HAZARDOUS MATERIALS HEALTH AND SAFETY PLAN

Arlington Department of Public Works
Redevelopment Project
51 Grove Street
Arlington, Massachusetts

Prepared For:
COMMOMDORE BUILDERS
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1.0 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

Site Description Information is from the Project RAM Plan developed by Weston & Sampson

Introduction

The ADPW has occupied the Site since 1961 and has utilized the Site for administrative offices and as an operations center for DPW activities including vehicle fueling, vehicle maintenance and storage, and material storage. The DPW Yard includes several buildings, paved drive and parking areas, and a fuel pump island with underground storage tanks (USTs). Historically, the Site was occupied by a mill and a saw blade manufacturer in the 1800s. A chrome plating manufacturing facility operated at the Site in the early 1900s. A manufactured gas plant (MGP) facility occupied the Site in the mid-1900s prior to ADPW occupying the Site.

The Site is a listed release site with the Massachusetts Department of Environmental Protection (DEP) under Release Tracking Number (RTN) 3-4241. This RTN is associated with the identification of impacted soil and groundwater during Site assessment activities performed in 1991. Contaminants of concern for this RTN included chromium, polynuclear aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), petroleum hydrocarbons, lead and cyanide. The source of impacts is from historic use of the Site for chrome ore processing, manufactured gas plant (MGP) operations, and DPW yard operations. A Class C Response Action Outcome (RAO) Statement was submitted in October 2007 to support a Temporary Solution for RTN 3-4241. As part of the Temporary Solution, the Site is currently in Remedy Operation Status (ROS) with the DEP and monitoring is continuing to be performed to inspect and maintain previously installed direct contact barriers (DCBs) which consist of asphalt pavement and building foundations and slabs throughout the Site. An Activity and Use Limitation (AUL) was recorded in 2018 to ensure that Site use is maintained as a DPW facility, DCBs are maintained, to provide requirements for soil management and health and safety, and to restrict the construction of buildings within certain hot spot areas. A parcel of land adjacent to the Site is occupied by an Arlington High School (AHS) soccer field and will be developed as a parking lot for future ADPW operations. This area is also within this disposal site boundary for RTN 3-3421. An Engineered Barrier was previously constructed in this location to prevent access to contaminants. Construction activities in this area will be performed under a Phase IV Modification which will be submitted to the DEP in the future and prior to any planned construction excavation activities.

Site Location

The Site subject to this RAM Plan is an approximately 4.5-acre parcel of land located at 51 Grove Street in Arlington, Massachusetts. The Site is an active DPW facility and is located approximately 525 feet northwest of the intersection of Grove Street and Massachusetts Avenue.

A total of seven buildings are currently located at the Site and include two administration / office

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buildings, two vehicle and/or equipment storage buildings, two salt shed buildings, and one transfer station building. A vehicle fueling pump island with associated USTs is also located on-Site. The remainder of the Site is paved and utilized for parking of DPW vehicles and equipment. A stream (Mill Brook) runs through the central portion of the Site.

The Site is located in a residential and commercial area of Arlington. Grove Street, residential properties, a National Grid property, and a bike path border the Site to the north. Portions of the Arlington High School complex border the Site to the east and south. The Site is bordered to the southeast and east by Grove Street and residential properties.

Site Contamination

Contaminants of concern include chromium, PAHs, VOCs, petroleum hydrocarbons, lead and cyanide. The source of impacts is from historic use of the Site for chrome ore processing, MGP operations, and DPW yard operations.

Brown & Caldwell has summarized the concentrations of onsite soil contaminants found from several site assessments performed over a multi-year period. This information is contained in a document titled "Health and Safety Plan Guidance – DPW Yard Property - 2018". This plan and project specification documents have been reviewed by the Certified Industrial Hygienist (CIH) for the development of this plan.

Contaminant	Range of Detected Concentrations in Soil (mg/kg)	Range of Detected Concentrations in Groundwater (mg/L)
Total Chromium	21 to 39,000	0.03 to 63
Hexavalent Chromium	1.5 to 6,790	0.0016 to 100
Lead	1 to 1,580	0.0014 to 0.0067
Zinc	25 to 176	0.0087 to 0.018
Cyanide	0.33 to 160	0.02 to 15
VOCs	0.0052 to 260	0.001 to 16
PAHs	0.0045 to 2,600	0.00012 to 9.95
EPH Fractions	36 to 3,300	0.27 to 5.5
VPH Fractions	1.1 to 1,700	0.0027 to 3.2
TPH	2.6 to 42,000	0.008 to 17

Asbestos has been identified in existing building materials. Specific requirements for handling asbestos will be addressed in a separate plan.

There are hot spots throughout the project site. These hotspots are areas where workers will have elevated risk for chemical exposure potential. The provisions in this plan for personal protective equipment, air monitoring, site exclusion zones and decontamination requirements are designed to ensure worker health and safety.

Areas of the site that have elevated chromium concentrations in the soil have the potential to contain hexavalent chromium at concentrations above the Site Specific Allergic Contact Dermatitis threshold concentration of 700 mg/kg. Skin protection will be extremely important when working in these areas.

Project Overview

This project consists of new construction as well as the renovation of four existing buildings to provide a municipal services facility, housing four Arlington town departments, Inspectional Services (ISD), Public Works (DPW), Town Information Technology (IT), and Town Facilities, at the existing 51 Grove Street Town Yard site. The project includes the demolition of four existing buildings complete with foundations, the construction of a new parking lot in place of an old town soccer field, the replacement of an existing concrete culvert running through (under) the site, and installation of all new UG utilities to the new building with extensions to the remaining four existing buildings.

The new construction will consist of a 42,000 SF Operations building, to house DPW offices, maintenance, and workshop space, and ISD offices; along with a new Salt Shed and town-wide fueling facility (with underground fuel storage tanks), that support DPW operations.

The renovation of the existing buildings will consist of exterior envelope and roof repairs / upgrades as well as new / upgraded interior finishes and mechanical & electrical systems. The renovated buildings will house the Town's IT department offices and Server Room, Town Facilities department offices and workshops, as well as DPW vehicle and equipment storage.

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2.0 HAZARD ASSESSMENT AND ACCIDENT PREVENTION

2.1 GENERAL

The hazard assessment identifies the chemical, physical, and biological hazards of concern for each site task and/or operation to be performed involved. The Certified Industrial Hygienist (CIH) has reviewed the Weston & Sampson RAM Plan, Brown & Caldwell Health and Safety Plan Guidance

2.2 HAZARD ASSESSMENT

2.2.1 CHEMICAL HAZARDS

Prior analysis of soils and groundwater in the work areas indicates the presence of chromium, PAHs, VOCs, petroleum hydrocarbons, lead and cyanide. It has been assumed that these contaminants can be encountered at any location on the site. Each time soil is disturbed it must be assumed that workers are potentially exposed to onsite contaminants.

The potential inhalation hazard is thought to be low to moderate.

The contaminants present may be absorbed through the skin. The contaminants listed above, plus other site contaminants may cause skin and eye irritation. The RAM Plan submitted to the Massachusetts Department of Environmental Protection (Mass DEP) by Weston & Sampson indicates there are chromium hotspots (5,000 mg/kg) present onsite. These locations can include hexavalent chromium (Chrome VI) at concentrations above 200 mg/kg. At this concentration, the potential for contact dermatitis increases. Skin protection will be required with all contaminated soil contact on this project.

The potential impact to offsite receptors is thought to be low. Dust generation is expected to be minimized by active dust control measures.

Skin and eye irritation potential is thought to be moderate. Proper personal protective equipment (PPE) will be worn when working in the exclusion zone. The indicator contaminants of concern for potential human exposure on and possibly off this site include the following (see Table 1, page 38, for exposure limits):

<u>SEMI VOLATILE COMPOUNDS (Polynuclear Aromatic Hydrocarbons)</u>

Some PAH's are carcinogenic causing tumors both at the site of application and systemically. They also cause skin disorders and act as immunosuppressants. The carcinogenic PAHs are usually the higher molecular weight compounds, containing four to six fused aromatic rings. The noncarcinogenic PAHs (i.e., naphthalene) are lower molecular weight compounds with comparatively less toxic properties. In general, adverse health effects to the liver and kidney have been associated with oral exposure to PAHs. Workers exposed to PAHs have exhibited chronic dermatitis and other skin disorders. The majority of the carcinogenic PAHs are derivatives of

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benzo(a) anthracene, chrysene, benzo (a) pyrene, benzo (c) phenanthrene and cholanthrene. PAHs are highlighted below according to their carcinogenicity.

Carcinogenicity of PAH's

Chemicals for which there is sufficient evidence that they are carcinogenic in animals:

Benzo (a) anthracene
Benzo (b) fluoranthene
Benzo (k) fluoranthene
Benzo (a) pyrene
Dibenzo (a,h) anthracene
Indeno (1,2,3-c,d) pyrene

Chemicals for which there is limited evidence that they are carcinogenic in animals:

Fluorene Phenanthrene
Benzo (g,h,i) perylene
Acenaphthene
Chrysene

METALS

Chromium

Chromium metal, other than the hexavalent form is relatively low in toxicological impact. There is little evidence of significant toxicity from chromic or chromous salt. Dermatitis has been associated with some chromium compounds. Hexavalent chromium compounds may cause chrome ulcers, irritative dermatitis or nasal septal perforation. Exposure to certain hexavalent chromium compounds, mainly water insoluble, has been related to an increase in lung cancer. Water insoluble hexavalent chromium is a confirmed human carcinogen. There is little data available from which a dose response relationship can be developed.

Hexavalent Chromium

Workplace exposure to hexavalent chromium may cause the following health effects:

- lung cancer in workers who breathe airborne hexavalent chromium
- irritation or damage to the nose, throat, and lung (respiratory tract) if hexavalent chromium is breathed at high levels
- irritation or damage to the eyes and skin if hexavalent chromium contacts these organs in high concentrations

Breathing in high levels of hexavalent chromium can cause irritation to the nose and throat.

Symptoms may include runny nose, sneezing, coughing, itching and a burning sensation.

Repeated or prolonged exposure can cause sores to develop in the nose and result in nosebleeds. If the damage is severe, the nasal septum (wall separating the nasal passages) develops a hole in it (perforation).

Breathing small amounts of hexavalent chromium even for long periods does not cause respiratory tract irritation in most people.

Some employees become allergic to hexavalent chromium so that inhaling chromate compounds can cause asthma symptoms such as wheezing and shortness of breath.

Some employees can also develop an allergic skin reaction, called allergic contact dermatitis. This occurs from handling liquids or solids containing hexavalent chromium. Once an employee becomes allergic, brief skin contact causes swelling and a red, itchy rash that becomes crusty and thickened with prolonged exposure. Allergic contact dermatitis is long-lasting and more severe with repeated skin contact.

Direct skin contact with hexavalent chromium can cause a non-allergic skin irritation. Contact with non-intact skin can also lead to chrome ulcers. These are small crusted skin sores with a rounded border. They heal slowly and leave scars.

Lead

Lead poisoning occurs from inhalation or ingestion of lead. Exposure to lead results in damage to the nervous, urinary, and reproductive systems and inhibit synthesis of the molecule heme, which is responsible for oxygen transport in living systems. The adverse health effects associated with exposure to lead range from acute, relatively mild, perhaps reversible stages such as inhibition of enzyme activity, reduction in motor nerve conduction velocity, behavioral changes, and mild central nervous system (CNS) symptoms, to permanent damage to the body, chronic disease, and death.

The most frequent early symptoms of lead poisoning are anxiety, nervousness, irritability, and abnormal tiredness. A variety of aches, pains, loss of appetite, constipation, insomnia, headache, fine tremors, and muscle weaknesses are common. Muscle paralysis such as "wrist drop", severe abdominal cramps or "lead colic" and discoloration of the teeth or "lead line" are characteristic of only the most severe cases. Anemia is frequently found if a blood test is performed. Any or all of these effects may occur after a few weeks of relatively heavy lead absorption, and they may last for many months after the exposure ceases.

Exposure to lead results in decreased libido, impotence and sterility in men and decreased fertility, abnormal menstrual and ovarian cycles in women. The course of pregnancy is adversely affected by exposure to lead. There is conclusive evidence of miscarriage and stillbirth in women who were exposed to lead or whose husbands were exposed. Children born of parents either or who were exposed to lead are more likely to have birth defects, mental retardation, behavioral disorders or die

during the first year of childhood.

Possible late effects of lead exposure include kidney disease and high blood pressure.

Arsenic

The toxicity of arsenic depends upon its chemical form along with the route, dose, and duration of exposure. In general, arsenites (As^{+3}) are potentially more toxic than arsenates, soluble arsenic compounds are potentially more toxic than insoluble compounds, and inorganic arsenic compounds are potentially more toxic than organic derivatives (U.S. EPA, 1985).

Absorption from the gastrointestinal tract is dependent upon the solubility of the specific arsenic compound and the dose. Absorption from the respiratory tract is also dependent upon the specific arsenic compound, along with particle size.

Depending upon dose and exposure route, arsenic is an irritant of the skin, mucous membranes, and the gastrointestinal tract. Acute toxicity from the ingestion of higher doses of arsenic may result in vomiting, diarrhea, convulsions, a severe drop in blood pressure, and cardiovascular effects. The lethal dose for humans is reported to be 1.0 to 2.6 mg/kg-bw. Acute toxicity from inhalation exposure to arsenic adsorbed to particulate matter may results in conjunctivitis and pharyngitis. Subchronic effects included hyperpigmentation (melanosis), multiple arsenical keratoses, sensory-motor polyneuropathy, persistent chronic headache, lethargy, gastroenteritis, and mild iron deficiency anemia. Inhaled arsenic compounds have been reported to be associated with skin lesions, cardiovascular and respiratory effects, and peripheral neuropathy. The symptoms of chronic inhalation exposure to arsenic compounds are similar to those associated with chronic oral toxicity.

According to EPA data, arsenic exposure at certain doses may produce a pattern of skin disorders, hyperpigmentation, and keratosis that may develop into basal or squamous cell carcinoma. Several epidemiological studies of workers occupationally exposed to arsenic have reported a correlation between this exposure and mortality due to respiratory cancer. Based upon epidemiological data, the EPA has classified arsenic as Group A – Human Carcinogen.

Zinc

No studies were located regarding reproductive effects, developmental effects, cancer musculoskeletal, endocrine, dermal, or body weight effects in humans or animals after inhalation exposure to zinc or zinc compounds.

Metal fume fever, a well-documented acute disease induced by intense inhalation of metal oxides, especially zinc, impairs pulmonary function but does not progress to chronic lung disease (Brown 1988; Drinker and Drinker 1928; Malo et al. 1990). Symptoms generally appear within a few hours after acute exposure, usually with dryness of the throat and coughing (Drinker et al. 1927b). The

most prominent respiratory effects of metal fume fever are sub sternal chest pain, cough, and dyspnea .

Cyanide

This plan assumes that cyanide may be present in both complex and free forms. Data from MGP sites indicate that complexed cyanides and thiocyanate with some free cyanide may be present. The toxicity of the cyanide complexes is dependent upon the susceptibility of the compounds to chlorination, acidification, and hydrolysis. Hydrogen cyanide (HCN) gas is very toxic. Hydrogen cyanide gas is irritating at very low concentrations and is considered dangerous at concentrations exceeding 20 ppm. Cyanide rapidly inhibits cytochrome oxidase, which is essential for tissue respiration. Symptoms of acute cyanide poisoning include headaches, giddiness, palpitations, and unconsciousness.

Total Petroleum Hydrocarbons (TPHs)

It is not expected that contaminants associated with TPH would create a significant vapor hazard unless work is performed in a space that is partially enclosed. Skin contact with TPH contaminated materials may result in dermatitis.

VOLATILE ORGANIC COMPOUNDS (VOCs)

Naphthalene

Inhalation of naphthalene vapor may cause irritation of the eyes, skin, and respiratory tract, and injury to the cornea. Other symptoms are headache, nausea, confusion, and excitability. The routes of exposure of this compound into the body are inhalation, ingestion, and absorption through the skin; and the organs that may be affected are the eyes, liver, kidney, blood, skin, and central nervous system.

According to the ACGIH documentation of the TLV's, the human acute lethal dose of naphthalene is estimated to be between 5 and 15 grams. The inhalation of naphthalene vapor may cause headache, loss of appetite, and nausea. Optical neuritis, corneal injuries, and kidney damage have also been reported. Opacities of the lens have been reported in 8 of 21 workers who had been exposed to naphthalene for about 5 years. More recent reports of cataracts induced by exposure to naphthalene vapors could not be found by the U.S. Agency for Toxic Substances and Disease Registry (ATSDR). Ingestion of naphthalene in relatively large amounts has caused severe hemolytic anemia and hemoglobinuria.

The odor threshold for naphthalene is in the vicinity of 0.038 ppm, which is well below the Occupational Exposure Limit.

The OSHA standard for naphthalene is 10 ppm as an eight hour average. The ACGIH has carcinogenicity rating of A3 (Confirmed Animal Carcinogen with Unknown Relevance to

Humans).

2.2.2 EXCAVATIONS AND TRENCHING

The contaminated material at the Arlington DPW site will be excavated to various depths with a maximum up to about 7.5 feet. Excavation is required for foundation and utility installations. To avoid collapse the excavated area will be appropriately sloped. If existing utilities are encountered sheeting will be used to prevent soil cave in.

Excavation is defined to include trenches. The procedures are intended to protect personnel from the hazards of collapse. This procedure follows the guidelines set forth by OSHA regulation 29 CFR 1926 subpart P.

This program will apply to all excavation and trenching activities. Employees involved in excavation and trenching work activities will be trained on the potential dangers that they will potentially be exposed to. Dangers of excavations can include:

- Trip, slips, and fall hazards
- Confined Spaces
- Overhead Hazards
- Cave-ins (entrapment and asphyxiation)
- Atmospheric Hazards

Prior to any work activities associated with excavation and trenching, a competent person must evaluate the area for hazards associated with the type of work to be performed. Inspection of the excavation and equipment, hazardous atmospheres, or other hazardous conditions will be performed daily by a competent person. The competent person will also determine the soil classification for the excavation. Only trained and qualified employees will work in the excavated areas.

Note: The term "Competent Person" is used in many OSHA standards and documents. As a general rule, the term is not specifically defined. In a broad sense, an OSHA competent person is an individual who, by way of training and/or experience, is knowledgeable of applicable standards, is capable of identifying workplace hazards relating to the specific operation, is designated by the employer, and has authority to take appropriate actions (29 CFR 1926.32). Some standards add additional specific requirements which must be met by the competent person.

Trenches and excavations four feet or more shall be properly sloped, benched, or shielded to prevent injuries associated with cave-ins. Excavations shall be sloped or benched in compliance with OSHA standard 29 CFR 1926 Subpart P, App. B. Protective systems shall be properly maintained and inspected to prevent collapse by a competent person.

Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating. The excavation shall be dewatered and a visual inspection of the excavation walls shall be performed before any worker enters the excavation.

Equipment, materials, and stockpiles will be kept two feet away from the open excavation edges. Barricades will be placed around excavation edges to prevent personnel from accidentally falling into the excavation.

Adequate means of egress will be provided inside excavations to ensure safe access and egress for all workers. Ladders will be provided and placed such that the lateral travel distance of workers inside the trench does not exceed 25 feet. The top of the ladder should extend 36" above the landing and be positioned or tied down to prevent the ladder from moving or falling when an employee is on it.

The following points must be considered when entering a trench:

- Vehicle Traffic
- Adjacent Structures and Their Condition
- Soil types
- Groundwater/Surface Run-Off
- Underground Utilities
- Weather
- Shoring
- Atmospheric conditions and testing

Trenches with depths of four feet or more, under certain conditions, have the potential to contain a hazardous atmosphere. The onsite competent person will determine if air monitoring is required. If the competent person deems the trench could contain a hazardous atmosphere the trench will be tested prior to workers entering to ensure that there is no dangerous conditions associated with the air quality. The air monitor should test for oxygen levels, explosive limits, carbon monoxide, and hydrogen sulfide.

At a minimum, the following atmospheric conditions need to be met prior to entering an excavation more than 4 feet deep if possible atmospheric hazards exists:

1. Oxygen concentration must be between 19.5% - 23.5%. Normal atmospheric oxygen concentration is 20.9%.
2. The concentration of explosive/flammable gases must be below 10% of the lower explosive limit (LEL)
3. Carbon monoxide concentration must be maintained below 35 parts per million (ppm)
4. Hydrogen sulfide concentration must be maintained below 10 parts per million.
5. Volatile Organic Compounds (VOCs) must be maintained below 15 parts per million to enter without a respirator.
6. Hydrogen Cyanide concentrations must be maintained below 3 parts per million.

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If adequate atmospheric levels are not maintained, workers will be evacuated out of the excavation or trench until levels are safe or proper ventilation is provided. Air monitoring sampling should be taken simultaneously while workers are in the trenches, because atmospheric conditions can change.

All workers involved with trenching and excavation activities shall be trained on the dangers of excavations and trenches. Upon completion of excavation and trenching training employees should be familiar with:

- Soil classifications
- Dangers of excavation atmospheres
- Use of protective systems, sloping, and benching
- Dangers of underground utilities
- Overview of OSHA CFR 1926 Subpart P

Training documentation to be kept on site and will include the date, instructors name, topic, employees name and signature.

2.2.2.1 General Requirements

Safety operations while working in and around excavations involve many factors. Factors to be evaluated and discussed at a pre-job briefing, at a minimum, the following topics should be addressed:

- Surface Encumbrances
  All surface encumbrances that are located so as to create a hazard to employees must be removed or supported as necessary to safeguard employees.

- Underground Installations/Utility Locations
  The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, and any other underground installations that reasonably may be expected to be encountered during excavation work, must be determined prior to opening an excavation. This can be accomplished by calling 1-800-DIG-SAFE or 811

- Utility companies or the state utility protection service must be contacted at least two working days prior to excavation activities to be advised of the proposed work, and asked to establish the location of the utility underground installation prior to the start of actual excavation. A private utility marking company will mark utility locations prior to work commencing.

- Sub-contractors should be careful to protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations.

- If the marking of the utility location are destroyed or removed before excavation

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commences or is completed the competent person must notify the utility company or utility protection service to inform them that the markings have been destroyed. Normally, it will take two working days of notice for the utility protection service to re-mark locations.

- Contractors must maintain a reasonable clearance between any underground utility and the cutting edge or point of powered equipment.

- When excavating with powered equipment within 18 inches of the markings of underground facilities, personnel should conduct the excavation in a careful and prudent manner, excavating by hand to determine the precise location of the facility/utility and to prevent damage.

- While the excavation is open, underground installations shall be protected, supported, or removed as necessary to safeguard employees.

- Means of Egress from Trench Excavations
  A stairway, ladder, ramp, or other safe means of egress shall be located in trench excavations that are four feet or more in depth so as to require no more than 25 feet of lateral travel for employees.

2.2.2.2 Exposure to Vehicular Traffic

Employees exposed to public vehicular traffic must be provided with and wear warning vest or other suitable garments marked with or made of reflectorized or high visibility material. A traffic diversion plan has been designed for this work and is found in the Work Phasing Plan submitted under separate cover.

2.2.2.3 Exposure to Falling Loads

No employee is permitted underneath loads handled by lifting or digging equipment. Employees must be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in cabs of vehicles being loaded or unloaded when vehicles are equipped, in accordance with 29 CFR 1926.601(b)(6), to provide adequate protection for the operator from falling objects during loading and unloading operations.

2.2.2.4 Warning Systems for Mobile Equipment

When mobile equipment is operated adjacent to an excavation or when such equipment is required to approach the edge of an excavation and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand, or mechanical signals or stop logs. If possible, the grade should be away from the excavation.

2.2.2.5 Protection of Employees from Loose Rock or Soil

Adequate protection must be provided to protect employees from loose rock or soil that could pose

a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the excavation face to stop and contain falling material; or other means that provide equivalent protection.

Employees must be protected from excavated or other material or equipment that could pose a hazard by falling into excavations. Protection must be provided by placing and keeping such material or equipment at least two feet away from edge of the excavation, or by use of retaining devices that are sufficient, or by a combination of both of necessary.

2.2.2.6 Inspections

Daily inspections of excavation, the adjacent areas, and protective systems must be made the subcontractor's competent person for evidence of a situation that could result in possible cave-ins, indication of failure of protective systems, hazards, atmospheres, or other hazardous conditions. An inspection must be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections must also be made after every rainstorm, or other hazard increase occurrence, these inspection are required when employee exposure can be reasonably anticipated.

When the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazards atmospheres, or other hazardous conditions, exposed employees should be removed from the area until the necessary precautions have been taken.

(a) To be a "competent person" under this standard, a person must have had training in, and be knowledgeable about, soils analysis, the use of protective systems and the requirements of this standard.

(b) The competent person having such training and knowledge must be capable of identifying existing and predictable hazards in excavation work and have the authority to take prompt measures to abate these hazards. Thus, a backhoe operator who would otherwise meet the requirements of the definition is not a competent person if the person lacks the authority to take prompt corrective measures to eliminate existing or potential hazards.
Inspections.

1926.651(k)(1)

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

1926.651(k)(2)

Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

2.2.2.7 Soil Classification

This section was based on OSHA Soil Classification Appendix A to subpart P.

- Type A soil means:

  Cohesive soil with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soil are: clay, silty clay, sandy clay, clay loam, and in some cases silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered type A. However, no soil is considered Type A if:

  - The soil is fissured; or
  - The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
  - The soil has been previously disturbed; or
  - The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical or greater: or
  - The material is subjected to other factors that would require it to be classified as a less stable material.

- Type B soil means.

  - Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5tsf (144kPa)
  - Granular cohesion less soils including: angular gravel, silt, silt loam, sandy loam, and in some cases, silty clay loam, and sandy clay loam.
  - Previously disturbed soils except those which would otherwise be classified by Type C soil.
  - Soil that meets the unconfined compressive strength or cementation requirement for Type A, but is fissured or subject to vibration; or dry rock that is not stable; or material that is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical, but only if the material would otherwise be classified as Type B.

- Type C soil means

  - Cohesive soil with an unconfirmed compressive strength of 0.5 tsf (48 kPa) or less: or

- Granular soils including gravel, sand, and loamy sand; or
- Submerged soil or soil from which water freely seeping; or
- Submerged rock that is not stable: or
- Material in a sloped, layered system where the layers dip into an excavation or a slope of four horizontal to one vertical or steeper.

2.2.2.8 Working Near Utility Lines

It is the policy of Commodore Builders not to allow subcontractors to mechanically excavate within ten feet of a 13 KV line (or higher) above or below ground. It is also policy not to hand excavate within two feet of a 13 KV line (or higher).

2.2.3 HEAVY EQUIPMENT OPERATIONS

All personnel on-site should be aware of the hazards of working with and around heavy equipment. Visibility problems create the largest hazard for the operator and ground personnel. Never park behind a piece of heavy equipment and always give the right of way to the equipment. **When in the vicinity of equipment operations be sure to make the operator aware of your presence.**

Physical hazards during site work can arise from various site activities, including off-loading heavy equipment from tractor-trailers and locating equipment to designated areas. Hazards will be mitigated by using caution around moving equipment and by avoiding close proximity to moving equipment whenever possible. Field personnel may be exposed to a variety of physical injury hazards associated with equipment operations, include noise, struck-by injuries, eye hazards, and hand and foot injuries. Heavy equipment should be inspected when it is first brought on site and at the start of work each day.

All site personnel will wear safety vests while on site for operator visibility. Warning barriers will be setup around heavy equipment if employees are working in the vicinity of the operating equipment.

2.2.4 VEHICLE TRAFFIC

Employees will be exposed to vehicle accident hazards during the project. To control these hazards, the following safety requirements must be strictly enforced.

- Seat belts should be worn ANYTIME a vehicle is in motion, regardless of speed or distance to be traveled. Seat belt requirements also apply to the operation of construction equipment; and
- Basic speed laws should be followed at all times. Vehicles should not be operated at speeds unsafe for the site-specific conditions (i.e., road surface, traffic, visibility, weather, etc.).
- Safety cones and barriers will be utilized to delineate work zones when working in streets and site driveways. The cones and barriers will alert drivers to the presence of a

work area and will provide a clear pathway for traffic to proceed safely.

2.2.5 UTILITIES

Commodore Builders will review subcontractor's information from dig safe findings and will insure all subcontractors comply with dig safe findings.

2.2.5.1 Underground Utilities

A primary initial hazard with excavation operations is contact with underground utilities. Every attempt should be made to mitigate these hazards. Underground utilities will be located by contacting underground service alert and utility services. To mitigate these hazards, the following actions will take place:

Verify the exact location of each authorized excavation with the on-site officials prior to breaking ground;

- Make every attempt to determine the presence or absence of any underground utilities in the region by contacting Dig Safe, and/or local utility services. A private utility service will identify utilities on the property;
- Utilize vacuum excavation to probe area for existing utilities;
- Hand dig to verify location of utilities where contact with utilities is questionable; and
- Arrange for the deactivation of utilities whenever possible and appropriate for the circumstances.

2.2.5.2 Overhead Utilities

The table below indicates the minimum safe clearance in regards to power line voltage. If necessary overhead lines will be insulated if minimum safe clearance cannot be attained. All insulation activities will be performed by the local utility.

Overhead Clearance

Power Line Voltage (kV)	Minimum Safe Clearance (feet)
0-50 kV	10
51 to 200 kV	15
201 to 300 kV	20
301 to 500 kV	25
501 to 750 kV	35
751 to 1000 kV	45

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2.2.6 CONFINED SPACE ENTRY

Commodore Builders will ensure that all aspects of OSHA confined space standards are followed by all personnel. The subcontractors will be responsible for implementation of OSHA confined space procedures. Commodore Builders will review subcontractors confined space procedures to ensure compliance with OSHA regulations.

2.2.6.1 Overview

The Occupational Safety and Health Administration (OSHA) is the federal agency responsible for developing and enforcing these regulations. OSHA has developed a general industry standard for working in confined spaces designated as 29 CFR 1910.146, Permit-Required Confined Spaces. OSHA has also developed regulations promoting the safety of construction workers in confined or enclosed spaces in 29 CFR 1926.21 (Subpart C, General Safety & Health Provisions). Commodore Builders has adopted key provisions of both the general industry and the construction standards and will implement them to ensure the safety and health of its employees when working in confined spaces.

OSHA defines a confined space as a space or area meeting these three conditions:

1. Is large enough and so configured that an employee can bodily enter and perform assigned work
2. Has limited or restricted means for entry and exit; and
3. Is not designated for continuous employee occupancy

After a space has been classified as a confined space then it must be determined if it is a permit-required confined space. OSHA defines a permit-required confined space as a confined space having any one of the four conditions present:

1. Contains or has the potential to contain a hazardous atmosphere
2. Contains a material that has the potential to engulf an entrant (such as sand)
3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; and
4. Contains any other recognized safety and health hazard (such as unguarded equipment or machinery that cannot be locked out).

Commodore Builders will have a designated, competent person that will be responsible for defining what is a confined space and whether that space is permit-required or non-permit-required.

2.2.6.2 Implementation

Potential hazards of confined spaces are lack of oxygen, toxic gases (such as carbon monoxide or

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hydrogen sulfide), combustible gases that could result in ignition or explosion, poor lighting, and difficult entry and/or exit. Additional hazards are possible if activities of other contractors impact the space to be entered.

At a minimum, the following atmospheric conditions need to be met prior to entering a confined space:

1. Oxygen concentration must be between 19.5% - 23.5%. Normal atmospheric oxygen concentration is 20.9%.
2. The concentration of explosive/flammable gases must be below 10% of the lower explosive limit
3. Carbon monoxide concentration must be maintained below 35 parts per million (ppm)
4. Hydrogen sulfide concentration must be maintained below 10 parts per million.
5. Volatile Organic Compounds (VOCs) must be below 15 ppm.
6. Hydrogen Cyanide concentration must be below 3 ppm.

Below is a list of typical safety equipment that may be needed to enter a confined space safely:

- Full body harness and tri-pod for personnel retrieval
- Portable blower for ventilating the space
- Gas detection meter to ensure safe atmospheric conditions
- Radios to ensure proper communication
- Lockout/tagout equipment

Each confined space is different. All or none of the above equipment may or may not be needed to enter a space in a safe manner. The designated, competent person will evaluate the space and the circumstances surrounding the entry and will determine what equipment is necessary. Equipment that is not listed above may also be necessary. This list serves only as a guide for the most common equipment.

2.2.6.3 Training

Competent person: The site personnel designated as the competent person for confined spaces will be trained in the hazards of confined spaces, limitations of air testing equipment, the use of air testing equipment, current OSHA Permit-Required Confined Space Standards (29 CFR 1910.146) and have knowledge of general construction health and safety regulations.

Entrants: The entrants will be trained in the general hazards that confined spaces present to workers, necessary precautions to be taken, and in the use of required protective and emergency equipment. They will also be trained in procedures to properly assess the hazards present in a confined space. An overview of the OSHA standard (29 CFR 1910.146) and typical entry requirements will be covered. The roles of the competent person and entrants will be explained to ensure employees understand each others responsibilities.

2.2.7 ERGONOMICS

Activities such as those listed below may involve significant ergonomic hazards:

- Handling and moving equipment and supplies
- Equipment maintenance
- Manual handling of awkward items
- Hand shoveling

The following work practices or procedures should be followed to minimize ergonomic problems:

1. Mechanical means of lifting and moving of materials will be used whenever possible.

2. Employees will not lift any material or equipment by themselves that weighs in excess of 50 lbs.

3. Employees shall seek assistance from others if mechanical means for lifting/hoisting are not available and the object to be moved weighs more than 50 lbs.

4. Employees will be trained on proper lifting technique to minimize the risk of back injury.

5. Heavy or awkward items will be moved with an excavator whenever possible.

6. Hand shoveling will only be done in areas or situations where an excavator cannot be used.

2.2.8 MECHANICAL FAILURES

Mechanical failures are possible on all construction projects. To minimize the risk of a mechanical failure incident, inspections of all equipment will be made prior to use. Commodore Builders and all subcontractors will ensure that all equipment is in proper repair prior to use. Preventative maintenance will be executed at an interval that is recommended by the equipment manufacturer. Employees will not utilize equipment that they are not familiar with and have not had instruction on proper and safe use.

2.2.9 SHARP OBJECTS

Sharp instruments and tools are required to carry out many tasks on this project. Sharp objects are dangerous and can cause serious injury. Injuries include cuts, punctures, nicks, scrapes and gashes that can lead to infection and disease.

Prevent injury by following these safety precautions:

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- Select the right tool for the job. Use sharp items only as they were designed. Sharpen cutting tools and knives on a regular basis. Dull blades require more force and may be more likely to slip, cutting the handler
- Wear gloves resistant to punctures, cuts, or moisture. Choose gloves based on the hazards normally expected for the task.
- Let falling objects fall. Don't grab for falling cutting tools, sharp instruments or glassware.
- Store sharp items safely to prevent injury when removing from storage.
- Make sure guards are in place on machinery with cutting blades.
- Sharp items or debris will be removed or laid flat to prevent impalement.

2.2.10 EQUIPMENT REFUELING

When fueling equipment on the job site here are a safety precautions that will be followed:

- Never smoke during refueling operations or refuel near an open flame. Keep a CO_2 (carbon dioxide), or an ABC Dry Chemical extinguisher handy, just in case.
- To prevent a vehicle rolling while being refueled, chock the wheels.
- Before filling the fuel tank, shut off the engine.
- If the tank is near the engine or other hot areas, such as the manifold or muffler, let it cool before refueling.
- If temporary storage of fuel is necessary, the container must be made specifically for storage.
- When transferring fuel from a gas can, mobile tank or fuel truck, keep the spout or nozzle in contact with the fuel tank. As fuel is poured, it can generate static electricity and sparks can ignite the vapors.
- Take care not to spill fuel because it might ignite if it comes in contact with something hot.
- Try not to overfill the tank. If the tank is overfilled and the equipment is in the sun, the fuel can expand and eventually overflow. Leave enough space in the tank to compensate for expansion or tilting.
- After refueling has been completed, be sure all fuel has been drained from the hose and that any spills are cleaned up immediately and reported to the Engineer.
- Prior to refueling ensure that adequate spill response material is present and immediately available.
- Equipment that is transported in the bed of a work vehicle should be refueled by placing the equipment on the ground. If the equipment is housed on a trailer and can't be easily moved to the ground, precautions should be used to insure that the nozzle is in contact with the inlet of the fuel tank. Refueling using a portable container would be better in this case, as the slower the gas pours the less static electricity is generated.

2.2.11 NOISE

The potential for noise exposure during field operations is related to individual equipment operations and adjacent vehicle noise. Noise operations should be identified so that exposures can

be minimized. If it is difficult to communicate without yelling when standing 3 feet apart it generally indicates that a noise hazard exists. Hearing protective devices should be worn for any extended operations exceeding 85 decibels (dBA weighted scale). When personnel are subjected to sound-pressure levels exceeding the limits specified in the OSHA Noise Standard, feasible engineering controls or hearing protection should be utilized. Ear insert devices must be utilized by the exposed individual. Recognized noise hazard areas should be marked with caution signs indicating both the presence of hazardous noise levels and the requirement for hearing protection.

2.2.12 ELECTRICAL SAFETY

All electrical work must be performed only by trained/qualified personnel. Electricians will not touch, install, or attempt to repair any electrical equipment unless they are fully familiar with it, until it is locked and tagged out, and until they are positive it is safe. All electrical equipment must be installed in such a manner as to be readily and safely accessible to authorized employees to maintain and repair. Such equipment must be guarded by rails, wooden platforms, insulating mats, or electrically non-conductive material wherever necessary. Electrical equipment and wiring must be inspected systematically and documented at regular intervals to ensure a safe operating condition. Defective equipment must be repaired or replaced at once.

All electrical installations, temporary or permanent, must comply with the applicable provisions of the national electrical safety code. Electrical wire, conduit, apparatus, and components of equipment must be approved or listed by the Underwriters Laboratories, Inc., or factory mutual laboratories, for the specific application. Extension cords must be 3-wire grounded type listed by the Underwriters Labs, Inc. The rated load must not be exceeded

All 115-, 120-, and 220-volt, single-phase receptacle outlets used for construction operations must be protected by a Ground Fault Interrupter (GFI) program.

Underground utility hazards must be marked/evaluated prior to any digging or drilling. Equipment will be kept at a minimum of 10 feet from overhead electrical lines. Dig Safe must be notified 72 hours before any excavation to mark public utilities.

2.2.12.1 Guarding

Live parts of electrical equipment operating at 50 volts or more must be guarded against accidental contact. Guarding of live parts must be accomplished as follows:

- Location in a cabinet, room, vault, or similar enclosure accessible only to qualified persons.
- Use of permanent, substantial partitions or screens to exclude unqualified persons.
- Location on a suitable balcony, gallery, or platform elevated and arranged to exclude unqualified persons
- Elevation of eight feet or more above the floor
- Entrance to rooms and other guarded locations containing exposed live parts must be marked with conspicuous warning signs forbidding unqualified persons to enter

- Electrical installations that are over 600 volts and that are open to unqualified persons must be made with metal enclosed equipment or enclosed in a vault or area controlled by a lock. In addition the equipment must be marked with appropriate caution signs.

2.2.12.2 Grounding of Equipment Connected by Cord and Plug

All noncurrent carrying parts of electrical equipment must be grounded or have an approved double insulated setup. Grounding circuits must have enough capacity to carry all of the currents likely to be imposed upon it.

2.2.12.3 Testing

1. All electrical work, installation and wire capacities must be in accordance with pertinent provisions of the NEC, ANSI, and OSHA standards.
2. All tools cords, and power sets must be inspected prior to use and periodically as necessary.
3. All electrical tools and extension cords found to be defective must be removed from service immediately.

2.2.12.4 Temporary Wiring

1. All necessary open wiring must be made inaccessible to unauthorized employees and visitors. Lighting on barricades, fences, or sidewalk coverings must be encased in metal raceways. Temporary lighting must have guards to prevent accidental contact with the bulb unless the bulb is deeply recessed in the reflector. Temporary lighting must not be suspended by the cord unless the fixture was specifically designed in that manner.
2. Extension cords used with portable tools must be of a heavy duty 3-wire type. Flat extension cords are prohibited. Damaged electrical cords must not be used.
3. All extension cords must be suspended seven feet above finish floor or work platform. Extension cords must not be fastened with staples, hung from nails or suspended by non-insulated wire.
4. All temporary power panels must have covers installed at all times. All open or exposed breakers spaces must be adequately covered or labeled.
5. All electrical equipment and wiring in hazardous locations must conform to the NEC. The frames of all cutting/welding machines must be grounded.
6. Fish tape or lines made of metal or any other conductive material are prohibited. Nonconductive tapes and lines will be used in their place. All temporary wiring must be effectively grounded in accordance with the NEC 305 and 310. All wiring used for temporary lighting must be nonmetallic sheathed cable (NM) or the equivalent.

2.2.12.5 Ground-Fault Circuit Interrupters

1. Commodore Builders and their subcontractors will use approved ground-fault circuit interrupters for all 120-volt, single-phase, 15 and 20 ampere receptacle outlets on construction

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sites, which are not a part of the permanent wiring of the building or structure, and which are in use by their employees.

2. Receptacles on the ends of extension cords are not part of the permanent wiring and therefore, must be protected by GFCIs whether or not the extension cord is plugged into permanent wiring.
3. These GFCIs monitor the current-to-load for leakage to ground. When this leakage exceeds 5mA +/- 1 mA, the GFCI interrupts the current. They are rated to trip quickly enough to prevent electrocution.
4. Commodore Builders will insure that all Commodore Builders GFCI are periodically inspected and keep records of such inspection. Subcontractors are responsible for inspection and recordkeeping of their GFCI.

2.2.13 SLIPS, TRIPS, AND FALLS

The potential for slips, trips, and falls is present on all construction projects. To prevent such hazards work zones will be kept neat and in an orderly conditions. Materials, supplies, and tools will be stored in an orderly manner and will be kept out of the general walking pathways. Excavations will be marked to provide visual indication of their presence.

Tripping hazards will be identified and removed or marked as applicable.

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2.3 ACCIDENT PREVENTION

Recognized site hazards and an evaluation of potential dangers are presented. Both general guidelines and specific actions within this plan are designed to provide a safe workplace, as well as to safeguard the surrounding community.

It is the policy of the Commodore Builders and the subcontractors involved that every employee at the site is entitled to a safe and healthful place in which to work. This is the basic concept that guided the development of this Health and Safety Plan, and which will be carried into its implementation, maintenance, and enforcement throughout the project.

Realizing the objectives of the Health and Safety Plan require the following actions be taken:

A. Training of all employees involved with hazardous waste operations will consist of 40 hours of classroom training covering all aspects of the Health and Safety Plan. This will be followed by an additional 24 hours of supervised field training. All classroom training will be completed prior to the initiation of site operations. An annual 8-hour refresher training is also required for all employees that are involved in contaminated soil work.

B. All employees involved with construction work on this project will at least have OSHA 10 Hour Construction Safety Training. Documentation that supersedes 10 hours of construction safety training will be accepted (e.g. college degree in safety, 30 Hour Construction Safety Course).

C. Safety briefings will be held by the Superintendent\Site Safety Officer before work on a daily basis. Observations of compliance with standard operating procedures, the results of area monitoring, and progress in the implementation of the Health and Safety Plan will be discussed. Additional meetings will be held as needed in response to emergency or near miss occurrences, changes in procedures or site conditions, or uncharacteristic air monitoring results.

D. Fire prevention and protection training will be included in safety training as outlined in the Emergency Response Section of this plan.

E. A First Aid station will be maintained onsite and arrangements made with a hospital to provide emergency medical response services in case of an emergency as outlined in the Emergency Response Plan and Contingency Plan. Lawrence Memorial Hospital will be used for this project.

F. Personal Protective Equipment will be maintained in a state of instant readiness according to the procedures and schedules outlined in the Personal Protective Equipment (PPE) Section of this plan.

G. Maintain good housekeeping and sanitation as an integral part of accident prevention and

health preservation.

H. Safety training and standard operating procedures will be continually reviewed and updated to ensure a high level of safety for every phase of the operation.

I. Constant promotion of safety will be an important aspect of all site work.

J. All employees will be required to report even minor accidents to the Superintendent\Site Safety Officer who will document each incident as referred to in the Site Safety Procedures Section of this plan. The Superintendent\Site Safety Manager will notify the field engineer who will then notify the owner.

Commodore Builders will collect all subcontractor training documentation prior to them arriving onsite. No workers will be allowed to work on this project until all training documentation has been received by Commodore Builders. Training records will be maintained onsite and will also be submitted to the Engineer.

All subcontractors performing work on this project will submit task specific Job Hazard Analysis (JHA) documents to Commodore Builders. Subcontractor submittal of JHAs is a requirement for all Commodore Builders Projects. The Commodore Site Safety Manager will review the submittals and reject if they are not detailed enough or do not meet minimum safety and health standards.

Prior to tasks commencing onsite a meeting with the subcontractors, Commodore Safety and Superintendent will be held. A review of the submitted JHA will be done, and adjustments will be made, as needed, to ensure current work outlook and site conditions are addressed. The final JHA will be signed off by the Subcontractor and the Commodore Site Safety Manager.

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3.0 STAFF SAFETY ORGANIZATION, QUALIFICATIONS AND RESPONSIBILITIES

3.1 PROJECT EXECUTIVE

Michael Dupuis will be the Project Executive for this project. He will have overall responsibility for the day to day onsite activities. Michael will be responsible for ensuring that worker safety and health requirements are being met and appropriate tools and materials are available onsite.

3.2 SITE SUPERINTENTDENT

John Maffei will be the Site Superintendent. He will have responsibility for the day to day field activities and ensuring compliance with construction safety regulations. He will coordinate all site activities, including scheduling of Subcontractors. The Site Superintendent reports directly to the Project Manager. John will work in a safe manner and be a role model for other employees on the site. John will be responsible for ensuring that all personal protective equipment is worn and proper decon procedures are followed.

3.3 SAFETY MANAGER

Peter Duda will be the Project Safety Manager. Peter will ensure that all subcontractors coming onsite have the required training prior to starting work on this project. He will work with the Project Executive, Site Superintendent and Site Industrial Hygiene Officer to ensure that provisions in this Plan and other applicable OSHA Regulations are recognized and complied with. Peter will also coordinate and ensure all subcontractors are prepared and are performing work in a safe manner. Preparation will include performing a Job Hazard Analysis of upcoming tasks.

3.3 SITE INDUSTRIAL HYGIENE OFFICER

Nico DiCarlo will be the Site Industrial Hygiene Officer (SIHO) for this project. He will perform the required air monitoring, ensure that the instrumentation is in proper working order and will calibrate each instrument on a daily basis. Daily air monitoring reports will be completed and submitted to the Certified Industrial Hygienist. Nico will assist the Superintendent with ensuring that all personal protective equipment is worn and proper decon procedures are followed.

3.4 CERTIFIED INDUSTRIAL HYGIENIST

Michael Cashins is the project CIH and has developed this HMH&SP and is responsible for all plan revisions. The CIH will communicate with the Site Industrial Hygiene Officer and discuss site operations and air monitoring results. The SIHO will send air monitoring reports for the CIH to review on a daily basis. After review the CIH will send to the air monitoring reports to the Commodore Builders Project Manager. He will communicate with the Project Team to ensure that provisions of this plan are understood and implemented as intended.

4.0 TRAINING

4.1 OSHA HAZWOPER TRAINING

Prior to beginning onsite operations at this site all workers who are exposed to or come in direct contact with contaminated materials shall receive forty (40) hours of health and safety training for hazardous waste site operations as required by OSHA 29 CFR 1926.65. In addition, supervisors shall receive eight (8) hours of supervisory safety training for managing hazardous waste operations. Once in the field, workers shall have at three (3) initial days of direct supervision under a trained, experienced supervisor, and the Superintendent\Site Safety Manager including a safety meeting "toolbox talk" prior to each day's activities to outline upcoming operations and safety requirements for managing hazardous waste operations. All workers who perform activities in contaminated areas of the site other than the support zone shall receive 8 hours of refresher training annually to meet the requirements of 29 CFR 1926.65.

4.2 OSHA 10 HOUR CONSTRUCTION TRAINING

All workers on this project must have OSHA 10 Hour Construction Training. This is a minimum training course on OSHA Construction Regulations. Employees that have further construction safety training such as the OSHA 30 Hour Construction Safety Course or a college degree in safety and health do not need the OSHA 10 course.

4.3 SITE ORIENTATION

All onsite workers, including those in non-contaminated areas or those workers close to these areas but not in direct contact with contaminated materials, shall attend an initial site orientation meeting and periodic briefings which includes training on hazard recognition, response to emergencies (Emergency Response Plan procedure), explanation of site activities, procedure for obtaining safety supplies, identification of key safety personnel, explanation of decontamination procedures, and all aspects of the Hazardous Materials Health & Safety Plan.

4.4 OTHER TRAINING

In addition, more specific training requirements may need to be provided. These may include, but are not limited to, 29 CFR 1910.95 Occupational Noise Exposure, 29 CFR 1910.134 Respiratory Protection, 29 CFR 1910.1200 Hazard Communication and requirements for compliance with Massachusetts Right to Know laws.

4.5 PERIODIC TRAINING

Follow-up training shall be provided by the Superintendent or Site Safety Manager prior to each change in operations. This training will address personal protective equipment use and maintenance, physical safety from machinery, protection from chemical hazards, decontamination procedures, protection from heat/cold stress and specific safety requirements for new operations.

4.6 VISITOR TRAINING

The Superintendent or the Site Safety Manager shall be responsible for training site visitors, informing visitors of site hazards, assuring visitors read and sign the HMHSP, explaining emergency procedures, and instructing them in the use of personal protective equipment required during the site visit.

4.7 RECORDS

A record of all training sessions, including content, duration, instructors, attendance, and verification "signature page" of all personnel who read the HMHSP and attend these sessions will be maintained in the Commodore Builder's field office. These records shall be available for review by appropriate individuals of agencies.

Commodore Builders will gather training certificates from subcontractors prior to work commencing on the project. Training records will be maintained onsite and will be readily available to the Engineer or Regulatory Agencies.

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5.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

5.1 GENERAL

Appropriate personnel safety equipment and protective clothing will be worn by all onsite personnel who require access to the exclusion zone. Access to the exclusion zone is limited to Contractor/Superintendent/Site Safety Manager approved 40-hour OSHA trained personnel.

5.2 PROTECTIVE EQUIPMENT TYPES

Personal protective equipment will be provided for respiratory protection, skin protection, head protection, foot protection, eye protection and hearing protection. This equipment shall meet all the requirements of the OSHA Standards (and any applicable ANSI standard) as follows:

OSHA STANDARDS FOR PPE USE

Types of Protection	Regulation
General	29 CFR Part 1910.132
Eye and Face	29 CFR Part 1910.133 (a) 29 CFR Part 1926.102
Noise Exposure	29 CFR Part 1910.95 29 CFR Part 1926.52
Respiratory	29 CFR Part 1910.134 29 CFR Part 1926.103
Head	29 CFR Part 1910.135 29 CFR Part 1926.100
Foot	29 CFR Part 1910.136

5.3 PERSONAL PROTECTIVE EQUIPMENT LEVELS

Upgrade and downgrade "action levels" from the specified minimum levels of protection will be established by the CIH. Any upgrade or downgrade of PPE will be determined by the CIH with notification to the Project Engineer.

5.3.1 Level D (General Site Areas)

ANSI Class II Reflective Vests

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Work gloves

Hard hats

Safety goggles or safety glasses

Chemical resistant work boots

Rubber overboots

5.3.2 Level D Modified (Minimum for Exclusion Zone Work)

ANSI Class II Reflective Vests

Chemical resistant coated Tyvek disposable coveralls

Butyl chemical resistant gloves

Outer work glove (optional)

Hard hats

Safety goggles or safety glasses

Chemical resistant rubber overboot or steel toed rubber boot

5.3.3 Level C (Contaminants other than Hydrogen Cyanide)

This Level of Protection is not anticipated on this project.

Full face air purifying respirator (P100 and VOC Combination Cartridge)

ANSI Class II Reflective Vests

Chemical resistant coated Tyvek disposable coveralls

Butyl chemical resistant gloves (taped to Tyvek)

Outer work glove (optional)

Hard hats

Chemical resistant rubber overboot or steel toed rubber boots

5.3.4 Level B

This Level of Protection is not anticipated on this project.

Full face airline respirator

ANSI Class II Reflective Vests

Saranax suit

Butyl chemical resistant gloves

Outer work glove (optional)

Hard hat

Chemical resistant rubber overboot or steel toed rubber boots

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5.4 GENERAL PPE REQUIREMENTS

5.4.1 Safety Goggles. Safety goggles to be used on the site will be constructed of a minimum of 0.060" thick acetate lens (fog free) which is seated to allow flexing, have indirect vents for unobstructed side vision, be of light weight design to fit over prescription glasses and meet ANSI Z87.1-1989 standards

5.4.2 Hardhats. Hardhats to be used on the site will be constructed of high density non-conductive polyethylene with adjustable four point headgear suspension, have a visor with rain trough outer rims, and meet ANSI Z89.1-1986 Class A,B,C, standards.

5.4.3 Tyvek. Tyvek coveralls to be used on the site will be constructed of polylaminated material to repel water and moisture, and provide a strong chemical resistant barrier.

5.4.4 Gloves. Butyl gloves to be used on the site as an outer glove will be constructed of a case hardened finish to repel chemical and resist punctures, and have an embossed tread grip on the fingers and palms to prevent slipping.

5.4.5 PVC Rain/Splash Suit. PVC rain/splash suits will be made available onsite in the event of rainy weather or emergency response actions to a hazardous spill/release incident. PVC rain/splash suits will be constructed of at least 20 mil thick PVC material with welded seams; have an attached hood which can fit over a hard hat; and be of a two piece design with adjustable elastic suspenders, take-ups at wrists and ankles.

5.4.7 Respirators. Air purifying or supplied air respirators to be used onsite will be of the full face type and constructed of either rubber or silicone. All onsite personnel who require prescription glasses to correct vision shall be provided with respirator eye glass lens kits, made by the respirator manufacturer, to be worn while using the respirator. All respiratory protective equipment used on the site will be NIOSH/MSHA approved. All onsite-personnel who will be expected to wear a respirator shall first meet the training and medical requirements of 29 CFR 1910.134 (OSHA) and ANSI Z88.2

5.4.8 Reflective Vests. High visibility reflective vests worn onsite will be constructed of polyester or mesh and be ANSI Level 2 compliant.

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6.0 MEDICAL SURVEILLANCE

6.1 GENERAL

An annual medical surveillance program will be required for employees whose work description fits the following criteria:

- Employees who are or may be exposed at or above the permissible exposure limit without regard to the use of respirators, for 30 days or more a year.
- Employees who wear a respirator for 30 days or more a year.
- All employees who are injured, become ill or develop signs or symptoms due to a substance overexposure from a hazmat operation.

The frequency of medical examinations shall be determined by the occupational physician. The following is a typical frequency of medical testing: prior to site assignment, once every 12 months thereafter, at termination of employment or reassignment to an area where an exam must be up to date within the past six months.

6.2 MEDICAL PARAMETERS

The medical examination shall also include a medical and occupational worker history. The physical examination will be designed by an occupational physician. The medical surveillance program shall meet the requirements of OSHA Standard 29 CFR 1910.120 (F). The entire medical surveillance program shall meet the requirements of OSHA Standard 29 CFR 1926.65 (f), including obtaining the physician's written medical opinion based on site specific information.

The following types of contaminants and physical hazards will be considered.

Noise
Heat Stress
Volatile Organics
Lead

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6.3 RECORDS

In accordance with 29 CFR 1926.65, the Site Safety and Health Officer will maintain copies of all physician signed “fit to work” forms and all medical surveillance records for review. This "fit to work" form shall include ability to wear respiratory protective equipment. Copies shall also be maintained at the corporate office.

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7.0 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

The exposure monitoring criteria used in this plan was based upon data developed by others which show the level of chemical contamination in the soil. Relevant soil data is attached as Appendix A.

All air monitoring equipment shall be maintained and calibrated according to NIOSH analytical methods or manufacturers' recommendations, whichever is more stringent. Real-time monitoring equipment shall be calibrated and/or calibration checked daily. All maintenance and calibration data shall be recorded and included in the Cashins & Associates, Inc.'s Project record documents.

7.1 INHALATION

The chemicals of concern which have a potential to be airborne as vapors, gases or dust during site work include volatile organics, semi-volatile organics, and naphthalene. Permissible Exposure Limits (PELs) and Short Term Exposure Limits (STELs) established by OSHA for inhalation are listed in Table 1, Threshold Limit Values-Time Weighted Averages (TLVs-TWAs) established by the American Conference of Governmental Industrial Hygienists (ACGIH), and harmful effects for these chemicals are also listed in Table 1. The lower of the two values (PEL/TLV-TWA) will be used for worker exposure monitoring during site remediation work. The OSHA PELs and STELs and /or ACGIH TLV-TWA for inhalation will not be exceeded at any time during site work.

Air monitoring of these gases and vapors on-site will be performed using direct reading portable gas analyzers and/or detectors and TWA air sampling equipment.

TABLE 1
EXCLUSION ZONE WORKER INHALATION EXPOSURE GUIDELINES

COMPOUND	OSHA PEL	OSHA STEL	ACGIH TLV-TWA	NOTATIONS	HARMFUL EFFECTS
Total Chromium	0.5 mg/m^3		0.5 mg/m^3 (I)	---	Resp tract irr
Hexavalent Chromium	0.005 mg/m^3		0.0002 mg/m^3 (I)	A1; Skin; DSEN; RSEN	Lung & sinonasal cancer; resp. tract irr; asthma
Lead	0.05 mg/m^3		0.05 mg/m^3	A3; BEI	CNS & PNS impair; hematologic eff
Zinc	---	---	---	---	Skin irr
Cyanide	5 mg/m^3	---	---	Skin	Irr-Eyes, Nose, Throat, Skin
Petroleum Hydrocarbons	200 ppm	---			Liver, cancer
Napthalene	10 ppm		10 ppm	Skin; A4	URT irr; cataracts; hemolytic anemia

A1: Confirmed Human Carcinogen
A2: Suspected Human Carcinogen
A3: Confirmed animal carcinogen with unknown relevance to humans.
A4: Not Classifiable as a Human Carcinogen
A5: Not Suspected as a Human Carcinogen

NOTE: The OSHA/ACGIH Exposure Guidelines listed above only apply to workers onsite. The levels are not intended for exposure by the general public.

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7.2 SKIN ABSORPTION AND EYE CONTACT

Various volatile and semi-volatile organics can either irritate or can be directly absorbed by skin and/or eye contact. Protective clothing and equipment will be utilized by on-site personnel if exposures exist.

7.3 DOCUMENTING BASELINE AIR QUALITY CONDITIONS

Baseline (background) air quality conditions will be evaluated prior to start-up of site remedial activities. The SIHO will scan the area with a photoionization detector to check the ambient background. Real time dust measurements will also be collected.

7.4 DOCUMENTING REMEDIAL ACTIVITY AIR QUALITY CONDITIONS

Air monitoring of active work zones and the work area perimeter will be done on a daily basis. The exclusion zone monitoring will consist of both real time testing for volatile organics and total dust.

7.4.1 Real Time Onsite Limits (VOCs, Respirable Dust)

The following real time onsite limits have been established for the exclusion zone and exclusion zone perimeter based upon the site contaminants of interest. Level C or B protection will be required if these limits are exceeded. An exceedance is defined as readings over a real time onsite limit on 2 consecutive readings taken 15 minutes apart or if the real time onsite limit is exceeded 3 times in one 8-hour shift.

Volatile Organics using a PID (10.2 EV lamp) – Worker Breathing Zone 15 ppm

Respirable Dust – Worker Breathing Zone 0.30 mg/m^3

Table 2 and 3 summarize the air monitoring and PPE requirements in the exclusion zone and at the exclusion zone perimeter.

7.4.2 Real Time Off-Site Limits

The following limits have been established to minimize the release of site contaminants to areas outside the owner's property. A site-specific PM10 dust limit has been established in the Release Abatement Measure (RAM Plan) that was submitted to the Massachusetts DEP.

PM10 dust – 24-hour Average 102 $\mu g/m^3$

There is also the potential to encounter Volatile Organic Compounds during soil handling activities. The following perimeter VOC limit will be established to ensure that chemical vapors do not impact off-site receptors.

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Volatile organics using a PID (10.2 eV lamp)	5.0 ppm

7.4.3 Real Time Monitoring

Work Zone

Real time monitoring will be done within the active work zone The frequency of real time air monitoring at the active work zone will adhere to the following schedule:

Site Limit	Monitoring Frequency
0-25%	1/hour
25-50%	2/hour
50-75%	4/hour
>75%	continuous

If real time readings exceed 50% of the site limit at the exclusion zone boundary or in the working breathing zone consistently over a one-minute cycle while work is going on, the Commodore Builders Company, Inc.'s project manager or his representative will be notified, and steps will be taken to reduce the exposure level. Work will be halted if the readings reach any of the site limits (as described in Section 8.4.1), until the exclusion zone can be expanded and Level C or B protection provided.

Perimeter Monitoring

7.4.4 Dust and Vapor Monitoring and Response

Four perimeter air monitoring stations will be established at the site perimeter and will be operating continuously. The stations will monitor PM10 dust level for 24 hours a day, 7 days per week during this contract. Reports summarizing the 24 hour PM10 dust average will be submitted the following day by 10am.

Commodore Builders will have a separate Project Dust and Vapor Control Plan to specifically respond to dust and odors that may be encountered during this work. The plan will address keeping dirt/dust off of streets and other site-specific control measures that will be taken during the course of this project work. The following basic responses will be initiated when monitoring by Cashins & Associates indicates action limits are being approached.

If any airborne project criteria (exclusion zone or site boundary) established for this project is exceeded then a corrective response as described below will be required immediately. The corrective responses will be implemented when air monitoring data indicate that airborne contaminants consistently exceed 50% of the site criteria (action limit). The response is intended to minimize the possibility of an exceedance. The following steps will be taken if the air monitoring data indicates a dust or total vapor concentration that is greater than 50% of the established site criteria. Immediately upon exceeding the action levels established, the Commodore Builders shall

implement the following vapor control and/or dust suppression measures, as necessary.

Commodore Builders shall notify the Engineer immediately when hourly monitoring indicates an exceedance of the action levels.

- Report reading.
- If levels are still elevated, investigate the source and notify the Project Engineer.
- If source can be identified, take corrective action which would include.
  - Wetting down dry areas.
  - Covering side of open excavations.
  - Altering work practices such as height from which excavated soil is dropped, reduce the number of pieces of heavy equipment working in the same area.
- Collect upwind and downwind air monitoring data.
- Increase controls if air concentrations still elevated or maintain controls if air concentrations are reduced to an acceptable level (<50% of site criteria).
- Reduce the area of exposed excavation.
- Modify work schedule.

If the dust or vapor levels exceed the criteria during the next hourly reading and the controls are not effective, then the Engineer will be notified and the activities thought to be causing the exceedance will be shut down. Work will not commence until an effective dust/vapor control strategy has been developed and acknowledged by the Engineer.

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TABLE NO. 2
EXCLUSION ZONE AIR MONITORING

Contaminant	Activity	Level D – Modified	Level C (action level)	PPE	Monitoring Equipment	Frequency	Duration	Corrective Action
Respirable Dust	excavation, trenching, decontamination	<0.30 mg/m^3	>0.30 mg/m^3	1,2,3,4	MIE PDR-1000	**	5 min.	A,B,C,E
VOCs	excavation, trenching, dewatering, decontamination	<15 ppm	>15 ppm	1,2,3,5	RAE PID	**	5 min.	C,D,E,F

PPE:

1 = Tyvek
2 = Butyl Gloves
3 = Rubber Overboots
4 = Respirator with Toxic Dust Cartridges
5 = Respirator with Organic Vapor Cartridges

* D.T. = Drager Detector Tube

** 0-25% of action level 1/hour
25-50% of action level 2/hour
50-75% of action level 4/hour
>75% of action level continuous

Corrective Action:

A = Wet Surfaces
B = Calcium Chloride
C = Work Practice Changes
D = Vapor Control
E = Barriers
F = Stop work and re-evaluate project procedures

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TABLE NO. 3
EXCLUSION ZONE PERIMETER AIR MONITORING

Contaminant	Activity	Monitoring Equipment	Frequency	Duration	Action Level	Corrective Action
PM10 Dust	Excavation, trenching, decontamination	4 Perimeter Stations	*	24 hours	102 $\mu g/m^3$	A,B,C,E
Volatile Organics	Excavation, trenching, decontamination	RAE PID	*	15 min.	5 ppm	C,D,E

Corrective Action:

A = Wet Surfaces
B = Calcium Chloride
C = Work Practice Changes
D = Vapor Control
E = Barriers

See Site Specific Dust and Vapor Control Plan for detailed site dust preventative control measures and responses

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7.5 TWA MONITORING

TWA monitoring will not be performed unless certain conditions are encountered. The following sampling schedule will be followed:

- Whenever real time monitoring indicates the worker's exposure potential is consistently greater than 50% of the site PEL.

- Whenever employees exhibit symptoms which suggest an adverse effect from site activities.

7.6 RECORDS

The SIHO will record and log all real time data as to location, time, type of monitoring equipment, and value of each reading. All readings above the established criteria will be reported immediately to the project Engineer. All real time data will be provided to the Commodore Builders on a daily basis.

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8.0 STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES

Site preparation, onsite construction and excavation will require work in a potentially hazardous environment which presents physical hazards as well as chemical hazards. Site specific standard operating safety and health procedures must be established by the Commodore Builders Standard Operating Procedures/Work Practices and Engineering Controls are included in Appendix B.

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9.0 SITE CONTROL MEASURES AND OPERATIONS PLAN

9.1 SITE WORK ZONES

Work zones will be established on this site as described in Chapter 9.0 of the technical guidance publication "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" (NIOSH 85-115). Upon initial entry onto the site, areas of restricted access will be established. Simultaneously, an administrative area will be established at the site. Site access points will be established to prevent uncontrolled site access. Site workers will be allowed to travel in all other areas other than the restricted access areas. Site visitors will be restricted to the administrative support area unless they are authorized by the Project Manager to enter the site work area. The site work area zones will include exclusion zones contamination reduction zones and a support zone.

Work area exclusion zones will be established in areas where intrusive work is to be performed in areas of known contamination which have been identified in the specification. The work area exclusion zones will be in addition to the site wide exclusion zone. The SIHO will determine the size of the zone based upon the work being performed and the contamination level in the soil. The contamination reduction zone will be modified as described in Section 10.1.2. The zones will move as the work progresses. Decontamination methods are outlined in Section 12.

9.1.1 Site Wide Exclusion Zone. A site wide exclusion zone will be set up. The initial minimum level of personal protective equipment required in this zone shall be in accordance with these specifications and as determined by the CIH and SIHO after monitoring and on-site evaluation. Level D PPE as outlined in Section 6.3.1 will be required upon entering the site wide exclusion zone.

9.1.2 Work Area Exclusion Zone. If work is done in a specific area of the site where workers may come in direct contract with contaminated soil, such as a catch basin excavation area, then a work area exclusion zone will be established by the SIHO and, as a minimum, Level D Modified PPE as outlined in Section 6.3.2 of this plan will be required.

9.1.3 Contamination Reduction Zone. A decon corridor at the edge of each exclusion zone will be established to insure proper personnel and equipment decontamination. Gross decontamination activities will be performed in this area for all personnel and all equipment leaving the Exclusion zone.

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9.1.4 Support Zone. The support zone will be established onsite and is defined as the area outside the zone of significant contamination where site remedial activities will not be occurring. The support zone shall be used to store clean equipment, take work/rest breaks, and serve as an observation location for "onsite personnel" and "visitors" who do not meet the 29 CFR 1910.120 training and medical requirements. This zone shall be clearly delineated and shall be secured to prevent the transport of contaminants from the exclusion zone.

9.2 IDENTIFICATION AND CONTROL

A system of identification and control for personnel and equipment entering and exiting the site will be established. All visitors must sign in at the work project office before approaching the work area.

9.3 SITE GENERATED WASTE

9.3.1 Decontamination Rinsate (Waste Water). Waste water from the personnel and equipment decontamination shall be collected onsite. The water will be disposed of as required by the Project Engineer or will be sent to the onsite treatment system.

9.3.2 Contaminated PPE. Contaminated PPE shall be collected and disposed of as required by the Project Engineer.

9.4 SIGNS AND BOUNDARY MARKING

Safety signs and boundary markings will be posted on the site. Safety signs will include but not be limited to the following:

No Smoking;
Exclusion Zone, Authorized Personnel Only;
Visitor Direction to the Field Office/Security Office.
Traffic Control Signs

9.5 SITE CONTROL METHODS

The project Superintendent and SIHO will be responsible for site control at all areas where contaminated materials are handled. Each area will be inspected daily to determine if the work zones are properly marked, signs are in place, and procedures for entry and exit are followed. Truck routes will be identified and maintained at all times. Excavated soil will be staged in a designated soil stockpile area. The Resident Engineer will be notified if the required controls are not properly maintained.

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At the conclusion of work in any area, the Superintendent and SIHO will inspect the area to ensure that the site has been returned to its original condition. The methods used to insure the return of an area to its original condition will include the following:

- Superintendent will insure that all work in the area has been completed.

- Superintendent and SIHO will inspect the area to determine that:

    - All fencing and jersey barriers are void of contamination and removed from site;
    - All equipment and materials have been thoroughly decontaminated before leaving site;
    - Any exposed contaminated soil has been covered with clean soil or asphalt;
    - All drummed debris have been removed and disposed of properly;
    - Trash and other imported materials have been collected and disposed of as solid waste;
    - All used PPE has been disposed of as contaminated waste;
    - All portable bathroom facilities have been removed from site;
    - Trailers and moveable offices have been removed;
    - All signs and notifications have been removed;
    - Barrier fencing is removed in a manner such that the Exclusion Zone fencing is taken down last

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10.0 PERSONAL HYGIENE AND DECONTAMINATION

10.1 GENERAL

Decontamination procedures for "on-site personnel" who perform activities in the side wide or work area exclusion zone will be established and strictly enforced. Gross decontamination will be performed at the exclusion zone decontamination corridor. The Commodore Buildersshall provide adequate washing facilities and an adequate supply of potable water for personal hygiene.

The intent of the decon procedures is to prevent site contaminants from leaving the work zone. It is unacceptable for workers to contaminate their personal clothing, work boots, or themselves. By keeping the contaminants onsite we will prevent unintended exposure to family members of site workers, contamination of vehicles or places of residence.

EXCLUSION ZONE ENTRY/EXIT PROCEDURES

Exclusion Zone Entry

1. Walk from support zone into change area.
2. Don required (clean) PPE.
3. Proceed to remote site wide or work area exclusion zone.
4. Perform site work activities.

Exclusion Zone Exit

1. Walk from Exclusion Zone into Contamination Reduction Zone.
2. Perform boot wash activities at boot wash station, and remove outer PPE.
3. Store boots in designated area.
4. Exit into support zone.
5. Wash hands prior to eating and/or smoking.

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11.0 EQUIPMENT DECONTAMINATION PROCEDURES

11.1 EQUIPMENT DECONTAMINATION

All heavy and light equipment which operates in the Exclusion Zone shall be decontaminated before entering the Support Zone. Wash water will be properly collected and disposed of as required by the Project Engineer. Equipment used in the Exclusion Zone need not be decontaminated everyday if that equipment will remain in the Exclusion Zone during its use.

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12.0 HEAT/COLD STRESS MONITORING

12.1 GENERAL

A heat stress/cold stress monitoring program for onsite activities will be developed. This monitoring program shall be consistent with the technical guidelines in "NIOSH Recommended Standard for Occupational Exposure to Hot Environments", Section 9.0 (Heat and Cold Stress) of EPA's "Health and Safety Assurance Manual for Performance of Remedial Response Activities at Uncontrolled Hazardous Waste Sites (EPA Contract No. 68-01-6939)", and the ACGIH "Threshold Limit Values and Biological Exposure Indices (TLV Guide)" for heat stress and cold stress. The heat/cold stress monitoring program will be managed on the site by the SIHO.

12.2 HEAT STRESS

The climate combined with the requirements for personal protective equipment (PPE) may create a heat stress condition. Because of this, monitoring of personnel wearing impervious PPE will commence when the ambient temperature is 70 degrees F or above. The heat stress monitoring frequency shall increase as the ambient temperature increases or slow as recovery rates of workers are observed. The heat stress monitoring will be conducted by monitoring workers heart rates. Body temperature and body weight loss (water loss) monitoring will begin if it is determined by the CIH that the heart rate monitoring is not adequately indicating heat stress conditions. The measurement of pulse rates will follow NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities guidelines.

Break times must be sufficient to allow workers to recover from the effects of heat stress. This will be accomplished by measuring the heart rates of the workers.

The break duration will be determined using the following methodology and criteria:

- Seat person being monitored.
- Measure pulse in the following sequence:
  Pulse #1 - 30 seconds to one minute after sitting
  Pulse #2 - 2.5-3 minutes after sitting

An excessive heat stress condition exists when any of the following exist:

1. If Pulse #2 is greater than 90 beats per minute and
2. Pulse #1 is greater than 110 beats per minute.

Worker cannot return to work until:

1. Pulse rate is below 90 beats per minute.
2. Recovery heart rate for workers with heart rates over 90 beats per minute is less than 10 beats per minute less than the original heart rate.

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If the heart rate does exceed the criteria, the next work period will be shortened by 33%, while the length of rest period will remain the same.

Before commencement of work involving impermeable PPE workers will be encouraged to increase their fluids intake during the day and workers will be trained to recognize the signs and symptoms of heat stress.

12.3 COLD STRESS

When the body is unable to warm itself, cold related stress may result. This may include tissue damage and possibly death. Four factors contribute to cold stress: cold air temperatures, high velocity air movement, dampness of the air, and contact with cold water or surfaces. A cold environment forces the body to work harder to maintain it's temperature. Cold air, water, and snow all draw heat from the body. Wind chill is the combination of air temperature and wind speed. For example, when the air temperature is 40°F, and the wind speed is 35 mph, your exposed skin receives conditions equivalent to the air temperature being 11° F. While it is obvious that below freezing conditions combined with inadequate clothing could bring about cold stress, it is also important to understand that it can also be brought about by temperatures in the 50's coupled with some rain and wind.

Hypothermia

Hypothermia which means "low heat", is a potentially serious health condition. This occurs when body heat is lost faster than it can be replaced. When the core body temperature drops below the normal 98.6° F to around 95° F, the onset of symptoms normally begins. The person may begin to shiver and stomp their feet in order to generate heat. Workers may lose coordination, have slurred speech, and fumble with items in the hand. The skin will likely be pale and cold. As the body temperature continues to fall these symptoms will worsen and shivering will stop. Workers may be unable to walk or stand. Once the body temperature falls to around 85° F severe hypothermia will develop and the person may become unconscious, and at 78°, the person could die.

Anyone working in a cold environment may be at risk for cold stress. However, older people may be at more risk than younger adults, since older people are not able to generate heat as quickly. Certain medications may prevent the body from generating heat normally. These include anti-depressants, sedatives, tranquilizers and others.

Treatment depends on the severity of the hypothermia. For cases of mild hypothermia move to warm area and stay active. Remove wet clothes and replace with dry clothes or blankets, cover the head. To promote metabolism and assist in raising internal core temperature drink a warm (not hot) sugary drink. Avoid drinks with caffeine. For more severe cases do all the above, plus contact emergency medical personnel (Call 911 for an ambulance), cover all extremities completely, place very warm objects, such as hot packs or water bottles on the victim's head, neck, chest and groin. Arms and legs should be warmed last. In cases of severe hypothermia treat the worker very gently

and do not apply external heat to re-warm. Hospital treatment is required.

If worker is in the water and unable to exit, secure collars, belts, hoods, etc. in an attempt to maintain warmer water against the body. Move all extremities as close to the torso as possible to conserve body heat.

Frostbite

Frostbite occurs when the skin actually freezes and loses water. In severe cases, amputation of the frostbitten area may be required. While frostbite usually occurs when the temperatures are 30° F or lower, wind chill factors can allow frostbite to occur in above freezing temperatures. Frostbite typically affects the extremities, particularly the feet and hands. The affected body part will be cold, tingling, stinging or aching followed by numbness. Skin color turns red, then purple, then white, and is cold to the touch. There may be blisters in severe cases.

Do not rub the area to warm it. Wrap the area in a soft cloth, move the worker to a warm area, and contact medical personnel. Do not leave the worker alone. If help is delayed, immerse in warm (maximum 105 °F), not hot, water. Do not pour water on affected part. If there is a chance that the affected part will get cold again do not warm. Warming and recooling will cause severe tissue damage

Trench Foot

Trench Foot or immersion foot is caused by having feet immersed in cold water at temperatures above freezing for long periods of time. It is similar to frostbite, but considered less severe. Symptoms usually consist of tingling, itching or burning sensation. Blisters may be present.

Soak feet in warm water, then wrap with dry cloth bandages. Drink a warm, sugary drink.

Planning for work in cold weather is essential. Wearing appropriate clothing and being aware of how your body is reacting to the cold are important to preventing cold stress. Avoiding alcohol, certain medications and smoking can also help to minimize the risk.

Protective Clothing is the most important way to avoid cold stress. The type of fabric also makes a difference. Cotton loses its insulation value when it becomes wet. Wool, on the other hand, retains its insulation even when wet. The following are recommendations for working in cold environments:

- Wear at least three layers of clothing. An outer layer to break the wind and allow some ventilation (like Gortex® or nylon). A middle layer of down or wool to absorb sweat and provide insulation even when wet. The inner layer should be cotton or synthetic weave to allow ventilation.
- Wear a hat. Up to 40% of body heat can be lost when the head is left exposed.
- Wear insulated boots or other footwear.

- Keep a change of dry clothing available in case work clothes become wet.
- Do not wear tight clothing. Loose clothing allows better ventilation.

Work Practices and planning are important preventative measures. Drink plenty of liquids, avoid caffeine and alcohol. It is easy to become dehydrated in cold weather. If possible, heavy work should be scheduled during the warmer parts of the day. Take breaks out of the cold. Try to work in pairs to keep an eye on each other and watch for signs of cold stress. Avoid fatigue since energy is needed to keep muscles warm. Take frequent breaks and consume warm, high calorie food such as pasta to maintain energy reserves.

Engineering controls can be effective in reducing the risk of cold stress. Radiant heaters may be used to provide warmth. Shielding work areas from drafts or wind will reduce wind chill. Insulating material will be used on equipment handles, especially metal handles, when temperatures drop below 30° F.

Training in recognition and treatment is important. Supervisors, workers and coworkers shall watch for signs of cold stress and will allow workers to interrupt their work if they are extremely uncomfortable. Supervisors should also ensure that work schedules allow appropriate rest periods and ensure liquids are available.

WIND CHILL CHART

Temperature (°F)

Wind (mph)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5		36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10		34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15		32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20		30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25		29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30		28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35		28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40		27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45		26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50		26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55		25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60		25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98
	FROSTBITE OCCURS IN:							30 minutes		10 minutes		5 minutes							

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

T = Air Temperature (°F) **V** = Wind Speed (mph)

Chart Source: National Weather Service Forecast Office, Glasgow, MT

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ACGIH Threshold Limit Values Work/Warm-up Schedule for Four-Hour Shift*

Air Temperature—Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approx.)	°F (approx.)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
–26° to –28°	–15° to –19°	(Norm. Breaks)	1	(Norm. Breaks)		75 min	2	55 min	3	40 min	4
–29° to –31°	–20° to –24°	(Norm. Breaks)	1	75 min	2	55 min	3	40 min	4	30 min	5
–32° to –34°	–25° to –29°	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
–35° to –37°	–30° to –34°	55 min	3	40 min	4	30 min	5	Non-emergency work should cease			
–38° to –39°	–35° to –39°	40 min	4	30 min	5	Non-emergency work should cease					
–40° to –42°	–40° to –44°	30 min	5	Non-emergency work should cease							
–43° & below	–45° & below	Non-emergency work should cease									

Notes for ACGIH Table

1. Schedule applies to moderate to heavy work activity with warm-up breaks of ten (10) minutes in a warm location. For Light-to-Moderate Work (limited physical movement): apply the schedule one step lower. For example, at –35°C (–30°F) with no noticeable wind (Step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period (Step 5).
2. The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph: light flag moves; 10 mph: light flag fully extended; 15 mph: raises newspaper sheet; 20 mph: blowing and drifting snow.
3. If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be: 1) special warm-up breaks should be initiated at a wind chill cooling rate of about 1750 W/m^2; 2) all non-emergency work should have ceased at or before a wind chill of 2250 W/m^2. In general the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart slightly over-compensates for the actual temperatures in the colder ranges, since windy conditions rarely prevail at extremely low temperatures.

*Adapted from Occupational Health & Safety Division, Saskatchewan Department of Labour.

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13.0 LOGS, REPORTS, AND RECORD KEEPING

13.1 GENERAL

Logs and reports covering implementation of the HSP including the Air Monitoring Program will be maintained during the life of the project. The information provided will include training logs, daily activity logs, air monitoring logs, and decontamination logs. Log entries will be performed with non-running ink on one (1) side per page of each log. Log errors shall be crossed with a single-line of ink so that the error can still be read. The error shall then be initialed and dated by the person performing the entry.

13.2 ACCIDENT INVESTIGATIONS

All accidents/incidents will be reported to the Project Superintendent\Project Safety Manager. The contractor's superintendent or designee will arrange for medical assistance and investigate the accident/incident. Commodore Builders will respond and provide assistance to any accident/incident that occurs.

Within 24 hours the Superintendent\Project Safety Manager will ensure a completed Incident/Accident Reporting Form is submitted to the Commodore Builders Project Executive.

Commodore Builders will ensure all subcontractors follow OSHA guidelines for reporting and recordkeeping of accidents and injuries. (ie. OSHA must be notified within 8 hours of fatalities or multiple hospitalizations of 3 or more workers).

Commodore Builders is responsible for obtaining the appropriate medical and emergency assistance, for Commodore Builders personnel.

Except for rescue and emergency measures, the site of the accident/incident will not be disturbed, and work will not resume until it is authorized by Commodore Builders. The Superintendent\Project Safety Manger will assist OSHA in conducting investigations of the accident/incident and will ensure the availability of all information, personnel and data pertinent to the investigation.

Although Commodore Builders will provide for reporting and investigation of all on-site accidents/incidents involving Commodore Builders/or subcontractor personnel, subcontractors will be required to comply with applicable accident reporting/investigating procedures of their own companies.

13.3 INCIDENT REPORTING

All injuries and accidents will be reported promptly to the Superintendent\Site Safety Manager. The Superintendent\Site Safety Manager will insure the completion of all reports and logs.

The Accident Investigation Report will be completed the day of the injury/incident. The report will

be submitted within 24 hours and a copy will be kept on site.

The original will be sent to the main office and filed in the employee's personnel/training file, if applicable. Commodore Builders will also submit the report to the Resident Engineer.

The report will include, but is not limited to:

- Name, organization, telephone number, and location of Commodore Builders
- Name and title of the person(s) reporting.
- Date and time of the incident.
- Location of the incident, i.e., site location, facility name.
- Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident.
- Cause of the incident, if known.
- Casualties (fatalities, disabling injuries).
- Details of any existing chemical hazard or contamination.
- Estimated property damage, if applicable.
- Nature of damage, effect on contract schedule.
- Action taken to ensure safety and security.
- Other damage or injuries sustained, public or private.

Reportable incidents include, but are not limited to:

- Injuries to personnel requiring first aid and/or resulting in lost time;
- Tool or equipment failure which results or could result in serious injury;
- Fire or explosion of any magnitude;
- Exposure of unprotected personnel to toxic agents
- Vehicle accidents;
- Any injuries to authorized visitors; and
- Any damage to private property.

All injuries/illnesses, no matter how minor they appear, are to be reported to the Site Superintendent. The incident will be logged and properly reported.

Under no circumstances will an injured employee drive himself/herself to the hospital, clinic, etc. An employee with minor injury may be transported by car after first aid treatment is given. The Superintendent\Site Safety Manager or other project management personnel will transport the injured person to the hospital. When the injury is severe, or when in doubt concerning the severity of injury, the employee will be transported by ambulance. Project management personnel will accompany the injured employee.

Injured employees that require medical treatment or are taken to a doctor, hospital, clinic, etc., will not be allowed to resume work without a written return to work statement from the treating

physician. This statement should supply a medical diagnosis of the problem, the date of return to work, and work limitations. Should a statement such as "light duty" be given, the treating physician will be called to determine the exact restriction that is needed. The treating physician will be informed of the type of work the employee normally performs and that alternate work is available to meet work restrictions.

13.4 OSHA 300 LOG

The OSHA 300 Log will be kept at the job site. All recordable injuries, with the exception of first aid cases, are to be logged as required by OSHA. In accordance with OSHA regulations, minor injuries that require first aid treatment only, such as small cuts, scrapes, small first degree burns, and splinters, will not be recorded on the OSHA 300 Log. Any incident that requires the completion of the Incident Investigation Report as described above will be logged. The original OSHA 300 Log will be retained in site records.

13.5 DAILY SITE SAFETY REPORT

The Daily Air Monitoring Summary Report submitted by the SIHO will include:

- Weather conditions (including general weather, temperature, wind direction and speed);
- General description of work activities;
- General description of air monitoring locations (including a figure);
- Summary of volatile organic compound (VOC) and particulate concentrations (including typical values, maximum 15-minute averages, maximum absolute values, and background conditions);
- Identify action level conditions (if any);
- Description of response actions (if any); and
- Documentation of odor complaints received by on-Site or off-Site receptors if any) and associated response actions. Document the date, time, entity filing the complaint, affected location, nature of on-Site work preceding the complaint, and a
- description of the response action implemented and the outcome.

The Daily Safety Report submitted by the Superintendent will contain the following items:

- Summary sheet covering range of work accomplished during the day;
- Safety inspection report copies;
- Instances of job-related injuries and illnesses;
- Copies of correspondence;
- SUPERINTENDENT\SITE SAFETY MANAGER signature and date

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13.6 WORK PERMIT REQUIREMENTS

Copies of Work permits will be kept on site for any excavation, hot work, confined space, etc. Subcontractors shall furnish copies to the Superintendent\Site Safety Manager.

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14.0 EMERGENCY EQUIPMENT & FIRST AID REQUIREMENTS

14.1 FIRST AID & FIRE

Emergency eye wash units in accordance with ANSI Z358.1, a first aid kit, and dry chemical fire extinguishers with a minimum rating 2A-10 B:C will be provided in the work area.

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15.0 EMERGENCY RESPONSE PLAN & CONTINGENCY PLAN

First aid equipment will be maintained on-site in an easily accessible location.

15.1 FIRE, EMERGENCY AND EVACUATION ALARM PROCEDURE

All employees will be made aware of the fire, emergency and evacuation procedures. Voice communication will be used to alert workers to an emergency.

A. IN CASE OF FIRE, the procedure listed below will be followed:

1. Sound the alarm.

2. Secure equipment or vehicle(s).

3. Only attempt to extinguish small, controllable fires until help arrives, unless imminent danger exists. In case of uncontrollable fire, the area will be evacuated and the local fire department notified for assistance.

4. Evacuation will be necessary whenever an uncontrollable emergency threatens the health and safety at the site. Escape routes and a meeting place will be chosen by the Project Manager.

B. IN THE EVENT OF AN EVACUATION

All workers will get upwind of the hazard, and try to meet at a location 500 feet from the hazard. All supervisors will at that time take a head count of all employees to make sure that all are accounted for.

All surrounding residences will be alerted by the Incident Response Coordinator to the fact of a possible hazard, and should be advised to evacuate only upwind. A site for the affected general population to congregate after evacuation will be determined during site mobilization.

After the emergency is over, the Superintendent\Site Safety Officer will monitor the area to see if re-entry is safe. If so, he will determine if it is safe to return to work and he will tell the Project Manager of the results. The Project Manager will give orders to go to work.

15.2 ACCIDENT PROCEDURES

If physical injury or accidental exposure (i.e., inhalation, skin contact, or ingestion) occur, the following procedures are to be followed:

1. Remove the injured or exposed worker(s) from immediate danger.

2. Render First Aid as needed. Decontaminate affected personnel.

3. Call EMS for transport to the hospital. (Refer to emergency numbers listed in EMERGENCY INFORMATION). This procedure is recommended even if there is no apparent serious injury.

4. Evacuate other personnel from immediate affected area to a safe location until the Project Manager and/or the Site Safety Officer determines that it is safe for work to resume.

5. Report the accident as described in Section 13.5 - Reports - Accident Reporting Requirements.

6. Develop procedures or modify existing procedures to prevent a re-occurrence.

15.3 EMERGENCY RESPONSE TRAINING

Emergency response training will be provided to all "on-site personnel."

15.4 EMERGENCY INFORMATION

The following list of emergency services, locations and telephone numbers will be posted conspicuously by each telephone, and all site personnel will be made aware of their location. Administrative arrangements shall be made in advance with these support functions:

EMERGENCY SERVICE	TELEPHONE NUMBERS
Fire Department, Arlington, MA	911
Ambulance	911
Police Department, Arlington, MA	911
Hospital Emergency Room (Lawrence Memorial Hospital) (See attached directions in Appendix D)	(781) 306-6000
Poison Control Center	1-800-222-1222
Chemtrec	1-800-424-9300
Dig Safe	811

EMERGENCY PROJECT CONTACTS

Michael Dupuis, Project Executive, Commodore Builders	(508) 294-3836
Jim Hennelly, Safety Director, Commodore Builders	(603) 834-1818
Peter Duda, Project Safety Manager, Commodore Builders	(857) 636-9774
John Maffei, Superintendent\ Commodore Builders	(781) 953-7488
Michael Cashins, Certified Industrial Hygienist, Cashins & Assoc.	(781) 389-7170
Nico DiCarlo, Site Industrial Hygiene Officer, Cashins & Assoc.	(781) 799-1916

15.5 REPORTS

In the event that an emergency response, evacuation, accident, theft, injury, exposure, or some other incident occurs on the site during the course of project operations (within 24 hrs.) the Commodore Builders shall immediately notify the Owner and Project Engineer verbally and submit to the Owner and Project Engineer a written summary/report of each accident/occurrence.

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16.0 SPILL CONTAINMENT PROGRAM

On a day-to-day basis, individual personnel will be instructed to be constantly alert for indicators of potentially hazardous situations and for signs and symptoms that warn of hazardous conditions and exposures. In the event of a chemical spill each person involved in the response will be trained in proper emergency response procedures. The Superintendent and SIHO will survey and assess the magnitude of the problem. The supervisor will use MSD Sheets for information about unfamiliar materials. Once the scope of the problem has been defined, the personnel, having given due consideration to health hazards and personnel protection, will proceed with the proper emergency action. Workers will be instructed in procedures to be followed when dealing with a chemical release. Personal Protective Equipment will be maintained on-site by the Site Safety Officer. All chemicals stored on-site will be stored in a diked area or contained to prevent the spread of the chemical in the case of a release.

All spill notification actions shall be in conformance with MA DEP Environmental Requirements. In particular, the following procedure shall be followed in the event of a release of a hazardous substance or hazardous waste:

Action 1: The employee who first discovers the release shall attempt to immediately notify the Owner and Project Engineer of the release prior to making any Federal or State agency notifications.

Action 2: Once the Owner has been notified, the Owner may go to the Site and work in coordination with the Commodore Builders to determine if a release has occurred.

Action 3: If the release has occurred at an Owner E.P.A. I.D. site (e.g., Station), the Owner will implement the Contingency Plan and/or the SPCC Plan for the facility.

Action 4: If the release has occurred at a location other than the Owner's property (e.g., city street, right of way), the Owner may go to the location of the release and work in coordination with the Commodore Builders to determine the appropriate response action.

Action 5: When a release occurs, the Commodore Builders shall provide immediate verbal notification to the Owner. If a reportable quantity release has occurred, the Owner shall contact the appropriate agencies. The authorities to be notified may include, but may not be limited to:

National Response Center (NRC)
State Environmental Agency (RIDEM, MADEP, NHDES, VTDEC)
Local Emergency Planning Committee (LEPC)
State Emergency Response Commission (SERC)

Action 6: When a release occurs, Commodore Builders shall determine on its own form all

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release response actions. The Commodore Builders shall submit this information to the Owner and Project Engineer within one working day after a release has occurred. However, verbal notification must be given to the Owner and Project Engineer immediately after a release has occurred.

In the event of a **minor spill**, the following steps will be taken:

- If spilled on equipment or work platform, clean up with Speedy-Dry aggregate, absorbent pads and or absorbent pillows.
- If spilled in the water, contain the spill with absorbent booms and absorb all floating product with pillows and pads.
- If spill occurs on land, prevent the spill from reaching water ways or storm drains using earthen berms or other similar barriers. Remediate the spill area according to State and Federal Regulations.

In the event that a **major spill** occurs, the following steps shall be taken:

- Contain the spill to the smallest area possible using booms, berms or any other effective barrier.
- The Site Superintendent will be the emergency coordinator. It will be the responsibility of the emergency coordinator to follow through with the notification procedures.
- In the event that additional emergency cleanup help is needed, Commodore Builders Company will request assistance from its Emergency Response Contractor.
- Commodore Builders will collect all waste discharged, including contaminated booms and absorbent materials.
- All cleanup materials and contaminants shall be disposed of as a hazardous waste and in accordance with all applicable hazardous waste regulations.
- All emergency equipment will be decontaminated prior to being serviced.
- Contaminated wash water, waste solutions or residues generated from washing or decontaminating the equipment shall be collected and disposed of in compliance with all applicable State and Federal Regulations.
- Commodore Builders will keep all records relating to the spill of hazardous waste for a period of at least three years after the spill has been cleaned up or for such longer periods of time as required in any unresolved enforcement action.

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APPENDIX A

SOIL CONTAMINATION DATA

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Summary Table of Site Contaminants:

Contaminant	Range of Detected Concentrations in Soil (mg/kg)	Range of Detected Concentrations in Groundwater (mg/L)
Total Chromium	21 to 39,000	0.03 to 63
Hexavalent Chromium	1.5 to 6,790	0.0016 to 100
Lead	1 to 1,580	0.0014 to 0.0067
Zinc	25 to 176	0.0087 to 0.018
Cyanide	0.33 to 160	0.02 to 15
VOCs	0.0052 to 260	0.001 to 16
PAHs	0.0045 to 2,600	0.00012 to 9.95
EPH Fractions	36 to 3,300	0.27 to 5.5
VPH Fractions	1.1 to 1,700	0.0027 to 3.2
TPH	2.6 to 42,000	0.008 to 17

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Table 1
Summary of Soil Analytical Results
Cells 2 through 18
Arlington Department of Public Works
51 Grove Street
Arlington, MA

Parameter	Units	MCP Reportable Concentrations RCS-1	Reuse Levels [1]		Sample Identification																			
					Cell 2	Cell 3	Cell 4		Cell 5		Cell 7		Cell 8		Cell 10		Cell 11		Cell 16		Cell 17		Cell 18	
			Lined Landfills	Unlined Landfill	C-2A	C-3A	C-4A	4F (2-5)	C-5A	5D (2-5')	C-7A	7F (2-5')	C-8A	8J (0-2')	C-10A	10E (0-3')	C-11A	11G (2-5')	C-16	16D (2-5')	C-17	17C (3-6')	C-18	18B (2-4')
					1/4/2021	1/4/2021	1/4/2021	1/4/2021	1/5/2021	1/5/2021	1/5/2021	1/5/2021	1/6/2021	1/6/2021	1/5/2021	1/5/2021	1/6/2021	1/6/2021	1/7/2021	1/7/2021	1/4/2021	1/4/2021	1/5/2021	1/5/2021
TPH																								
TPH (C9-C36)	mg/kg	1,000	5,000	2,500	NT	NT	**47**	NT	**250**	NT	**390**	NT	**760**	NT	**1,900**	NT	**530**	NT	**360**	NT	**1,100**	NT	**53**	NT
SVOCs																								
ACENAPHTHENE	mg/kg	4	NS	NS	NT	NT	<0.19	NT	<0.18	NT	<0.18	NT	<0.18	NT	**3.7**	NT	<0.18	NT	<0.19	NT	**0.18**	NT	<0.20	NT
ACENAPHTHYLENE	mg/kg	1	NS	NS	NT	NT	<0.19	NT	<0.18	NT	**1.2**	NT	**3.3**	NT	**18**	NT	**2.3**	NT	**1.1**	NT	<0.18	NT	<0.20	NT
ANTHRACENE	mg/kg	1,000	NS	NS	NT	NT	<0.19	NT	<0.18	NT	**0.21**	NT	**1.1**	NT	**8.0**	NT	**0.65**	NT	**0.78**	NT	**0.73**	NT	<0.20	NT
BENZO(A)ANTHRACENE	mg/kg	7	NS	NS	NT	NT	<0.19	NT	**0.37**	NT	**2.5**	NT	**5.0**	NT	**35**	NT	**3.2**	NT	**1.7**	NT	**0.90**	NT	**0.26**	NT
BENZO(A)PYRENE	mg/kg	2	NS	NS	NT	NT	<0.19	NT	**0.37**	NT	**2.5**	NT	**4.9**	NT	**10**	NT	**3.7**	NT	**2.0**	NT	**0.80**	NT	**0.25**	NT
BENZO(B)FLUORANTHENE	mg/kg	7	NS	NS	NT	NT	<0.19	NT	**0.42**	NT	**2.5**	NT	**6.4**	NT	**12**	NT	**3.9**	NT	**2.3**	NT	**0.91**	NT	**0.28**	NT
BENZO(G,H,I)PERYLENE	mg/kg	1,000	NS	NS	NT	NT	<0.19	NT	**0.25**	NT	**1.2**	NT	**2.6**	NT	**5.7**	NT	**1.5**	NT	**1.2**	NT	**0.43**	NT	<0.20	NT
BENZO(K)FLUORANTHENE	mg/kg	70	NS	NS	NT	NT	<0.19	NT	<0.18	NT	**1.1**	NT	**2.3**	NT	**5.3**	NT	**1.4**	NT	**0.86**	NT	**0.32**	NT	<0.20	NT
CHRYSENE	mg/kg	70	NS	NS	NT	NT	<0.19	NT	**0.39**	NT	**2.6**	NT	**5.3**	NT	**15**	NT	**3.3**	NT	**1.8**	NT	**0.79**	NT	**0.25**	NT
DIBENZ(A,H)ANTHRACENE	mg/kg	0.7	NS	NS	NT	NT	<0.19	NT	<0.18	NT	**0.37**	NT	**0.79**	NT	**1.8**	NT	**0.47**	NT	**0.36**	NT	<0.18	NT	<0.20	NT
DIBENZOFURAN	mg/kg	100	NS	NS	NT	NT	<0.37	NT	<0.37	NT	<0.35	NT	<0.36	NT	**4.0**	NT	<0.36	NT	<0.37	NT	<0.36	NT	<0.40	NT
FLUORANTHENE	mg/kg	1,000	NS	NS	NT	NT	**0.27**	NT	**0.53**	NT	**2.3**	NT	**4.2**	NT	**23**	NT	**3.6**	NT	**2.7**	NT	**2.5**	NT	**0.51**	NT
FLUORENE	mg/kg	1,000	NS	NS	NT	NT	<0.19	NT	<0.18	NT	<0.18	NT	**0.41**	NT	**12**	NT	**0.23**	NT	**0.20**	NT	**0.32**	NT	<0.20	NT
INDENO(1,2,3-CD)PYRENE	mg/kg	7	**NS**	NS	NT	NT	<0.19	NT	**0.22**	NT	**1.2**	NT	**3.0**	NT	**5.9**	NT	**1.7**	NT	**1.4**	NT	**0.49**	NT	<0.20	NT
2-METHYLNAPHTHALENE	mg/kg	0.7	NS	NS	NT	NT	<0.19	NT	<0.18	NT	<0.18	NT	<0.18	NT	**58**	NT	<0.18	NT	**0.27**	NT	**0.25**	NT	<0.20	NT
NAPHTHALENE	mg/kg	4	NS	NS	NT	NT	<0.19	NT	<0.18	NT	<0.18	NT	<0.18	NT	**3.7**	NT	**0.25**	NT	**0.31**	NT	**0.62**	NT	<0.20	NT
PHENANTHRENE	mg/kg	10	NS	NS	NT	NT	<0.19	NT	**0.38**	NT	**0.19**	NT	**2.0**	NT	**71**	NT	**1.1**	NT	**2.3**	NT	**2.8**	NT	**0.47**	NT
PYRENE	mg/kg	1,000	NS	NS	NT	NT	**0.26**	NT	**0.75**	NT	**5.5**	NT	**8.0**	NT	**40**	NT	**6.2**	NT	**3.2**	NT	**1.9**	NT	**0.52**	NT
TOTAL SVOCs	mg/kg	NS	100	100	NT	NT	**0.53**	NT	**3.68**	NT	**23.37**	NT	**49.30**	NT	**313.10**	NT	**33.50**	NT	**22.48**	NT	**13.94**	NT	**2.54**	NT
VOCs																								
NAPHTHALENE	mg/kg	4	NS	NS	NT	NT	NT	<0.0034	NT	<0.0038	NT	<0.0037	NT	<0.0039	NT	**0.60**	NT	<0.0042	NT	<0.0040	NT	NT	NT	<0.0037
TETRACHLOROETHYLENE	mg/kg	1	NS	NS	NT	NT	NT	**0.0030**	NT	<0.0019	NT	<0.0018	NT	<0.0019	NT	<0.27	NT	<0.0021	NT	<0.0020	NT	NT	NT	<0.0018
TOLUENE	mg/kg	30	NS	NS	NT	NT	NT	**0.0020**	NT	<0.0019	NT	<0.0018	NT	<0.0019	NT	<0.27	NT	<0.0021	NT	<0.0020	NT	NT	NT	<0.0018
1,2,4-TRIMETHYLBENZENE	mg/kg	1,000	NS	NS	NT	NT	<0.0017	NT	<0.0019	NT	<0.0018	NT	<0.0019	NT	**4.0**	NT	<0.0021	NT	<0.0020	NT	NT	NT	NT	<0.0018
1,3,5-TRIMETHYLBENZENE	mg/kg	10	NS	NS	NT	NT	<0.0017	NT	<0.0019	NT	<0.0018	NT	<0.0019	NT	**2.1**	NT	<0.0021	NT	<0.0020	NT	NT	NT	NT	<0.0018
O-XYLENE	mg/kg	100	NS	NS	NT	NT	<0.0017	NT	<0.0019	NT	<0.0018	NT	<0.0019	NT	**0.47**	NT	<0.0021	NT	<0.0020	NT	NT	NT	NT	<0.0018
TOTAL VOCs	mg/kg	NS	10	4	NT	NT	NT	**0.01**	NT	BDL	NT	BDL	NT	BDL	NT	**7.17**	NT	BDL	NT	BDL	NT	NT	NT	BDL
PCBs																								
TOTAL PCBs	mg/kg	1	<2	<2	NT	NT	<0.088	NT	<0.087	NT	<0.083	NT	<0.085	NT	<0.10	NT	<0.084	NT	<0.087	NT	<0.086	NT	<0.093	NT
Total Metals																								
ARSENIC	mg/kg	20	40	40	NT	NT	**27**	NT	**7.2**	NT	<3.4	NT	<3.5	NT	**17**	NT	**6.8**	NT	**9.7**	NT	**6.3**	NT	**7.0**	NT
CADMIUM	mg/kg	70	80	30	NT	NT	**0.75**	NT	<0.35	NT	<0.34	NT	<0.35	NT	<0.41	NT	<0.35	NT	<0.35	NT	<0.34	NT	<0.38	NT
CHROMIUM	mg/kg	100	1,000	1,000	NT	NT	**55**	NT	**130**	NT	**73**	NT	**130**	NT	**14,000**	NT	**420**	NT	**1,800**	NT	**170**	NT	**500**	NT
CYANIDE	mg/kg	30	NS	NS	NT	NT	<0.55	NT	<0.53	NT	<0.49	NT	<0.45	NT	**0.95**	NT	**2.7**	NT	**1.2**	NT	<0.46	NT	<0.54	NT
LEAD	mg/kg	200	2,000	1,000	**11**	**57**	**19**	NT	**20**	NT	**12**	NT	**52**	NT	**8.4**	NT	**34**	NT	**40**	NT	**23**	**65**	**18**	NT
MERCURY	mg/kg	20	10	10	NT	NT	**0.036**	NT	<0.027	NT	<0.025	NT	**0.040**	NT	<0.032	NT	**0.064**	NT	**0.10**	NT	<0.026	NT	<0.029	NT
TCLP Metals																								
CHROMIUM	mg/l	NS	5.0	5.0	NT	NT	NT	NT	**1.8**	NT	NT	NT	**0.052**	NT	**27**	NT	**0.20**	NT	**13**	NT	**0.43**	NT	**29**	NT
General Chemistry																								
SPECIFIC CONDUCTANCE	µmhos/cm	NS	8,000	4,000	NT	NT	**54**	NT	**43**	NT	**24**	NT	**94**	NT	**470**	NT	**19**	NT	**390**	NT	**29**	NT	**61**	NT
FLASHPOINT	°F	NS	NS	NS	NT	NT	**> 212**	NT	**> 212**	NT	**> 212**	NT	**> 212**	NT	**> 212**	NT	**> 212**	NT	**> 212**	NT	**> 212**	NT	**> 212**	NT
REACTIVE CYANIDE	mg/kg	NS	NS	NS	NT	NT	<4.0	NT	<4.0	NT	<4.0	NT	<4.0	NT	<4.0	NT	<4.0	NT	<4.0	NT	<3.9	NT	<4.0	NT
REACTIVE SULFIDE	mg/kg	NS	NS	NS	NT	NT	<20	NT	<20	NT	<20	NT	<20	NT	<20	NT	<20	NT	<20	NT	<20	NT	<20	NT
PH	pH Units	NS	NS	NS	NT	NT	**10**	NT	**11**	NT	**9.3**	NT	**7.9**	NT	**13**	NT	**6.9**	NT	**10**	NT	**9.1**	NT	**11**	NT
% Solids																								
% SOLIDS	% WT	NS	NS	NS	**94.4**	**84.2**	**91.0**	**87.5**	**91.7**	**91.2**	**96.8**	**96.4**	**94.1**	**94.2**	**78.8**	**86.1**	**94.8**	**87.2**	**87.7**	**92.3**	**93.3**	**92.7**	**86.0**	**85.8**

QC by MFH 01/18/2021

Abbreviations:
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
NS = No Standard
NT = Not Tested
BDL = Below Detection Limit

Notes:
< = Parameter not detected above laboratory method reporting limit, shown.
BOLD Parameter detected above laboratory detection limit
BOLD Parameter detected above MCP Reportable Concentration RCS-1.
BOLD Parameter detected above MCP Reportable Concentration RCS-1 and COMM-97-001 Lined and Unlined Landfill Reuse Levels.
BOLD Parameter detected above COMM-97-001 Unlined Landfill Reuse Levels.
BOLD Parameter detected above COMM-97-001 Lined and Unlined Landfill Reuse Levels.
BOLD Total analysis results are more than the TCLP limit and is a hazardous waste.

Addendum No. 1

CASHINS & ASSOCIATES, Inc.
599 North Avenue, Suite 8 • Wakefield, MA 01880 • Phone: 781-245-1400 • Fax: 781-245-3100

Table 1
Summary of Soil Analytical Results
Cells 19 through 25
Arlington Department of Public Works
51 Grove Street
Arlington, MA

Parameter	Units	MCP Reportable Concentration RCS-1	Reuse Levels [1]		Sample Identification											
					Cell 19		Cell 20		Cell 21		Cell 22		Cell 23		Cell 24		Cell 25	
			Lined Landfills	Unlined Landfill	C-19	19C (0-1')	C-20	20D (0-2')	C-21	21G (2-5')	C-22	22H (6-9')	C-23	23D (0-2')	C-24	24A (0-3')	C-25	25B (4-8')
					1/5/2021	1/5/2021	1/6/2021	1/6/2021	1/5/2021	1/5/2021	1/7/2021	1/7/2021	1/4/2021	1/4/2021	1/4/2021	1/4/2021	1/4/2021	1/4/2021
TPH																		
TPH (C9-C36)	mg/kg	1,000	5,000	2,500	130	NT	380	NT	160	NT	400	NT	86	NT	35	NT	330	NT
SVOCs																		
ACENAPHTHENE	mg/kg	4	NS	NS	<0.19	NT	<0.18	NT	<0.19	NT	<0.19	NT	<0.18	NT	<0.19	NT	<0.18	NT
ACENAPHTHYLENE	mg/kg	1	NS	NS	<0.19	NT	0.44	NT	<0.19	NT	0.36	NT	0.30	NT	<0.19	NT	0.32	NT
ANTHRACENE	mg/kg	1,000	NS	NS	<0.19	NT	<0.18	NT	<0.19	NT	0.35	NT	<0.18	NT	<0.19	NT	0.60	NT
BENZO(A)ANTHRACENE	mg/kg	7	NS	NS	0.25	NT	0.61	NT	0.27	NT	1.1	NT	0.46	NT	<0.19	NT	2.1	NT
BENZO(A)PYRENE	mg/kg	2	NS	NS	0.28	NT	0.65	NT	0.28	NT	1.1	NT	0.53	NT	<0.19	NT	2.1	NT
BENZO(B)FLUORANTHENE	mg/kg	7	NS	NS	0.29	NT	0.72	NT	0.36	NT	1.2	NT	0.56	NT	<0.19	NT	2.3	NT
BENZO(G,H,I)PERYLENE	mg/kg	1,000	NS	NS	0.20	NT	0.35	NT	0.20	NT	0.84	NT	0.28	NT	<0.19	NT	1.2	NT
BENZO(K)FLUORANTHENE	mg/kg	70	NS	NS	<0.19	NT	0.24	NT	<0.19	NT	0.47	NT	0.22	NT	<0.19	NT	0.84	NT
CHRYSENE	mg/kg	70	NS	NS	0.25	NT	0.63	NT	0.31	NT	1.1	NT	0.49	NT	<0.19	NT	1.7	NT
DIBENZ(A,H)ANTHRACENE	mg/kg	0.7	NS	NS	<0.19	NT	<0.18	NT	<0.19	NT	0.21	NT	<0.18	NT	<0.19	NT	0.30	NT
FLUORANTHENE	mg/kg	1,000	NS	NS	0.25	NT	0.80	NT	0.46	NT	2.0	NT	0.52	NT	<0.19	NT	5.3	NT
FLUORENE	mg/kg	1,000	NS	NS	<0.19	NT	<0.18	NT	<0.19	NT	<0.19	NT	<0.18	NT	<0.19	NT	0.26	NT
INDENO(1,2,3-CD)PYRENE	mg/kg	7	NS	NS	0.20	NT	0.39	NT	<0.19	NT	0.86	NT	0.32	NT	<0.19	NT	1.5	NT
2-METHYLNAPHTHALENE	mg/kg	0.7	NS	NS	<0.19	NT	0.20	NT	<0.19	NT	1.1	NT	<0.18	NT	<0.19	NT	<0.18	NT
NAPHTHALENE	mg/kg	4	NS	NS	<0.19	NT	0.27	NT	<0.19	NT	1.9	NT	<0.18	NT	<0.19	NT	<0.18	NT
PHENANTHRENE	mg/kg	10	NS	NS	<0.19	NT	0.37	NT	0.35	NT	1.7	NT	0.29	NT	<0.19	NT	2.0	NT
PYRENE	mg/kg	1,000	NS	NS	0.51	NT	1.3	NT	0.59	NT	2.5	NT	0.73	NT	<0.19	NT	4.3	NT
TOTAL SVOCs	mg/kg	NS	100	100	2.23	NT	6.97	NT	2.82	NT	16.79	NT	4.70	NT	BDL	NT	24.82	NT
VOCs																		
BENZENE	mg/kg	2	NS	NS	NT	<0.0018	NT	<0.0018	NT	0.027	NT	2.2	NT	<0.0021	NT	<0.0019	NT	<0.0023
NAPHTHALENE	mg/kg	4	NS	NS	NT	<0.0036	NT	<0.0037	NT	<0.0043	NT	42	NT	<0.0042	NT	<0.0038	NT	<0.0046
STYRENE	mg/kg	3	NS	NS	NT	<0.0018	NT	<0.0018	NT	<0.0021	NT	1.4	NT	<0.0021	NT	<0.0019	NT	<0.0023
TOLUENE	mg/kg	30	NS	NS	NT	<0.0018	NT	<0.0018	NT	0.0075	NT	4.6	NT	<0.0021	NT	<0.0019	NT	<0.0023
1,2,4-TRIMETHYLBENZENE	mg/kg	1,000	NS	NS	NT	<0.0018	NT	<0.0018	NT	<0.0021	NT	1.4	NT	<0.0021	NT	<0.0019	NT	<0.0023
M/P-XYLENE	mg/kg	100	NS	NS	NT	<0.0036	NT	<0.0037	NT	<0.0043	NT	3.3	NT	<0.0042	NT	<0.0038	NT	<0.0046
O-XYLENE	mg/kg	100	NS	NS	NT	<0.0018	NT	<0.0018	NT	<0.0021	NT	0.94	NT	<0.0021	NT	<0.0019	NT	<0.0023
TOTAL VOCs	mg/kg	NS	10	4	NT	BDL	NT	BDL	NT	0.03	NT	55.84	NT	BDL	NT	BDL	NT	BDL
PCBs																		
TOTAL PCBs	mg/kg	1	<2	<2	<0.089	NT	<0.087	NT	<0.088	NT	<0.091	NT	<0.086	NT	<0.088	NT	<0.087	NT
Total Metals																		
ARSENIC	mg/kg	20	40	40	6.1	NT	9.7	NT	6.7	NT	16	NT	3.6	NT	6.9	NT	5.0	NT
CHROMIUM	mg/kg	100	1,000	1,000	87	NT	730	NT	1,500	NT	5,900	NT	170	NT	27	NT	33	NT
CYANIDE	mg/kg	30	NS	NS	<0.51	NT	0.49	NT	<0.51	NT	4.0	NT	<0.41	NT	<0.54	NT	<0.46	NT
LEAD	mg/kg	200	2,000	1,000	24	NT	19	NT	39	NT	23	NT	21	NT	13	NT	20	NT
MERCURY	mg/kg	20	10	10	<0.028	NT	<0.027	NT	0.046	NT	0.085	NT	<0.027	NT	0.043	NT	0.062	NT
TCLP Metals																		
CHROMIUM	mg/l	NS	5.0	5.0	NT	NT	0.25	NT	11	NT	21	NT	0.20	NT	NT	NT	NT	NT
General Chemistry																		
SPECIFIC CONDUCTANCE	µmhos/cm	NS	8,000	4,000	45	NT	96	NT	90	NT	570	NT	38	NT	6.6	NT	16	NT
FLASHPOINT	°F	NS	NS	NS	> 212	NT	> 212	NT	> 212	NT	> 212	NT	> 212	NT	> 212	NT	> 212	NT
REACTIVE CYANIDE	mg/kg	NS	NS	NS	<4.0	NT	<4.0	NT	<4.0	NT	<4.0	NT	<4.0	NT	<3.9	NT	<4.0	NT
REACTIVE SULFIDE	mg/kg	NS	NS	NS	<20	NT	<20	NT	<20	NT	<20	NT	<20	NT	<20	NT	<20	NT
PH	pH Units	NS	NS	NS	8.2	NT	10	NT	9.2	NT	13	NT	9.9	NT	7.6	NT	8.6	NT
% Solids																		
% SOLIDS	% WT	NS	NS	NS	89.7	94.5	92.5	95.9	91.4	90.0	85.9	64.9	93.3	94.1	91.2	90.1	92.3	84.8

QC by MYH 01/18/2021

Abbreviations:
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Notes:
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BOLD Parameter detected above COMM-97-001 Lined and Unlined Landfill Reuse Levels.
BOLD Total analysis results are more than the TCLP limit and is a hazardous waste.

Addendum No. 1

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APPENDIX B

STANDARD OPERATING PROCEDURES/WORK PRACTICES AND ENGINEERING CONTROLS

CASHINS & ASSOCIATES, Inc.
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STANDARD OPERATING PROCEDURES/WORK PRACTICES AND ENGINEERING CONTROLS

Site preparation, onsite construction and excavation will require work in a potentially hazardous environment which presents physical hazards as well as chemical hazards. As per the OSHA requirements under 29 CFR 1926, 29 CFR 1910.120, site specific standard operating safety procedures have been established. These controls are included as a general guideline.

TRENCHING

OSHA's construction safety and health standard identifies a trench as a narrow excavation made below the surface of the ground in which the depth is greater than the width: the width not exceeding 15 feet. Site conditions that should be considered prior to commencement of trenching include traffic, nearness to structures, soil type, surface and ground water, water table, overhead and underground utilities and weather.

All employees involved in excavation work will be protected from potential cave-ins by sloping or benching the sides of the excavation, supporting the sides, or placing a shield between the side of the excavation and the work area. All aspects of the OSHA 29 CFR Part 1926.650, 652 will be complied with.

GENERAL SAFETY RULES

The following safety rules have been addressed in more detail in the project health and safety plan. They are listed in this plan to emphasize their importance in the overall health and safety program:

(a) All work shall be planned and supervised to prevent injuries.

(b) Equipment operators shall be thoroughly trained on the safe operations of their equipment.

(c) All injuries and accidents will be reported to the SUPERINTENDENT\SITE SAFETY MANAGER who will in turn report to the project Engineer.

(d) Supervisors will ensure that employees observe and obey all safety rules and regulations required for the safe conduct of work.

(e) An employee reporting for work who, in the opinion of his supervisor, is unable to perform his assigned duties in a safe and reasonable manner will not be allowed on the job.

(f) Alcoholic beverages and non-prescribed drugs will not be allowed onsite.

(g) No employee shall be assigned a task without first having been instructed on the

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proper methods of carrying out the task.

(h) There will be no horseplay or practical joking on the site.

(i) All posted safety signs shall be obeyed.

SITE APPEARANCE

(a) An adequate passageway for vehicles will be maintained to all occupied area of the site.

(b) All trash and discarded materials will be staged in an orderly appearance and removed on a regular basis.

(c) Space around onsite emergency and fire fighting equipment will be kept clear.

EQUIPMENT

(a) Employees will not handle or attempt to operate power tools or motorized vehicles without first being properly trained.

(b) Materials, tools, or other objects will not be thrown, tossed, or dropped "Always hand or lower items".

(c) Apparatus, tools, or other objects will not be repaired while in operation.

(d) Prior to digging or drilling, verification of buried utilities shall be performed.

(e) All equipment which is defective or in need of service shall be reported and tagged.

PERSONAL PROTECTIVE EQUIPMENT

(a) Hard hats and work boots will be worn at all times onsite.

(b) Safety glasses, safety goggles, or face shields will be worn at all times where eye hazards due to flying particles or hazardous substances exist.

(c) Ear protection will be worn during all operations in which noise level readings are >85 dBA.

(d) Jewelry, loose sleeves, cuffs or other loose clothing that can become entangled in machinery will not be worn.

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APPLICABLE SAFETY STANDARDS

The applicable construction safety standards which will be observed during site operations include but are not limited to the following:

General Safety & Health Provisions
29 CFR 1926 Subpart C

Occupational Health & Environmental Controls
29 CFR 1926 Subpart D

Personal Protective & Life Saving Equipment
29 CFR 1926 Subpart E

Fire Protection and Prevention
29 CFR 1926 Subpart F

Signs, Signals, and Barricades
29 CFR 1926 Subpart G

Materials Handling, Storage, Use and Disposal
29 CFR 1926 Subpart H

Hand and Power Tools
29 CFR 1926 Subpart I

Welding and Cutting
29 CFR 1926 Subpart J

Electrical
29 CFR 1926 Subpart K

Ladders and Scaffolding
29 CFR 1926 Subpart L

Floor and Wall Openings, & Stairways
29 CFR 1926 Subpart M

Cranes, Derricks, Hoists, & Conveyors
29 CFR 1926 Subpart N

Motor Vehicles & Mechanized Equipment
29 CFR 1926 Subpart O

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Excavations, Trenching, & Shoring
29 CFR 1926 Subpart P

Concrete, Concrete Forms, & Shoring
29 CFR 1926 Subpart Q

Underground Construction, Caisson, Cofferdams, and Compressed Air.
29 CFR 1926 Subpart S

CONFINED SPACE ENTRY

The interior of manholes, cut and cover box, and all trenches are confined spaces. Prior to entry into a confined space, the SIHO will determine air quality of the space, and determine the appropriate personal protective equipment (PPE). The SIHO shall also determine the need for appropriate backup personnel, and emergency recovery equipment such as a harness and recovery winch. Before an entry is made into the confined space, the SIHO shall issue a confined space entry permit which will outline requirements for PPE, air monitoring, emergency backup, emergency egress equipment, lock-out/tag-out requirements for machinery, and any special circumstances. The SIHO will determine if the space will be considered a permitted or non-permitted confined space.

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APPENDIX C

DIRECTIONS TO
LAWRENCE MEMORIAL HOSPITAL – ARLINGTON

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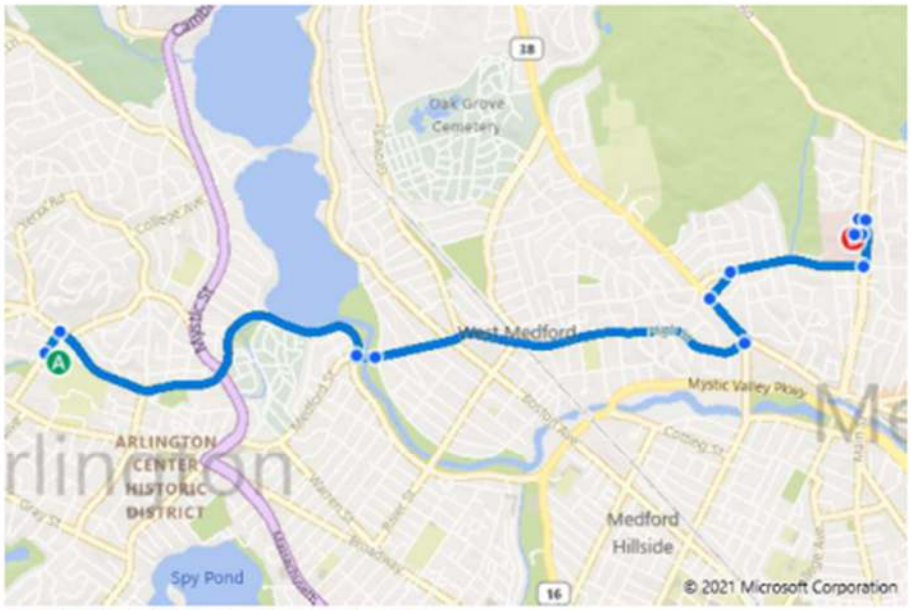
Maps



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16 min • 3.8 mi
Light traffic (2 min delay)
via Mystic Valley Pkwy, MA-2A and MA-60

51 Grove St, Arlington, MA 02476
51 Grove St, Arlington, MA 02476

- Head northeast on Grove St
- 463 ft
  Turn right onto Summer St
- 1.3 mi
  At the traffic circle take the third exit onto Medford St
- 512 ft
  At the traffic circle take the second exit onto High St
- 1.3 mi
  At the traffic circle take the fourth exit onto Winthrop St
- 0.2 mi
  Turn right onto Burbank Rd

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0.1 mi
Turn right onto Lawrence Rd

0.5 mi
Turn left onto Governors Ave

0.2 mi
Turn left

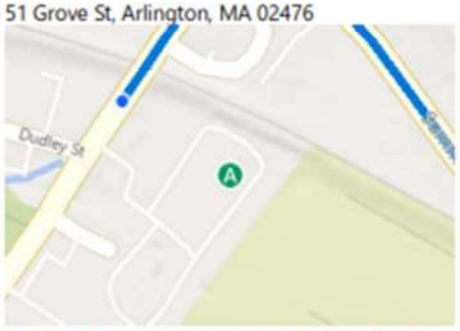
125 ft
Turn left

266 ft
Turn right

128 ft
Your destination is on the left

Lawrence Memorial Hospital Emergency Department
170 Governors Avenue, Medford, MA, 02155

51 Grove St, Arlington, MA 02476



Lawrence Memorial Hospital Emergency Department

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APPENDIX D

TYPICAL DECON LAYOUT

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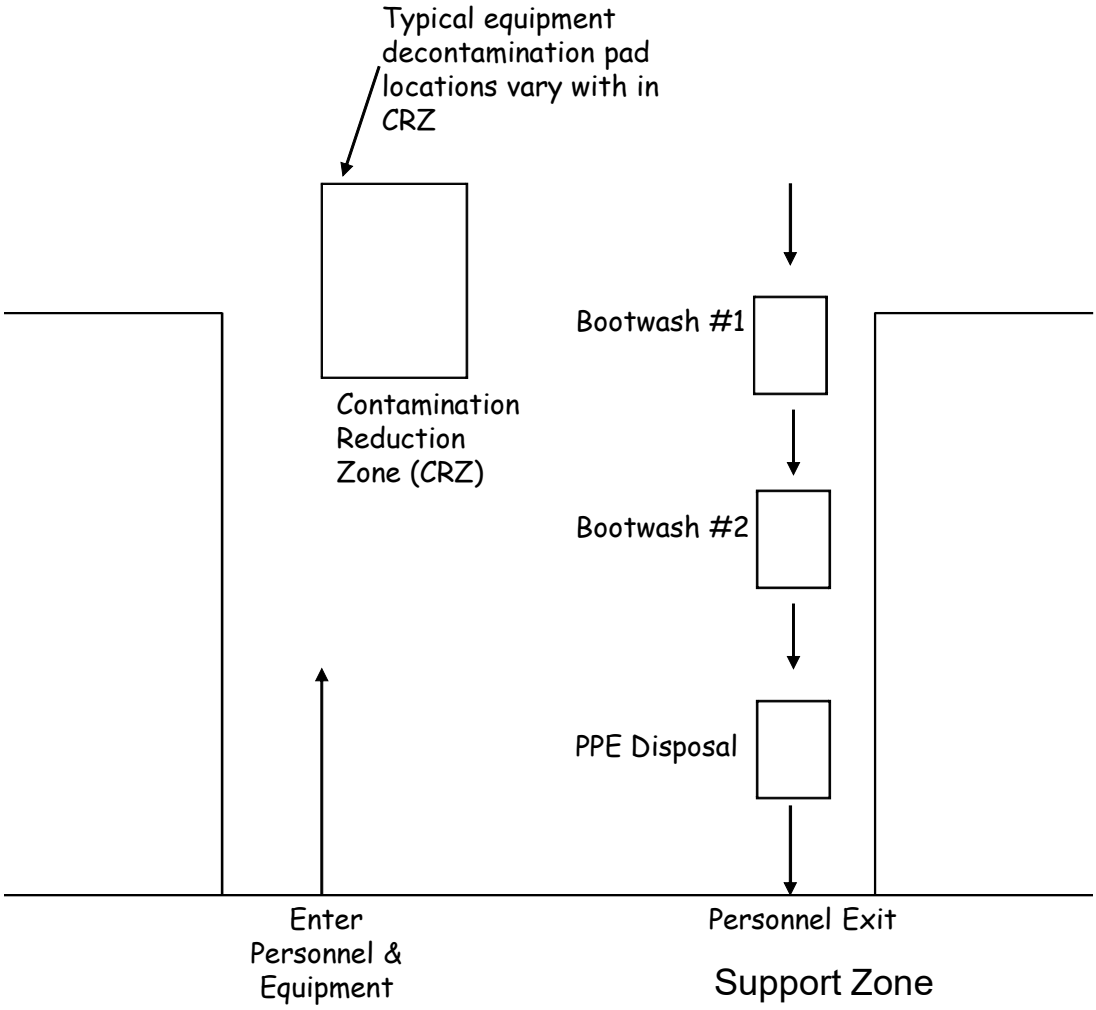
Typical Exclusion Zone & Decontamination Corridor Sketch



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