALL OTHER WORK. WHERE CONFLICTS OCCUR, NOTIFY THE ARCHITECT PRIOR TO INSTALLATION OF UTILITIES TO MAKE ADJUSTMENTS AS REQUIRED. IF NEW UTILITIES HAVE BEEN INSTALLED IN CONFLICT WITH CURBS, WALLS, PAVING OR OTHER STRUCTURES AT DEPTHS TOO SHALLOW FOR PROPER COVER BENEATH NEW GRADES OR INCORRECT FINISH GRADE, THEY SHALL BE ADJUSTED OR REMOVED AND REPLACED AS NECESSARY WITHOUT EXTRA COMPENSATION.
12. ALL EROSION & SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF ANY SITE DISTURBANCE ACTIVITIES & MAINTAINED IN FUNCTIONAL ORDER THROUGHOUT THE DURATION OF CONSTRUCTION.
13. PROTECT EXISTING SITE FEATURES DESIGNATED TO REMAIN AS PART OF THE WORK.
14. PROMPTLY NOTIFY THE OWNER'S REPRESENTATIVE OF UNEXPECTED SUB-SURFACE CONDITIONS.
15. PROTECT BOTTOMS OF EXCAVATIONS AND SOIL BENEATH AND AROUND FOUNDATION FROM FROST AND FREEZING. GRADE AT EXCAVATIONS TO PREVENT SURFACE WATER DRAINING INTO EXCAVATED AREAS.
16. DO NOT STOCKPILE TOPSOIL MORE THAN FOUR FEET HIGH.



NOTE:
1. PROVIDE RODDING AND/OR THRUST BLOCKS FOR MECHANICAL JOINT PIPE

FIRE HYDRANT
NTS

CONSTRUCTION KEY NOTES

(1) DISCONNECT AND REMOVE EXISTING FIRE HYDRANT AND REPLACE WITH NEW. CUT & CONNECT TO EXISTING BURIED FEED LINE TO ALLOW INSTALLATION OF NEW NYC APPROVED FIRE HYDRANT. PROVIDE AN ALLOWANCE TO EXPOSE EXISTING CURB VALVE WHERE COVERED BY BLACK TOP AND REPLACE WITH NEW.

(2) DISCONNECT AND REMOVE REMNANT OF EXISTING FIRE HYDRANT AND REPLACE WITH NEW. CUT & CONNECT TO EXISTING BURIED FEED LINE TO ALLOW INSTALLATION OF NEW NYC APPROVED FIRE HYDRANT. PROVIDE AN ALLOWANCE TO EXPOSE EXISTING CURB VALVE WHERE COVERED BY BLACK TOP AND REPLACE WITH NEW.

LEGEND		
SYMBOL	ABBREV.	DESCRIPTION
——— CW ———	CW	EXIST. COLD WATER SERVICE
	F.H.	NEW FIRE HYDRANT
⊠		EXISTING CURB VALVE

THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

Professional Seal

10-24-18	1	ISSUED TO DEP
DATE	No.	REVISION

Project:
HUNTS POINT COOPERATIVE MARKET
FIRE HYDRANT REPLACEMENT
355 FOOD CENTER DRIVE
BRONX NY 10474

Title:
SITE PLAN
NOTES, LEGEND, & DETAILS

GOLDMAN COPELAND Consulting Engineers
229 West 36th Street
New York, NY 10018
V: 212.868.4660
F: 212.868.4680

PROJ. No.	–
SCALE:	AS SHOWN
DESIGNED BY:	A.L.
CHECKED BY:	D.C.
DATE:	–

C-100.00
SHT OF

Appendix 4

Disposal Facility Acceptance Criteria and Permits

1. Clean Earth of Southeast Pennsylvania (Morrisville)

Clean Earth Sampling Protocol
Southeast PA (Morrisville)

PARAMETERS	TPH	TOX	RCRA 8 - TOTAL METALS + Copper, Nickel & Zinc	TCLP METALS RCRA	IGNITABILITY	CORROSIVITY (PH)	REACTIVITY - SULFIDE AND CYANIDE	PCBs	TCLP VOLATILE ORGANICS Non Virgin Sources	TCLP VOLATILE ORGANICS Run for Non Virgin Sources	TCLP SEMI VOLATILE ORGANICS Run for Non Virgin Sources
METHODS (1)		8015M	9023	6000/7000	1311/6010	1030	9045D	SW846 CHAPTER 7.3	8082A	1311/8260B	1311/8270D
	FREQUENCY										
LIGHT END HYDROCARBONS	Grab - 1st 90 tons; 2nd 90 tons; every 180 tons thereafter	**X**	**X**								
	Grab - Every 900 tons									**X**	
	5 point grab composite 1st 900 tons and every 900 tons thereafter			**X**	**X**	**X**	**X**	**X**	**X**		**X**
Limit		*<45,000		End Use Criteria	Below RCRA Toxicity Level	Negative	>2 - <12.5	Sulfide <500 Cyanide <250	<4	Below RCRA Toxicity Level	Below RCRA Toxicity Level
HEAVY END HYDROCARBONS	Grab - 1st 90 tons; 2nd 90 tons; every 375 tons thereafter	**X**	**X**								
	Grab - Every 1500 tons									**X**	
	5 point grab composite 1st 1500 tons and every 1500 tons thereafter			**X**	**X**	**X**	**X**	**X**	**X**		**X**
Limit		*<45,000		End Use Criteria	Below RCRA Toxicity Level	Negative	>2 - <12.5	Sulfide <500 Cyanide <250	<4	Below RCRA Toxicity Level	Below RCRA Toxicity Level

* If TPH is >10,000 ppm a PADEP Form U must be submitted
(1) The methods provided are standard EPA methods. The method revisions are subject to change and the most current method should always be utilized by the laboratory.

This is to be used as a guideline for sampling. Sampling frequencies and parameter requirements may be modified at the discretion of the CE Approval staff based items such as site history, levels of contamination and/or source of contamination, etc.

Clean Earth of Southeast Pennsylvania Facility
Analytical Requirements Summary

Clean Earth of Southeastern Pennsylvania (CESP)

Acceptable Waste Materials include non-hazardous impacted soils and aggregates as well as other non combustible granular materials, which are impacted by:

- Virgin and non-virgin petroleum hydrocarbons, including: Light-end hydrocarbons (gasoline, jet fuel, kerosene, diesel fuel, No. 2,3 or 4 fuel oil) and Heavy-end hydrocarbons (No. 5 or 6 fuel oil, crude oil, tars (asphalt, petroleum, coal) lubricating oil

- Oxygenated hydrocarbons: alcohols, ethers, organic acids and ethylene glycol.

Thermal processing throughput: 80 Tons/Hour
Operating Hours: 24 hours/day, 7 days/wk, 4,100 hours/year
Receiving Hours: 0600 to 1800 Monday through Saturday. Deliveries must be scheduled.
Waste Analysis must be performed by a PA registered laboratory.

Waste Analysis and Classification Plan Evaluation: Waste Characterization (Pre-Approval)				
Group 1 – Light End Hydrocarbons				
Frequency	Sample Type	Analysis	Method	Limit (mg/kg)
First 90 Tons	Grab	TPH TOX	418.1(1) SW-846 9020B	≤45,000 (>10,000(2)) ≤1,000
Second 90 Tons	Grab	TPH TOX	418.1(1) SW-846 9020B	≤45,000 (>10,000(2)) ≤1,000
Every 180 Tons Thereafter	Grab	TPH TOX	418.1(1) SW-846 9020B	≤45,000 (>10,000(2)) ≤1,000
First 900 Tons (and every 900 tons thereafter)	Representative Composite	Total Metals(3) TCLP Metals(4) PCB IC and R(5) TCLP Organics(6)	SW-846 3050/6010B SW-846 1311/6010B SW-848 8082 SW-848 1030, 1110, Chapter 7 and RAM SW-846 1310/8260	Form R Table 1 TCLP Limits < 4.0 mg/Kg <RCRA Limits & 10 µR/Hr (at facility) TCLP Limits

Group 2 – Heavy End Hydrocarbons				
Frequency	Sample Type	Analysis	Method	Limit [mg/kg]
First 90 Tons	Grab	TPH TOX	418.1(1) SW-846 9020B	≤45,000 (>10,000(2)) ≤1,000
Second 90 Tons	Grab	TPH TOX	418.1(1) SW-846 9020B	≤45,000 (>10,000(2)) ≤1,000
Every 375 Tons Thereafter	Grab	TPH TOX	418.1(1) SW-846 9020B	≤45,000 (.10,000(2)) ≤1,000
First 1500 Tons (and Every 1500 tons thereafter)	Representative Composite	Total Metals(3) TCLP Metals(4) PCB IC and R(5) TCLP Organics(6)	SW-846 3050/6010B SW-846 1311/6010B SW-848 8082 SW-848 1030, 1110, Chapter 7 and RAM Sw-846 1310/8206	Form R Table 1 TCLP Limits < 4.0 mg/Kg < RCRA Limits & 10 µR/Hr (at facility) TCLP Limits

(1) Or use method API-GC-FID or equivalent (8015 GRO or DRO)
(2) Contaminant concentrations >10,000 mg/kg requires PADEP Form U approval
(3) Includes As, Ba, Cd, Cr6+, Cu, Hg, Ni, Pb, Se, Ag, Zn
(4) TCLP analysis is required when total metal concentrations are twenty (20) times the RCRA Limit [40 CFR 281 Subpart C]
(5) ICR= Ignitability, Corrosivity, and Reactivity [40 CFR 281 Subpart C]
(6) TCLP RCRA organics testing required when contaminant is not the result of a virgin fuel spill or tank pull. TCLP Volatile Organics must be on a grab sample, and TCLP Semi-Volatile must be on a composite sample.

Metals:	Totals (mg/kg)	Metals:	Totals (mg/kg)
Arsenic	53	Lead	450
Barium	8,200	Mercury	10
Cadmium	38	Nickel	650
*Chromium VI	190	Selenium	26
Copper	8,200	Silver	84
		Zinc	12,000

*Cr+6 n/a if total chromium less than 190 ppm.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

July 19, 2017

Ms. Cheryl L. Coffee
Clean Earth of Southeast Pennsylvania, LLC
7 Steel Road
Morrisville, PA 19067

Re: Permit Renewal
Clean Earth of Southeast Pennsylvania, LLC
Falls Township
Bucks County
Permit Application No. 301254
APS No. 755912, AUTH No. 1134411

Dear Ms. Coffee:

The Pennsylvania Department of Environmental Protection (DEP) has reviewed your permit application received on April 22, 2016, for a ten (10) year permit renewal to continue operation of the Clean Earth of Southeast Pennsylvania (CESP) facility, a residual waste processing facility located at 7 Steel Road in Falls Township, Bucks County. We have determined that you have satisfied all applicable requirements necessary to perform these activities. Therefore, we have issued the enclosed permit in accordance with Article V of the Solid Waste Management Act, 35 P.S. Sections 6018.101 et seq.

Compliance with the limitations and stipulations that have been set forth on your permit is mandatory.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717.787.3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800.654.5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717.787.3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

IMPORTANT LEGAL RIGHTS ARE AT STAKE, HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717.787.3483) FOR MORE INFORMATION.

If you have any questions about the enclosed permit or requirements of the Solid Waste Management Act, please contact Dr. Mohamad Mazid, P.E., Chief, Technical Services, by email at mmazid@pa.gov or by telephone at 484.250.5768.

Thank you for your cooperation.

Sincerely,

James Wentzel, P.E.
Regional Manager
Waste Management

Enclosure: Permit Renewal

cc: Mr. Gray - Falls Township (w/enclosure)
Ms. Kostick - Bucks County Health Department (w/enclosure)
Mr. Logan - Compliance Plus Services, Inc. (w/enclosure)
Re 30 (rc17wm) 200.2

bcc: Dr. Mazid (w/enclosure)
Mr. Mountain, AQ (w/enclosure)
Mr. Bower (w/enclosure)
Mr. A. Patel (w/enclosure)
Ms. Akinlotan (w/enclosure)
Mr. Wentzel (w/enclosure)
Permit File Drawer (w/enclosure)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2017

Under the provisions of the Pennsylvania Solid Waste Management Act of July 7, 1980, Act 97, a permit for a solid waste disposal and/or processing facility at (municipality) Falls Township in the County of Bucks is granted to

(applicant) Clean Earth of Southeast Pennsylvania, LLC

(address) 7 Steel Road East

Morrisville, PA 19067

This permit is applicable to the facility named as Clean Earth of Southeast Pennsylvania, LLC and described as: a residual waste processing facility

Latitude - 40°, 10', 45"

Longitude - 74°, 45', 55"

This permit is subject to modification, amendment, and supplement by the Department of Environmental Protection (DEP) and is further subject to revocation or suspension by DEP for any violation of the applicable laws or the rules and regulations adopted thereunder, for failure to comply in whole or in part with the conditions of this permit and the provisions set forth in the application No. 301254 which is made a part hereof, or for causing any condition inimical to the public health, safety, or welfare.

See Attachment for waste limitations and/or Special Conditions.

FOR THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

THIS PERMIT IS NON - TRANSFERABLE

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

1. This Waste Management Permit is renewed based upon application No. 301254 (APS No. 755912, AUTH No. 1134411), which was received at the Southeast Regional Office of the Pennsylvania Department of Environmental Protection (DEP) on April 22, 2016 for the ten-year renewal application to continue operations for the processing and thermal treatment of contaminated soil at the Clean Earth of Southeast Pennsylvania (CESP) facility, a residual waste processing facility located at 7 Steel Road, Morrisville, PA 19067 in Falls Township, Bucks County.

   This approved application consists of the following documents (unless otherwise noted, received and revised refer to the dates documents were received by DEP and not necessarily the dates of the documents themselves):

   Form A received on April 22, 2016
   Form B received on April 22, 2016
   Form B1 received on April 22, 2016
   Form HW-C received on April 22, 2016
   Form D received on April 22, 2016
   Form E received on April 22, 2016, and revised on February 10, 2017
   Form G(A) received on February 10, 2017
   Form I received on April 22, 2016, and revised on February 10, 2017
   Form L and the PPC Plan received on April 22, 2016, revised on February 10, 2017, and April 24, 2017
   Form P received on April 22, 2016, and revised on June 19, 2017
   Form R received on April 22, 2016
   Form X received on April 22, 2016
   Form 5R received on April 22, 2016
   Bonding Worksheet received on April 22, 2016, revised on November 28, 2016, February 10, 2017, and April 24, 2017
   Figure 1, titled "Soil Drying Agent Storage Locations" dated November 1, 2010 received on February 10, 017
   Drawing D-001, titled "Site Plan," dated October 30, 2006, received on February10, 2017
   Drawing GU-01, titled "Grading & Utility Plan" dated December 13, 2016, received on February 10, 2017 and revised on April 3, 2017, received on April 24, 2017

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

Drawing SL-01, titled "Site Layout Plan" dated December 16, 2016, received on February 10, 2017, and revised on April 3, 2017, received on April 24, 2017, and again revised on May 4, 2017, and received on June 19, 2017
Drawing SL-02, titled "Sections & Details" dated April 3, 2017, received on April 24, 2017, and revised on May 4, 2017, received on June 19, 2017

This approved application also includes the documents received on May 12, 2016, February 10, 2017, April 24, 2017, and June 19, 2017, in response to DEP's review comments sent on April 29, 2016, October 21, 2016, March 15, 2017, via email, and April 27, 2017, via email, respectively.

2. Nothing in this permit shall be construed to supersede, amend, or authorize violation of, the provisions of any valid and applicable local law, ordinance, or regulation, provided that said local law, ordinance, or regulation is not pre-empted by the Pennsylvania Solid Waste Management Act, the Act of July 7, 1980, Act 97, 35 P.S. 6018.101 et seq.

3. As a condition of this permit, and of the permittee's authority to conduct the activities authorized by this permit, the permittee, hereby, authorizes and consents to allow authorized employees or agents of the DEP, without advanced notice or a search warrant, upon presentation of appropriate credentials, and without delay, to have access to and to inspect all areas on which solid waste management activities are being or will be conducted. The authorization and consent shall include consent to collect samples of waste, water or gases, to take photographs, to perform measurements, surveys, and other tests, to inspect any monitoring equipment, to inspect the methods of operation, and to inspect and/or copy documents, books, or papers required by the DEP to be maintained. This permit condition is referenced in accordance with Sections 608 and 610(7) of the Solid Waste Management Act, 35 P.S. Sections 6018.608 and 6018.610(7). This condition in no way limits any other powers granted under the Solid Waste Management Act.

4. a. This facility may not accept residual waste unless DEP has specifically approved the processing and management of the waste as a part of this permit.

b. Hazardous waste may not be stored, processed, or disposed at the facility.

c. Municipal waste, including construction/demolition waste and sewage sludge, may not be stored, processed, or disposed at the facility.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

d. Other special handling wastes may not be stored, processed, or disposed at the facility unless DEP has specifically approved the processing and management of the waste as a part of the permit.

e. Sewage sludge that has been processed pursuant to a General Permit issued by the DEP's Bureau of Safe Drinking Water and Wastewater Management pursuant to 25 Pa. Code Chapter 271, Subchapter J, and that meets a Class A or Class B pathogen requirement (i.e., biosolids) may be accepted and further processed at this facility provided that said acceptance and processing is also conducted pursuant to a Bureau of Waste Management General Permit issued pursuant to 25 Pa. Code Chapter 271, Subchapter I, or Chapter 287, Subchapter H, subject to any additional limitations or restrictions as may be contained in this permit. The permittee shall submit to the Southeast Regional Office, Waste Management, an analysis of the terms and conditions of any such General Permit that may be issued along with an evaluation of the impact of the General Permit on the terms and conditions of this individual permit.
The DEO will review this analysis to determine if this permit requires revision or modification to adequately incorporate the processing and beneficial use requirements of the General Permit. The Permittee shall not conduct processing or beneficial use operations under the General Permit until or unless written approval is obtained from the DEP's review pursuant to this subcondition.

f. No waste with free petroleum product or other liquids, as determined by USEPA SW-846, Method 9095, shall be accepted at the facility.

g. Pursuant to Form P, Attachment A, Material Profile Sheet, Section C, the facility shall check the incoming waste for any chemical compound that is used to suppress the odor of the waste or to make it drier, and shall also check for any chemical compound that is not included in the manifest for the incoming waste.

5. The permitted days and hours for acceptance of waste are Monday through Saturday from 6 a.m. to 6 p.m. The facility's permitted days and hours of on-site operations are 24 hours per day, seven days per week. Waste acceptance and/or operations may be extended due to extreme weather conditions in accordance with the following procedure. Prior to extending operations, justification for such an extension must be mailed or faxed to the Waste Management Manager or his designee. Written concurrence that the extension is justifiable needs to be received by the permittee from the manager, or

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

his designee, before extended operations may be implemented. All other requests to extend operating hours must be requested in advance of need and be approved, in writing, in advance by DEP.

6. The maximum amount of solid waste (including any sewage sludge/biosolids accepted pursuant to Condition 4, above) that may be accepted for processing shall not exceed 2,400 tons per day (tpd). Clean fill, as that material is defined by the DEP's Management of Fill policy (Document No. 258-2182-773), shall only be managed at the facility pursuant to Section 2.5 of Form P and the amounts of clean fill received at the facility each day shall be counted against the facility's 2,400 tpd daily volume limitation until or unless a revised traffic impact study is submitted to and approved by the DEP to address additional traffic associated with clean fill operations. Other than being counted towards the facility's daily volume limitation as described above and being included in the facility's recordkeeping requirements described in Conditions 8 and 9 of this permit, clean fill is not otherwise subject to regulation pursuant to this permit unless its management at the facility creates or contributes to on- or off-site nuisances.

7. The operator shall inspect each load in accordance with its approved plan under 25 Pa. Code Section 287.134 of the Residual Waste Regulations, to ensure compliance with that section and Section 297.201.

8. All analyses (including, but not limited to, pre-approval, pre-acceptance, and post treatment) of solid waste that is accepted at the facility and all documentation regarding environmental due diligence determinations for clean fill managed at the facility shall be maintained by the operator on-site for a minimum of 5 years after the analyses/determinations are performed, unless the permittee's application specifies a longer retention time frame. These records must be made available to representatives of the DEP upon request.

9. Daily operational records must be kept in a format outlined in Section 297.261 of the Residual Waste Rules and Regulations. This must include the type and amount of material (solid waste, clean fill) accepted each day, the source or generator of the material, the amount of material processed each day, the type and amount of material added to the processed material storage pile each day, the type and amount of material (solid waste and clean fill) transported off-site each day, and the use and destination of the material that is transported off-site each day.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

10. An annual operations report is to be submitted on or before June 30 of each year to the DEP's Southeast Regional Office in accordance with the format outlined in Section 297.262 of the Residual Waste Rules and Regulations. This must be accompanied by the annual permit administration fee.

11. The facility is permitted to accept and to process by physical means (screening, mixing, or blending) and/or by thermal remediation the following contaminated materials: naturally-occurring soils and aggregates composed of clay, silt, sand, natural organic matter, gravel, rock, and stone that are removed from the ground after becoming contaminated to nonhazardous levels by hydrocarbon contaminants. For the purposes of this permit, hydrocarbon contaminants shall consist of virgin and nonvirgin petroleum hydrocarbons (gasoline; jet fuel; kerosene; diesel fuel; No. 2-6 fuel oil; asphalt; petroleum and coal tars; greases; crude oil; heating oil; and lubricating oil) and oxygenated hydrocarbons (alcohols, ethers, organic acids, and ethylene glycol). The descriptions and listings contained herein are intended to be limiting. When used in this permit, the terms "contaminated material," "contaminated materials," "hydrocarbon contaminant," and "hydrocarbon contaminants" shall be restricted to the descriptions and listings contained above. For contaminated materials or hydrocarbon contaminants that are not specifically described above, the permittee must submit a Form U disposal request for DEP review and approval prior to acceptance and processing, and might be required to submit a permit modification if the request is deemed to be for a type of waste not approved in this permit.

12. a. Incoming contaminated material that is being sampled as part of the on-site waste acceptance and screening process shall be staged in the truck at the designated staging area (identified as the staging area for detected RAM loads) while awaiting review and acceptance of analytical results prior to being placed inside the contaminated material storage building (building). Incoming contaminated material that is not being sampled shall be visually inspected for compliance with the requirements of Form R, Section 3.2 prior to being placed inside the building. Incoming contaminated material from a particular job or from a particular job that is received during the operating day (in cases material receipt for a job extends beyond a single day) shall be segregated from other materials when initially placed inside the building until all on-site waste acceptance screening samples collected for that job, or for the batch of material received from that job during the operating day, have been analyzed and found acceptable. Should any screening sample collected for that job, or for the batch of material received from that job during the operating day, fail to meet acceptance criteria for any parameter analyzed, the segregated material shall be rejected (returned to the generator or sent to an acceptable processing or disposal facility) or else the entire quantity of segregated material shall be resampled by

collecting and analyzing samples that are representative of the entire quantity of segregated material in the number specified by Condition 15 for that quantity of material. If the resampling demonstrates compliance with the facility's waste acceptance criteria, then the material may remain at the facility for processing. If the resampling indicates that all or a portion of the material does not meet waste acceptance criteria, then all or that portion of the material that is unacceptable shall be rejected. No blending of the material with other material inside the building shall occur until this procedure has been satisfied.

b. Incoming contaminated material shall be staged or stored in Areas 1 to 6, as indicated on Drawing No. SL-01, except that nonrecyclable oversized material may also be stored in Area 7 pursuant to Condition 19. Each storage area measures 28' wide by 130' deep as measured from the back wall of the building. All contaminated material must be stored inside the building and said storage shall be limited to the footprint defined by these six areas (168' wide by 130' deep), thereby maintaining a 20' clear zone between the edge of the permitted storage area and the front wall (overhead door side) of the building for unimpeded vehicle and equipment movement inside the building. Pile height must not be higher than the roof frame and shall be sufficiently below the roof frame to allow equipment to maneuver on and within the pile(s) without the possibility of the equipment damaging the roof or its supporting structure.

c. Areas 1 and 2 shall be used for the staging or storage of only regulated fill material or material intended for direct reuse without thermal remediation. In addition to any temporary segregation required pursuant to Condition 12a, above, relating to segregation of material as part of the on-site waste acceptance screening procedures, regulated fill material and direct reuse material staged or stored in Areas 1 and/or 2 at the same time are to be segregated from each other by physical barriers. No mixing or blending of regulated fill material with direct reuse material is allowed at any time. Incoming contaminated material requiring thermal remediation shall be staged or stored only in Areas 3 to 6. However, any or all of Areas 3 to 6 may be used to stage or store regulated fill material and/or direct reuse material provided that:

i. All material intended for thermal remediation is first removed from the area(s) and the area(s) are cleaned to the greatest extent practical.

ii. Regulated fill material and direct reuse material stored in the area(s) shall be physically segregated from each other as specified in Condition 12.c, above.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

iii. The area(s) being used for staging or storage of regulated fill material and/or direct reuse material shall be clearly marked, including visual markings, to prevent the placement of contaminated material intended for thermal remediation in the area(s).

d. Except as may be allowed pursuant to Condition 19, relating to nonrecyclable, oversized material storage, Area 7, as indicated on Drawing No. SL-01, shall be used only for blending and/or physical processing preparation of contaminated material removed from storage from Areas 1 to 6. This use may entail staging of material removed from Areas 1 to 6 prior to, and/or after, blending or physical processing in preparation for being thermally remediated or moved to outside storage in the case of regulated fill or direct reuse materials not requiring thermal remediation. Incoming material shall not be directed to Area 7 for staging or storage. Further, Area 7 shall be used to stage and process either soil intended for thermal remediation or regulated fill/direct reuse materials, but not both at the same time. Regulated fill material and direct reuse material shall be segregated from each other at all times, including contact in processing equipment, when in Area 7. No regulated fill and/or direct reuse material may be in Area 7 at any time when material intended for thermal remediation is present, and vise versa. Area 7, including processing equipment, shall be appropriately decontaminated when switching between the management of regulated fill, direct reuse materials, or materials intended for thermal remediation so that cross-contamination between material types does not occur.

e. At no time may the amount of contaminated material inside the building (Areas 1 through 7 inclusive) exceed 11,667 cubic yards. or 17,500 tons. The permittee shall maintain adequate records of incoming and outgoing materials and material processed to determine the amount of contaminated material contained inside the building at any given time. Said determination must be provided to the DEP upon request and shall be recorded in the facility's operational records on at least a daily basis. In addition, the permittee shall accurately measure the volume of all the contaminated material inside the building at least once per calendar quarter and compare the measured volume determination to the volume determination based on facility recordkeeping. Results of this determination shall be recorded as part of the facility's daily operation record. If the permittee, through its recordkeeping and quarterly measurement comparisons, is unable to document the amount of contaminated material inside the building to the DEP's satisfaction, the permittee shall conduct pile volume measurements or surveys to determine the amount of contaminated material present upon written request from DEP.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

13. Processed sewage sludge (i.e., biosolids) accepted pursuant to Condition 4, above, shall be stored in a 35' by 70' area within Area 7 as indicated on Drawing No. SL-01. No more than 1,000 tons of this material may be store on-site at any time, not counting material that may be contained in processed soil blends stored in the outside processed soil stockpile area. When not used for biosolids storage, the 35' by 70' area may be used for activities approved for Area 7 in Condition 12, above. The permittee shall keep a Biosolids Evaluation and Certification Form, including all supporting documentation, for each generator on file at the facility for a minimum of 5 years.

14. a. Waste characterization shall be conducted in accordance with Section 2 of Form R, relating to types of contaminated wastes, site characterization, waste approval, characterization, and approval for biosolids, and shipment of approved waste material. Each sample required for site characterization (Form R, Section 2.2 and Soil Profile Sheet, Tables B and C) shall be a discrete grab sample when analyzing for total petroleum hydrocarbons (TPH) and total organic halides (TOX) and a composite of at least three discrete and representative grab samples when analyzing for Total Metals, Polychlorinated Biphenyl (PCBs), ignitability, reactivity, and corrosivity, and each sample (grab or composite consisting of three grabs) shall be collected at the frequency specified in Table 1 of Form R, Section 2.3. The acceptance limits contained in Table 1, Form R, Section 2.3 are absolute maximum concentrations. TCLP is required when metals are 20 times the Remedial Action Completion Report (RACR) limits. When a project is not the result of a virgin petroleum fuel spill or tank pull, TCLP for RCRA organics is required.

b. An exception to the maximum total metals waste acceptance limits contained in Table 1 of Section 2.3 of the Form R may be made provided that (1) end use approval has been secured for the soil at the higher metal concentrations, (2) all other procedures pertaining to preacceptance, screening and processing of waste are met, and (3) Section 2.3.2 of the Form R, entitled "Special Acceptance Procedures for Certain Beneficial Reuse" is followed. In addition, a Form U must be submitted in accordance with Condition 16 of this permit for each total metals waste acceptance limitation waiver request along with a cover sheet (Special Acceptance Form) identifying it as soil with metal level exceedances and accompanied by the end use approval or authorization documentation. Waste subject to a Form U waste processing request submitted pursuant to this subcondition (14b) may not be accepted for processing until specifically approved by DEP in writing (i.e., the automatic fifteen calendar day approval period provided by Condition 16f of this permit is not applicable).

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

c. No blending of soils with elevated metal concentrations accepted pursuant to Condition 14.b may be performed to meet any end use criteria metal levels, and the soil shall be kept segregated from other soils unless earmarked for same end use project.

15. On-site waste acceptance shall be conducted in accordance with Section 3 of Form R relating to screening of incoming loads, rejection of loads, and oversize material. All incoming contaminated material shall be screened on-site for TPH, TOX, and PCBs. One grab sample per 60 tons of contaminated material containing the following (virgin or nonvirgin) hydrocarbon contaminants shall be taken and analyzed for TPH, TOX and PCBs: gasoline; jet fuel; kerosene; diesel fuel; No. 2-4 fuel oil; heating oil; alcohols; ethers; organic acids; and ethylene glycol. One grab sample per 250 tons of contaminated material containing the following (virgin or nonvirgin) hydrocarbon contaminants shall be taken and analyzed for TPH, TOX, and PCBs: The Nos. 5-6 fuel oil; asphalt; petroleum and coal tars; greases; crude oil; and lubricating oil. The maximum allowable concentration of TPH for incoming contaminated material may not exceed 45,000 mg/kg using a portable photo ionization detector (PID). The maximum allowable concentration of TOX for incoming contaminated material may not exceed 1,000 mg/kg using a Dexsil L 2000 or equivalent. The maximum allowable concentration of PCBs for incoming contaminated material may not exceed 4 mg/kg using Dexsil extraction method or equivalent.

16. A Form U document must be submitted to the DEP in accordance with the following procedures prior to the acceptance of (1) virgin and oxygenated hydrocarbon contaminated material with TPH concentrations between 10,000 and 45,000 mg/kg and (2) any nonvirgin hydrocarbon contaminated material:

a. All solid waste must be consistent with the requirements stated in the waste analysis and classification plan contained in Form R, as incorporated in Condition 1 of this permit, except to the extent that the requirements of Form R are superseded by the terms and conditions of this permit.

b. The permittee shall not accept any solid waste not included in the Form Resubmission unless a permit modification is submitted to, and approved by, DEP.

c. The permittee shall not accept, receive or process hazardous waste as defined in 25 Pa. Code Chapter 261a or 40 CFR Part 261.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

d. Virgin hydrocarbon contaminated material with TPH concentrations less than 10,000 mg/kg and contaminated material from small quantity residual waste generators do not need to have Form U documents submitted to DEP prior to their acceptance at the facility and, consequently, are not subject to the submittal and review requirements described in Condition 16f provided that they do not also involve a total metals waste acceptance limitation waiver request pursuant to Condition 14b, above. For those waste streams subject to the Form U submittal waiver of this subcondition, the permittee must keep waste characterization documents, including a Form U, on file at the facility to demonstrate that the waste streams accepted pursuant to this subcondition are not hazardous, comply with the facility's waste characterization requirements as outlined in Condition 14a, and comply with the requirements of this condition (other than 16f). A quarterly report, to be submitted within thirty (30) days of the end of the calendar quarter (January–March, April–June, July–September, and October–December), shall be submitted to the DEP's Southeast Regional Office listing information by generator, including the waste type, approved quantity, quantity accepted, generator identification number, the identification number for each Form U document, and the end use category that governed the level of remediation (see Condition 16g) for all waste received during the calendar quarter that did not require the submittal of a Form U to DEP.

e. All Form U documents must be kept on file and are to be available for inspection by the DEP. Each Form U document shall be assigned a sequential identification number that is to be recorded on all forms submitted to DEP.

f. The permittee must submit a Form U waste processing request for each waste stream not exempted from the submission requirement pursuant to Condition 16d, above. Proof of submission to the DEP shall be dated certified mail return receipt cards; signed dated, acceptance receipts for hand delivered requests; signed dated receipts for overnight mail/federal express delivery; or some other delivery/receipt mechanism as may be approved by DEP. The waste indicated on Form U may be accepted for processing by the permittee after fifteen (15) calendar days, unless also subject to the requirements of Condition 14b, above, in which case the waste shall not be accepted for processing until written DEP approval is obtained. If, at any time after the fifteen (15) calendar day period, it is determined by DEP that the waste accepted for processing is not consistent with the waste analysis and classification plan or the design of the facility, the permittee shall be subjected to all and any applicable enforcement action of the Solid

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

Waste Management Act or the DEP's rules and regulations promulgated thereunder. Absence of disapproval by the DEP before and after the waiting period does not constitute an approval or final action of the DEP.

g. All Form U documents shall indicate the intended end use mechanism for the material that is to be processed as well as the end use category (Categories 1–5, refer to Form P, Section 4.6) that will govern the level of remediation.

17. a. After exiting the thermal treatment unit, processed material shall be conveyed by radial stacker to the Remediated Product stockpile area, as indicated on Drawing No. 1A. This area, also known as the temporary stockpile area, measures approximately 50' by 36' by 20' high and shall be limited to no more than 1,333 cubic yards or 2,000 tons at any time. Material shall remain at this location until post treatment testing and analysis have been conducted to verify the effectiveness of the thermal remediation process. At a minimum, one grab sample per 50 tons of thermally processed material shall be collected and analyzed for TPH and volatile organic compounds (VOCs).

Effective thermal remediation shall be based upon none of the TPH concentrations of the grab samples exceeding the applicable category limitation and none of the VOCs concentrations exceeding 2 ppm or the individual organic compound limitations specified by the implementing mechanism for the intended end use, with the latter not to exceed 250 ppm (see Form P, Section 4.6 and Table 4). Material meeting the effective remediation standards shall be moved and stored in the processed material storage area, pursuant to Condition 18, below. Material not meeting the effective thermal remediation standards shall be moved inside the building for storage in Areas 3–6 pending reprocessing, or for staging in Area 7 for immediate reprocessing. Material returned to the building for reprocessing shall be managed as contaminated material and shall be included as part of the 17,500-ton storage limitation contained in Condition 12, above.

b. Regulated fill and direct reuse material meeting end use requirements without thermal processing but only requiring physical processing shall be moved and stored in the outside processed material storage area, pursuant to Condition 18, after physical processing.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

c. Processed material, after being blended with biosolids as a soil amendment, shall be tested for the parameters and at the frequency specified in the General Permit authorizing said processing and beneficial use.

18. a. Material meeting the effective thermal remediation standards shall be moved from the temporary stockpile area and shall be stored in the processed material stockpile area, which is a kidney-shaped area approximately 200' by 350', as shown on Drawing No. SL-01. In addition, regulated fill and direct reuse material shall be moved from Area 7 after physical processing and shall be stored in this processed material stockpile area. Within this area, processed material may be stored in any configuration within the area so long as no more than 7,407 cubic yards or 11,100 tons of material is stored at any time and so that pile height does not exceed 20'. Piles shall be adequately segregated and marked (including batch numbers as well as narrative descriptors – regulated fill, Categories 1-5 fill, etc.) according to end use requirements. All material placed in the processed material stockpile area shall meet the Category 1 effective remediation limit unless an agreement is in place with a defined end user for an end use allowing for a different effective remediation limit that also specifies a time frame for, and quantity of, the material needed (see Form P, Section 4.6 and Table 4).

b. Once each operating day, the permittee shall monitor each new pile, or each existing pile to which additional material has been added, that contains regulated fill or direct reuse material. The pile(s) shall be monitored for VOCs in accordance with Section 4.6 of Form P. If any reading for a pile exceeds 100 ppm, that pile shall immediately be covered with a tarp or cover to minimize fugitive emissions, in accordance with Section 4.7.1 of Form P. If any reading for a pile exceeds 250 ppm, that pile shall immediately be relocated back into the building for storage in an appropriate area of the building (Areas 3–6) to be managed as soil intended for thermal remediation pending reprocessing, in accordance with Section 4.7.2 of Form P. A record shall be kept of the daily VOC readings, the TPH category of the each pile(s) corresponding to the daily VOC readings (and/or actual TPH values for each pile, if known), and each incident of implementation of the control measures required pursuant to Section 4.7 of Form P (cover or tarp placement, movement of material back into the building). Material returned to the building for reprocessing shall be managed as contaminated material and shall be included as part of the 17,500-ton storage limitation contained in Condition 12, above.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

c. Pursuant to Condition 6 of this permit, and as indicated on Drawing SL-01, clean fill may be stored in a portion of the processed material stockpile area to the extent that said storage does not interfere with the permittee's ability to abide by, or comply with, the terms and conditions of this permit. Clean fill shall be segregated from processed material by a physical barrier, which may be adjusted to suit operational needs.

d. The permittee shall maintain adequate records of incoming and outgoing materials and material processed to determine the amount of processed material contained outside the building (in areas described in Conditions 17 and 18 of this permit) at any given time. Said determination must be provided to DEP upon request and shall be recorded in the facility's operational records on at least a daily basis. If the permittee, through its recordkeeping, is unable to determine the amount of contaminated material outside the building to the DEP's satisfaction, upon written request from the DEP, the permittee shall configure the processed material outside the building in such a manner as to allow for pile volume measurements or surveys to be conducted to determine the amount of processed material present.

e. The storage of processed material and clean fill shall be in a manner that will not create a nuisance or be harmful to public health, safety, or the environment, and shall be in a manner that prevents the dispersal of processed material by wind or water erosion.

f. Runoff from the processed material storage area, including runoff from processed material and/or clean fill storage areas, shall not cause surface water pollution or groundwater degradation, and shall be managed in accordance with the Clean Streams Law and regulations promulgated thereunder. Runoff from the processed material storage area shall be diverted or otherwise controlled so that runoff, including runoff-laden sediment, does not flow onto or through the clean fill storage area(s) or come in contact with clean fill material.

g. At a minimum of once per calendar quarter, the permittee shall collect a sample of stormwater runoff from the processed material storage area and analyze the sample for TPH, total suspended solids, and the thirteen priority pollutant metals (total and dissolved), unless the permittee certifies that there was insufficient rainfall to generate runoff capable of being sampled in that calendar quarter. The sample shall be collected during the initial 30 minutes of the discharge from the processed material storage area, or as soon as practicable thereafter, and shall be collected prior to discharge to the sedimentation basin. Quarterly sample results shall be

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

submitted to the DEP's Southeast Region Waste Management Manager no later than 30 days after the end of the calendar quarter for which the sample was to be taken. After obtaining four quarters of actual sample results, the permittee shall submit a report evaluating (1) the quality of the stormwater runoff; (2) the effectiveness of runoff controls; and (3) the need for continued or additional surface water and/or groundwater monitoring, pursuant to 25 Pa. Code 297.233. As a part of the evaluation, the permittee may request a reduction or elimination of the runoff-sampling program if it believes the data results support such a request. The quarterly sampling program shall remain in effect until modified or eliminated by DEP, in writing, pursuant to this condition.

19. Oversized material shall be limited to contaminated material approved for waste acceptance that fails to pass a 2-inch or larger screen. Recyclable oversized material shall be oversized material as described above that is determined to be uncontaminated based on both visual inspection and portable PID testing. Recyclable oversized material may be stored either inside the building or outside the building in the treated material stockpile area described in Condition 18, above, and may be marketed for a suitable use, pending any additional testing that may be required for said use.

    The recyclable oversized material must be weighed or measured prior to placement outside the building and shall be counted as part of the 7,407 cubic yard or 11,100-ton storage limitation contained in Condition 18, above, to prevent unacceptable amounts of "recyclable" material from being accumulated outside of coverage of the facility's bond. Nonrecyclable oversized material shall be oversized material as described above that is determined to be contaminated based on either visual inspection or portable PID testing. Nonrecyclable oversized material shall be stored inside the building in Areas 1–7 until it can be transported to an approved off-site disposal or processing facility. The amount of nonrecyclable oversized material stored in this manner, and the amount of recyclable oversized material not stored outside the building, shall be counted as part of the 17,500-ton storage limitation contained in Condition 12, above.

20. The facility is not approved to accept or process wastes other than those authorized pursuant to Conditions 11, 13, and 19 above, relating to contaminated materials, biosolids, and oversized materials, respectively, as those terms are defined or used in this permit. While it is acknowledged that there may be some unavoidable amounts of unacceptable material received, the amounts should be minimal and incidental. While the permittee has a plan to dissuade generators from sending loads containing unacceptable material by assessing a billable surcharge rate if unacceptable material of over 5 percent by

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

volume is received, issuance of this permit shall in no way be construed as acceptance of that 5 percent figure as constituting a standard for minimal or incidental as neither 120 tpd (5 percent of 2,400 tpd maximum daily volume) nor 875 tons total storage of unacceptable waste (5 percent of 17,500 tons maximum waste storage) is considered minimal or incidental.

21. The permittee shall control and minimize conditions that are harmful to the environment or public health, or which create safety hazards, odors, dust, noise, unsightliness, and other public nuisances. With regard to transportation of waste to the facility, the permittee may implement a waste transport vehicle compliance plan (see page 10 of Form R, referenced in Condition 1, above) whereby noncompliant vehicles will be subject to a "time out" to encourage compliance, subject to the following additional requirements:

a. The "time out" shall be for at least a one-hour period commencing after the vehicle would normally be allowed to tip its waste. The time required for waste pre-acceptance screening (i.e., visual inspection, sampling, analysis, analytical review, issuance of a weight ticket and signed manifest) shall not be included in the "time out." Records of "time out" occurrences (date, transporter identification, time vehicle in, time vehicle out, reason for occurrence, etc.) shall be kept as part of the daily operational record.

b. Pursuant to Section 6206(a) of Act 2002-90, the permittee may not accept a waste transportation vehicle without a current authorization sticker issued by DEP. Vehicles without the required current authorization sticker must be rejected and may not be subject to the "time out" provisions of the waste transport vehicle compliance plan.

c. Waste transportation vehicles leaving the facility shall be in compliance with the transporter requirements of Chapter 299 of the residual waste regulations as well as the requirements of Act 2002-90, when applicable.

d. The permittee shall keep a record of overweight vehicles in accordance with 25 Pa. Code 297.261(b)(12), relating to daily operational records.

e. Where repeat occurrences for a transporter indicates that the waste transport vehicle compliance plan is not effective in minimizing harms, hazards, or nuisances, it is the permittee's responsibility to take additional steps to obtain more effective compliance. This may require modification of the waste transport vehicle compliance plan. Continued reliance upon the waste

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

transport vehicle compliance plan in the face of evidence indicating a failure achieve compliance will not shield the permittee against appropriate enforcement action on the part of the DEP.

22. The TPH concentration of contaminated material entering the primary thermal unit (PTU) shall be 10,000 mg/kg or less, based on blending calculations as presented on the Soil Storage and Chemistry Summary spreadsheets appended to Form P. The permittee may request to demonstrate the facility's capability to effectively remediate contaminated material at a higher concentration by submitting to the DEP's Waste Management a protocol for such a demonstration. If said protocol is approved by the DEP, or approved with modifications, the permittee may conduct the demonstration and may utilize the results of the demonstration to seek a modification of the limitation contained herein. In such an event, the permittee may submit a permit application to the DEP to modify the subject limitation. Provided that the application seeks nothing other than to modify the 10,000 mg/kg limitation based upon the results of an approved demonstration protocol, the permit application may be processed as a minor modification to this Solid Waste Permit. Should the application contain additional modification requests, then those additional modification requests will dictate the form of the application. Nothing in this condition shall be construed as indicating a commitment on the part of the DEP to approve any such application.

23. The carbon adsorption system shall operate at all times when the PTU is not operating and hydrocarbon contaminated material is present in the building.

24. The approved Radiation Protection Action Plan (RPAP) for the Facility, included as a part of the application in Form X referenced in Condition No. 1, above, is hereby incorporated into this permit subject to the following conditions:

    a. Pursuant to Section 613 of the Solid Waste Management Act, 35 P.S. Section 6018.613, DEP may recover its costs to abate a public nuisance related to radioactive waste, including its costs of management, transport, and disposal of the radioactive waste processed, stored, disposed, or rejected at the facility.

    b. Approval of the RPAP does not guarantee operational effectiveness. Failure to operate this equipment to perform as intended or designed, and implement the RPAP according to the application documents herein approved, for any reason, shall be sufficient grounds for revocation or suspension of the facility's waste permit in part or in its entirety.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

25. a. Contaminated material shall be processed, thermally remediated, and tested to the extent necessary to allow the processed waste to be used lawfully and consistent with the applicable standards for the intended uses. The testing frequencies and acceptance criteria for incoming contaminated material approved in this permit are intended to allow for a hazardous waste determination and to provide sufficient data to establish blending ratios and production run concentrations for the purpose of physically processing and/or thermally remediating hydrocarbon contaminated material. The post production testing approved in this permit is intended for determining the effective remediation of TPH and VOCs as a process control. The testing frequencies, parameters, and criteria approved in this permit are not intended to be, and shall not be construed as, a substitute for the need to satisfy the testing frequencies, parameters, and criteria of the implementing regulatory mechanism under which a particular production run or batch of processed material is intended to be used. The permittee remains responsible for conducting any and all necessary testing, beyond the minimum requirements contained in this permit that may be required to satisfy the implementing mechanism for off-site use or disposal of processed contaminated material. The permittee shall, as part of the daily operation record, maintain adequate documentation to demonstrate compliance with this requirement.

b. Any material intended for use as regulated fill shall have been determined to be regulated fill in accordance with the requirements of the DEP's Management of Fill policy (Document No. 258-2182-773) prior to receipt and acceptance at this facility. Processing of regulated fill at this facility shall be limited to physical processing of regulated fill and/or blending of regulated fill only with other regulated fill. Approval for the beneficial use of the regulated fill material pursuant to General Permit No. WMGR096 shall be obtained for each processed batch pile and the application must include the results of this facility's waste acceptance testing, blending calculations, and post-process testing requirements. This facility shall not be considered a "source" of regulated fill, but may generate a processed batch pile of material that is suitable for use as regulated fill, subject to each batch pile qualifying for, and obtaining coverage under, General Permit No. WMGR096.

c. In cases where the implementing regulatory mechanism specifies end use parameters but does not specify testing frequencies to demonstrate compliance with those parameters, the permittee shall, at a minimum, obtain either pre- or post-testing data at the frequencies specified in Form R, Table 1, for any end use parameter not included in Table 1.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

26. In the event that generator data is used to demonstrate compliance with end use inorganic requirements, the permittee shall collect a minimum of one grab sample per 250 tons (or increment thereof) of a production run for the purpose of conducting inorganic analysis confirmation testing. The grab samples so collected for a production run may be composited such that one composite is made for every 5,000 tons (or increment thereof) of each production run, and the composite(s) shall be analyzed for inorganics. The results of the inorganic analysis/analyses shall be compared to the blending calculation estimates to verify the accuracy of the blending procedures. Should a composite analysis differ from the blending calculation estimate by more than 10 percent, then actual post processing test results must be used if greater than the blending estimate for that production run. The permittee shall keep records of the inorganic confirmation testing as part of the daily operation record and shall submit quarterly reports to the DEP's Southeast Regional Office (Waste Management Manager) detailing the results of the confirmation testing and describing any steps taken to explain and/or correct the inadequacies of the blending procedures.

27. In the event that actual post processing test data is used to demonstrate compliance with end use inorganic requirements, the results of the post processing inorganic analysis/analyses shall be compared to the pertinent blending calculation estimates to verify the accuracy of the blending procedures, and a record of the results of each comparison shall be made part of the daily operation record. Should the analysis/analyses differ from the blending calculation estimate by more than 10 percent, the permittee shall investigate the reason for the deviation and shall note in the daily operation record any steps taken to explain and/or correct the inadequacies of the blending procedures.

28. No waste may be stored at this facility for a period of more than one year. All processed material shall be managed as waste while at the facility. When being transported from the facility for off-site use, processed material shall be managed in accordance with the implementing regulatory mechanism under which it is intended to be utilized.

29. Revisions to the DEP's Management of Fill policy (Document No. 258-2182-773) dated August 7, 2010, shall constitute grounds for reopening this permit to make any necessary modifications as may be warranted by the revisions.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

Soil Drying Agents:

30. Only the following, commercially-available drying agents may be utilized to reduce the contaminated soil's moisture content and to condition the contaminated soil to improve screening performance and/or rate of transfer through the thermal treatment, and only for contaminated soils that have excess moisture content (10 to 30 percent):

A. Diatomaceous Earth
B. Sand
C. Clay
D. Vermiculite
E. Lime
F. Lime Kiln Dust (LKD)
G. Cement Kiln Dust (CKD)
H. Portland Cement (PC)

For the purpose of this permit modification, the commercially-available drying agents listed in Condition No. 30A-E shall consist of virgin-source materials not otherwise contaminated by use or by the addition or introduction of other materials, either pre or post-mining and/or manufacturing. These drying agents shall also meet the acceptance concentration limits for non-LKD/CKD/PC drying agents, as contained in Form R. Soils not otherwise captured by the list of commercially-available drying agents listed in Condition No. 30A-E shall not be mixed or blended with contaminated soils except to the extent that contaminated soils removed from storage from Areas 1 to 6 may be blended in Area 7 to modify consistency or improve material handling characteristics (i.e., adding drier contaminated soils to wet contaminated soils) pursuant to the blending procedures previously authorized in Sections 3.1 and 4.3 of Form P.

Any soil mixtures resulting from the use of the commercially-available drying agents listed in Condition No. 30F-H shall be managed as a waste. Additionally, each new source of LKD/CKD/PC shall meet, and be accepted in accordance with, the preacceptance procedures for drying agents specified in Form R, unless the material is a "coproduct." If the LKD/CKD/PC has been determined to be a "coproduct" pursuant to the requirements specified in 25 Pa. Code 287.8 or 287.9, a notification by the permittee to that effect shall be submitted for approval by the DEP for each source of LKD/CKD/PC proposed to be used as a drying agent. Each notification shall include supporting documentation that the permittee's use

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

of the material is consistent with the original coproduct determination.

31. On an annual basis, the suppliers/manufacturers of each drying agent utilized by the permittee must provide, or the permittee shall otherwise obtain, an analysis for total metals to ensure compliance with the limits referenced in Table FP-1b of the DEP's August 7, 2010, Management of Fill Policy.

32. A drying agent listed in Condition No. 30A-E, above, may be used as a conditioner prior to soil processing only if the drying agent first meets the DEP's clean fill numerical limits as specified in the Tables FP-1a and FP-1b of the DEP's August 7, 2010, Management of Fill policy prior to mixing or blending with any other material.

33. The maximum amount of drying agent, either singly or in combination with other drying agents, which may be applied to contaminated soil as a conditioner prior to processing shall not exceed 7.0 percent, by weight, of the contaminated soil to be processed.

34. Storage areas for the drying agents listed in Condition No. 30A-E, above, are designated on Figure 1, "Soil Drying Agent Storage Location." The drying agents listed in Condition No. 30F-H, above, shall either be stored inside the processing building, in the same manner as a waste, or outside the building in closed containers or a closed storage unit, as shown in Figure 1.

35. Processed soils resulting from the processing of mixtures of contaminated soil and a drying agent listed in Condition No. 30A-E, above, shall be considered dewasted pursuant to 25 Pa. Code 287.7(b), provided that the following terms are satisfied:

    A. The processed soil/drying agent mixture meets the clean fill numerical limits as specified in the Tables FP-1a and FP-1b of the DEP's August 7, 2010, Management of Fill policy.

    B. The use of the processed soil is limited to use as a daily cover at a permitted landfill, provided that the use is also authorized pursuant to the receiving landfill's permit.

    If either Condition 35A or 35B are not met, then the processed soil shall be managed as a waste pursuant to 25 Pa. Code 287.7(c) and this permit, unless some end use mechanism or approval, outside of this permit, provides for or otherwise authorizes the use of the specific soil/drying agent mixture in a

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT

Permit
For
Solid Waste Disposal and/or Processing Facility
FORM NO. 8

Permit No. 301254
Date Issued July 19, 2017
Date Expired July 19, 2027

different manner. In the latter case, the soil/drying agent mixture may be managed in accordance with the end use mechanism or approval once removed from this facility.

36. Processed soils resulting from the processing of mixtures of contaminated soil and a drying agent listed in Condition No. 30F-H, above, shall be managed as a waste pursuant to this permit, unless some end use mechanism or approval, outside of this permit, provides for or otherwise authorizes the use of the specific soil/drying agent mixture in a different manner. In the latter case, the soil/drying agent mixture may be managed in accordance with the end use mechanism or approval once removed from this facility.

37. Material accepted at the facility shall not contain free liquids and shall pass the paint filter liquids test.

38. No approval conveyed pursuant to this permit modification is intended to be, nor shall be it be in any way construed as, a warrantee or guarantee of the suitability of a processed soil/drying agent mixture to meet or otherwise satisfy any physical, chemical, or structural performance specification for the selected end use of said mixture. Any such determination is solely the responsibility of the permittee and/or the end user.

39. A valid and current certificate of liability insurance shall be maintained at the Facility. A copy of the current certificate, listing DEP as a certificate holder and providing a 60-day notice period prior to cancellation or termination, shall be submitted to DEP's Southeast Regional Office, Waste Management Program, as required by 25 Pa. Code Section 271.374 of the regulations.

40. The bond between the permittee and DEP in the current amount of $1,930,000.00 is hereby approved as part of this permit. Upon receipt of written notice from DEP, this bond will have to be updated within 90 days, in accordance with 25 Pa. Code Section 287 of the Residual Waste Regulations.

Re 30 (rc17wm) 200.1