APPENDIX G

Health and Safety Plan

Lower Duwamish Waterway Group

Port of Seattle / City of Seattle / King County / The Boeing Company

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Enhanced Natural Recovery/Activated Carbon Pilot Study

Lower Duwamish Waterway

FINAL

Prepared for:

The U.S. Environmental Protection Agency
Region 10
Seattle, Washington

The Washington State Department of Ecology
Northwest Regional Office
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ABBREVIATIONS AND ACRONYMS

AC	activated carbon
bpm	beats per minute
CRZ	contamination reduction zone
°F	degrees Fahrenheit
DOF	Dalton, Olmsted & Fuglevand, Inc.
DOSH	Division of Occupational Safety and Health
ENR	enhanced natural recovery
ENR+AC	enhanced natural recovery amended with activated carbon
HASP	health and safety plan
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
Order Amendment	Second Amendment (July 2014) to the Administrative Order on Consent for Remedial Investigation/Feasibility Study for the Lower Duwamish Waterway
PCB	polychlorinated biphenyl
PFD	personal flotation device
PPE	personal protective equipment
ppm	parts per million
PVC	polyvinyl chloride
SDS	Safety Data Sheet
SHSO	site health and safety officer
WAC	Washington Administrative Code

SITE-SPECIFIC HEALTH AND SAFETY PLAN
Enhanced Natural Recovery/Activated Carbon Pilot Study
Lower Duwamish Waterway

1.0 INTRODUCTION

This site-specific health and safety plan (HASP) addresses the health and safety practices and controls that will be implemented by members of the Lower Duwamish Waterway (LDW) oversight management team from Amec Foster Wheeler and Dalton, Olmsted & Fuglevand, Inc. (DOF) during their construction and long-term monitoring oversight activities on the Enhanced Natural Recovery (ENR)/Activated Carbon (AC) Pilot Study. Their work activities include monitoring all phases of the construction of the pilot study, including the collection of surface sediment and porewater samples; the placement and distribution of cover material consisting of ENR and ENR amended with AC (ENR+AC) during the construction phase of the pilot study; and the collection of bathymetric survey data in the study area (the areas where the pilot project plots are constructed). They will also monitor postconstruction activities, such as, benthic infauna and sediment profile imagery camera surveys and evaluations of the physical condition of the cover material over time.

Because of the specialized nature of the many different site evaluation, construction activities, and long-term monitoring that will be conducted in the study area, each sub-contractor involved in the work will develop and implement its own HASP and provide activity safety analyses that address the tasks that they are responsible for. These subcontractor plans will be provided as attachments to this site-specific HASP and will be reviewed by Amec Foster Wheeler health and safety management for general conformance with applicable regulatory and site-specific health and safety requirements. Therefore, it should be stressed that the health and safety directives discussed herein apply only to Amec Foster Wheeler and DOF construction oversight management personnel who are engaged in the oversight activities mentioned in the previous paragraph. All personnel participating in or overseeing sampling or construction activities must be covered under a site-specific HASP. Regulatory personnel must follow the requirements in this HASP unless they are covered in a site-specific HASP developed by their agency. If regulatory personnel use this HASP to cover their field oversight activities, it is the responsibility of their agency to ensure that all required training and medical surveillance is conducted as per the requirements of this HASP. In addition, all regulatory personnel will be required to provide all required personal protective equipment for their use. Furthermore, this plan was developed specifically for this project and should not be used in whole or in part for any other project unless such application is reviewed and approved by the Lower Duwamish Waterway Group (LDWG). This plan, however, will be updated

as appropriate to account for changes in the scope of work and for new hazards discovered at the job site once work is underway.

Activities performed under this site-specific HASP will comply with the applicable sections of Washington Administrative Code, Chapter 296-843 (WAC 296-843) for hazardous waste site work and all other relevant Division of Occupational Safety and Health (DOSH) general occupational health regulations and construction safety standards. When appropriate, specific DOSH standards are referenced within the plan to highlight additional health and safety requirements that are not otherwise discussed. These standards will be available on site by means of an Internet connection with the Washington State Department of Labor and Industries Safety & Health web site.

The content of this plan and any relevant DOSH standards will be discussed with all oversight management personnel before work begins. However, said management does not guarantee the health or safety of any person entering this site. Because of the nature of this site and the many different activities occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards that may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury at this site.

As stated above, this plan covers Amec Foster Wheeler and DOF construction oversight management personnel who are engaged in the oversight activities. This plan does not cover diving that may be required for the construction oversight. A site-specific diving Construction Monitoring Health and Safety Plan will be developed by the diving sub-contractor when the scope of the activity is fully defined. The diving HASP will be an attachment (Attachment E) to this plan and will be provided for review later in 2015.

In addition, this plan does not cover water quality or other monitoring activities that will be conducted. Site-specific HASPs for the monitoring to be conducted will be provided when the scope of the activities have been fully defined and the subcontractors have been selected. Each subcontractor will provide a HASP that covers the activities that they will be conducting and will be attachments to this plan. It is anticipated that the following plans will be attached:

- Construction Water Quality Monitoring Health and Safety Plan (Attachment F),
- Monitoring Diving Health and Safety Plan (Attachment G),
- Sampling Health and Safety Plan (Attachment H), and
- Sediment Profile Imaging Health and Safety Plan (Attachment I)

These HASPs will be provided later in 2015.

2.0 DESCRIPTION OF PROJECT

LDWG will conduct a pilot study of an innovative sediment technology in the field to evaluate the potential effectiveness of the technology in the LDW. The study will determine whether ENR+AC reduce the bioavailability of polychlorinated biphenyls (PCBs) in remediated contaminated sediment in the LDW. The study will compare the effectiveness of ENR with added AC (ENR+AC) with that of ENR without added AC in three areas in the LDW, which are referred to as the intertidal, subtidal, and scour plots. For the purposes of this project, ENR involves the placement of a thin layer of clean material over subtidal or intertidal sediments. ENR+AC involves the placement of a thin layer of clean material augmented with AC over subtidal or intertidal sediments. The purpose of the ENR and ENR+AC treatments is to reduce the exposure of aquatic organisms to the contaminants of concern.

A pilot study was specified under the Second Amendment (July 2014) to the Administrative Order on Consent for Remedial Investigation/Feasibility Study for the Lower Duwamish Waterway (Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] Docket No. 10-2001-0055, issued on December 20, 2000).

The goals of the pilot study, as stated in the Order Amendment, are the following:

- Verify that ENR+AC can be successfully applied in the LDW by monitoring physical placement success (uniformity of coverage and percentage of carbon in a placed layer).
- Evaluate the performance of ENR+AC compared to ENR alone in locations with a range of PCB concentrations.
- Assess potential impacts on the benthic community in ENR+AC compared to ENR alone.
- Assess changes in bioavailability of PCBs in ENR+AC compared to ENR alone.
- Assess the stability of ENR+AC in scour areas (such as berthing areas).

Achieving these goals will involve the collection of pre- and postconstruction sediment and porewater samples from the three pilot plots in the LDW, placing ENR and ENR+AC material in the pilot plots, conducting bathymetric and visual surveys of the pilot plots, and evaluating marine benthic communities in the LDW subsequent to placement of the cover material.

Mechanical dredging equipment will be used to place the cover material, and commercial divers will conduct visual surveys of the pilot plots, install and retrieve porewater samplers, and collect bulk samples of the sediments before and after cover placement. Small boats will also be

operated at the site to conduct bathymetric surveys, collect sediment samples, and transport personnel to active work areas on the LDW. Specialty contractors will be hired to do this work. As indicated, the LDW oversight management team will be responsible for monitoring these work activities without participating in them directly.

When visiting the work area, oversight management team members will stay within designated areas of the site in coordination with the contractor. If it is necessary for them to enter controlled work areas, they will first notify the contractor in charge of the site, review the contractor's site-specific HASP, and comply with all health and safety requirements established by the contractor for entering its work areas.

3.0 HEALTH AND SAFETY PROJECT ORGANIZATION

3.1 PROJECT MANAGER

The project manager, Cliff Whitmus (Amec Foster Wheeler) is responsible for overall administration of site operations. His duties include directing the oversight management personnel; tracking the budget; ensuring that adequate resources are available to complete the oversight work; resolving site health and safety issues related to oversight management personnel, project planning, monitoring compliance with applicable environmental regulations, DOSH standards, and other client-specific requirements; and maintaining communications between oversight management personnel and site contractors, regulatory agencies, the client, and off-site resources. The project manager will report directly to LDWG.

3.2 FIELD OVERSIGHT MANAGEMENT PERSONNEL

Amec Foster Wheeler with support from DOF will provide oversight management of the project. The project organizational structure consists of a project engineer, Rob Webb, and a field technical lead/site health and safety officer (SHSO), Rich May or an equivalent alternate/substitute, along with field support staff whose specific roles and responsibilities are described in this paragraph. They will comply with and keep informed about the information, instructions, and emergency response actions included in this site-specific HASP and comply with all rules, regulations, and procedures established by other site contractors when entering or working in areas under their control. They will also inform the site contractors of any apparent health and safety hazards or unsafe work practices that could jeopardize the health and wellbeing of their workers. All field personnel including, most particularly, oversight management personnel, have the authority to stop work whenever they identify conditions or work activities that pose an unreasonable risk of injury or illness. The aforementioned oversight management personnel will report directly to their company health and safety manager and secondarily to the overall project manager.

3.3 SITE HEALTH AND SAFETY OFFICER

DOF's field technical lead, Rich May or his alternate/substitute, will act as the SHSO for DOF's oversight management activities on the project. This individual will meet the SHSO training requirements listed in Section 8.0 of this HASP and perform the emergency coordinator duties discussed in Section 13, as necessary. His or her site-specific health and safety duties will apply only to the oversight management team (not other contractors doing the work) and will include the following:

- Providing on-site monitoring to determine the appropriate levels and use of personal protective equipment (PPE)
- Ensuring that relevant sections of the site-specific HASP are being applied to the work
- Providing site surveillance, hazard identification, and health risk analysis related to oversight activities
- Initiating changes to the site-specific HASP, as necessary
- Ensuring that appropriate site control and decontamination measures are being implemented
- Conducting and documenting weekly health and safety briefings
- Maintaining health and safety field logbooks
- Conducting incident investigations
- Informing oversight management personnel of the contents of the site-specific HASP
- Maintaining medical clearance letters and training documentation for the oversight management team
- Conducting regular site safety inspections
- Exercising stop work authority when warranted by conditions
- Verifying that team members are adequately trained and qualified for the work

The SHSO will report directly to DOF's project engineer, Rob Webb.

3.4 TECHNICAL STAFF

Each member of DOF's and Amec Foster Wheeler's oversight management technical staff will be responsible for reporting any unsafe or potentially hazardous situations to the SHSO. The field technical staff will comply with and keep informed about the information, instructions, and emergency response actions contained in this HASP and comply with all rules, regulations, and procedures established by other site contractors when entering or working in areas under their

control. All field technical staff are expected to stop work and contact their supervisor whenever they believe their work, or that of their coworkers, poses an uncontrolled hazard or unreasonable risk of injury or illness. Furthermore, all field technical staff are expected and encouraged to participate in the implementation of the environmental safety and health process by participating in meetings, incident reporting and investigations, inspections, hazard identification, and hazard analyses.

3.5 SITE VISITORS

On occasion, appropriately authorized visitors may come to the site to observe the oversight management activities. Visitors may be from city, state, and federal regulatory and resource agencies that have a specific interest in the project, or they may be invited by the client, site contractors, or regulatory agencies.

Visitors intending to observe operations included in this HASP will be required to sign into the job site before being allowed access to their work area. Visitors will be briefed on the hazards of the site, contents of the site-specific HASP, site safety rules, hazard control measures, and required PPE. They will be escorted at all times by an oversight management team representative when entering active work areas to observe site operations. Visitors are expected to fully comply with all of the site health and safety requirements.

4.0 SITE CHARACTERIZATION

This section presents an assessment of the chemical and physical hazards that may be encountered during the tasks specified in Section 1.0 of this site-specific HASP. Additional hazard control information is provided in Attachment A and Attachment B. All site personnel will be informed of these hazards and the means that will be taken to control them before beginning work.

4.1 CHEMICAL CONTAMINANTS

In the fall of 2014, LDWG conducted extensive sediment sampling within the study area to characterize the nature and extent of contaminants present at the site (Windward, 2015). The samples were analyzed for PCBs; data for other contaminants, such as, metals (lead, arsenic, zinc, and mercury), bis(2-ethylhexyl)phthalate, and butyl benzyl phthalate, have also been collected during previous sampling efforts. The highest recorded PCB concentration in the study area was 4.0 parts per million (ppm), and lead, arsenic, zinc, and mercury were detected at the following maximum concentrations: 21,700 ppm, 290 ppm, 1,050 ppm, and 6.8 ppm, respectively. The compound bis(2-ethylhexyl)phthalate was detected in one sample at a maximum concentration of 81 ppm, and butyl benzyl phthalate was detected at 83 ppm.

Although all of the aforementioned contaminant concentrations exceeded the remedial action levels, none of them realistically poses a significant exposure hazard to oversight management personnel given that these substances are contained in wet sediments and are not likely to become airborne and thereby present an inhalation exposure hazard. Furthermore, oversight management activities do not involve contacting contaminated sediments to any significant degree. If, however, it is necessary for oversight management personnel to enter work areas where exposure to site contaminants is possible, they will comply with the work practice and personal protective measures required by the contractor in control of the job site.

4.2 PHYSICAL HAZARDS

Oversight management personnel are likely to encounter several physical hazards when they visit the job site to conduct their inspections. These hazards include exposure to noise; slips, trips, and falls; cold stress; possible contact with heavy, mechanical equipment operating at the job site; and boating-related injuries.

These hazards are discussed in the following subsections and in Attachment A.

4.2.1 Noise

The noise levels may exceed 85 decibels (dBs) at certain locations near the floating cranes used to place the cover material, the sediment sampling equipment, and the motorized boats. If oversight management personnel must work around these noise sources for the majority of their shift, they will be required to wear hearing protection, such as, ear plugs or muffs. Hearing protection will also be worn when required by the contractor in charge of the job site. Noise warning signs will be posted around each high-noise hazard area.

4.2.2 Slips, Trips, and Falls

There are likely to be slip, trip, and fall hazards onboard floating cranes and sample collection boats due to wet walkways, unsecured equipment left on deck, open hatches, and pitching and rolling actions of the vessels in rough water. These hazards may also exist on the dock where the boats will be moored. Uneven walking surfaces on shore and equipment left on the ground in the work area can also pose a slip and trip hazard for workers. These hazards will be controlled by keeping the work area and walkways free of debris and other litter. In addition, boat operators will ensure that all floor hatches are closed during normal operations and all stairways, walkways, and elevated work platforms are equipped with guard railings. Oversight management personnel will wear high-traction, steel-toed safety boots and pay careful attention to surface conditions to prevent injuries due to trips and falls. The work area will be inspected before the start of work to

identify any hazards that could cause injury. The results of these inspections will be communicated to site personnel at the start of each shift.

U.S. Coast Guard–approved personal flotation devices (PFDs) will be worn at all times when riding in boats, working within 6 feet of unguarded edges of docks, and over or near the water. All PFDs will be equipped with whistles. If used after dark, they will be fitted with retroreflective tape and water-activated strobe lights. They will be inspected after use and at intervals sufficient to ensure that they are well maintained and fully functional.

4.2.3 Heat and Cold Stress

Because all planned work activities will be conducted outside where the temperature conditions can vary greatly, there is a risk that site personnel could develop heat or cold stress; however, it is anticipated the construction will take place in the fall/winter when cold stress is more likely. The likelihood of heat or cold stress depends on the environmental conditions, the level of work activity, and the personal control measures that are used to manage heat loads (work/rest cycles, use of appropriate clothing and/or cooling devices, hydration, etc.).

4.2.3.1 Heat Stress

Heat-related injuries fall into three major categories: heat stroke, heat exhaustion, and heat cramps. The causes, symptoms, and first aid recommended by the National Institute for Occupational Health and Safety for each type of heat stress category are summarized in Table 1.

TABLE 1

HEAT STRESS SYMPTOMS AND RECOMMENDED FIRST AID

Type of Heat Stress	Cause	Symptoms	First Aid
Heat stroke	Heat stroke is the most serious heat-related disorder. It occurs when the body becomes unable to control its temperature: the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. When heat stroke occurs, the body temperature can rise to 106 degrees Fahrenheit or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not given.	Hot dry skin (no sweating), hallucinations, chills, throbbing headache, high body temperature, confusion/dizziness, and slurred speech.	Call 911 immediately. Have the person stop working and move him or her to a cool, shady area. Cool the person using methods such as (1) soaking person's clothes with water, (2) spraying, sponging, or showering person with room temperature water, and/or (3) fanning person's body. Ice or cold packs may also be used.

TABLE 1

HEAT STRESS SYMPTOMS AND RECOMMENDED FIRST AID

Type of Heat Stress	Cause	Symptoms	First Aid
Heat exhaustion	Heat exhaustion is the body's response to an excessive loss of water and salt, usually through excessive sweating. Workers most prone to heat exhaustion are those who are elderly or have high blood pressure, and those working in a hot environment.	Heavy sweating, extreme weakness or fatigue, dizziness or confusion, nausea, clammy moist skin, pale or flushed complexion, muscle cramps, slightly elevated body temperature, and fast and shallow breathing.	Have the person stop working and move him or her to a cool, shady area.
			Give the person plenty of water, juice, or other cool nonalcoholic beverages to drink.
			Have the person take a cool shower, bath, or sponge bath.
Heat cramps	Heat cramps usually affect workers who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture levels. Low salt levels in muscles cause painful cramps. Heat cramps may also be a symptom of heat exhaustion.	Muscle pain or spasms, usually in the arms, legs, and abdomen.	Have the person stop working and move him or her to a cool, shady area.
			Have the person drink clear juice or a sports beverage. Do not let person return to work until a few hours after cramps subside.
			Seek medical attention immediately if: (1) the person has heart problems, (2) the person is on a low sodium diet, or (3) the cramps do not subside within 1 hour.
Heat rash	Heat rash is a skin irritation caused by excessive sweating during hot, humid weather.	Formation of rash (red cluster of pimples or small blisters) usually on the neck and upper chest, in the groin, under the breasts, and/or in elbow creases.	Try to work in a cooler, less humid environment when possible.
			Keep the affected area dry. Dusting powder may be used to increase comfort.

Source: http://www.cdc.gov/niosh/topics/heatstress/#_Heat_Stroke (accessed June 2015)

The following control measures will be taken to manage concerns related to heat stress:

- The SHSO will ensure that site personnel are trained in the recognition and treatment of heat stress symptoms.
- Ambient temperatures in the work area will be monitored to establish work and rest schedules.
- Physiological monitoring of representative workers will be conducted as appropriate.
- Heat stress illness will be treated if it develops.

- Shaded rest areas, chilled beverages, reduced workloads, and frequent breaks will be provided to allow workers to cool down when conditions conducive to heat stress exist.
- The “buddy system” will be used to monitor coworkers for signs of heat stress.

Workers will also be encouraged to self-limit their exposures to heat stress conditions. Those who take medications that may compromise normal physiologic functioning will be counseled and monitored for heat stress.

Of particular concern in monitoring for heat stress is the use of personal protective clothing, which decreases natural body ventilation and greatly increases the temperature and humidity of the skin. If visual monitoring indicates that a worker is suffering from heat stress, or if the conditions and PPE requirements warrant it, workers will be evaluated for heat stress by monitoring their heart rate, body core temperature, and symptoms of heat stress. Excessive heat stress may be marked by one or more of the following conditions, and if any of these conditions are noted in an individual, the cause(s) will be rectified:

- Sustained heart rate is in excess of 180 beats per minute (bpm) minus the individual’s age in years, for individuals with assessed normal cardiac performance.
- Recovery heart rate at 1 minute after a peak work effort is greater than 110 bpm.
- Body core temperature—as measured with an infrared ear drum scanner—is greater than 100.4 degrees Fahrenheit (°F).
- There are symptoms of sudden and severe fatigue, nausea, dizziness, or lightheadedness.

First aid will be administered by trained site personnel. Immediate medical attention will be sought for workers exhibiting signs of heat stroke. Workers exhibiting signs of heat exhaustion will be treated and monitored by trained workers to determine whether medical intervention is required.

4.2.3.2 Cold Stress

There is also a risk that site personnel could become hypothermic if they fail to dress warmly in cold weather, or they get wet from rain, water splashes associated with the sediment sampling, or falling into the water. Staying dry and warm is crucial to preventing the development of hypothermia. The signs, symptoms, and treatments for cold stress (hypothermia) are discussed in the following text.

Signs and Symptoms of Hypothermia

Mild hypothermia (body temperature of 98°F–90°F)

- Shivering
- Lack of coordination, stumbling, and fumbling hands
- Slurred speech
- Memory loss
- Pale, cold skin

Moderate hypothermia (body temperature of 90°F–86°F)

- Cessation of shivering
- Inability to walk or stand
- Confusion and irrationality

Severe hypothermia (body temperature of 86°F–78°F)

- Severe muscle stiffness
- Very sleepy or unconscious
- Ice-cold skin
- Death

Stabilization and Basic Life Support

Mild hypothermia

- Move to a warm area.
- Stay active.
- Remove wet clothes and replace them with dry clothes or blankets and cover the head.
- Drink a warm (not hot) sugary drink.

Moderate hypothermia

All of the above, plus the following:

- Call the SHSO (Table 3) and transport to a medical facility.
- Completely cover all extremities.
- Place very warm objects, such as hot packs or water bottles on the head, neck, chest, and groin.

Severe hypothermia

- Call the SHSO (Table 3) and transport to a medical facility.
- Treat the victim very gently.
- Do not attempt to rewarm (victim should receive treatment in a medical facility).

Special Considerations

- Early recognition of hypothermia is imperative.
- Shivering does not occur when core body temperature is less than 90°F; at 90°F the victim may not even feel cold.
- At a body temperature less than 86°F, the heart may fibrillate. CPR may be necessary for extended periods.
- CPR is unnecessary if the patient has even a faint pulse and occasional respirations. In hypothermia, metabolic demands are greatly reduced. CPR is needed when there is no heart beat or when there is ventricular fibrillation.
- Airway manipulation should be avoided, if possible, because it may induce ventricular fibrillation in a hypothermic victim.
- Do not assume the victim is dead; full recovery has occurred even after periods of cardiac arrest.

4.2.4 Contact with Mechanical Equipment

Mechanical equipment, such as, sediment and core samplers, motorized winches, crane barges, and small boats will be used on this project to collect sediment samples, construct the pilot plots, and transport project personnel within the work area. These devices have gears and motors with rotating and reciprocating parts that if left unguarded, could pose a pinch and grab hazard. Boat passengers and crew can also be injured by ropes and cables used onboard to set anchors and tie off the vessel.

To control these hazards, the SHSO will inspect each work area where employees will be working to identify potential pinch, grab, crush, and struck-by hazards. If such hazards are found, the contractor responsible for the condition will be notified and asked to correct the problem. Corrective actions may involve installing guards over exposed, rotating parts; isolating or deenergizing equipment; establishing exclusion zones around high-hazard areas, establishing controlled vehicle traffic lanes; and constructing guardrails around mechanical equipment to prevent inadvertent contact. Until such time as these contact hazards can be controlled or eliminated, oversight management personnel will avoid working in any areas where the hazard exists.

4.2.5 Small-Boat Operations

Boat operations are associated with various risks, for example: (1) passengers or crew members falling overboard and possibly drowning, (2) striking other vessels or being struck by other vessels operating in the area, (3) losing power or steering capability and drifting into hazardous areas (i.e., shore, marine facilities, etc.), and (4) encountering severe weather and dangerous seas. The risk of a boating accident can be reduced by ensuring that the boat operators are experienced, operating the vessel in compliance with U.S. Coast Guard rules and regulations, maintaining the vessel in good mechanical order, avoiding bad weather and dangerous seas; and ensuring that emergency equipment is available onboard (i.e., life vests, life rings, life boats, fire extinguishers, communication equipment, etc.). Other safety precautions that will be taken during boat operations include the following:

- The vessels must have required U.S. Coast Guard safety equipment onboard in good operating condition, including a life jacket for each crew member, a first aid kit, fire extinguisher(s), distress flares, a throwable life ring, navigation charts for the work area, running lights, and a horn.
- Smoking is not permitted onboard the vessels.
- All crew members must be instructed so that they know the location and use of onboard safety equipment.
- For vessels less than 26 feet long, at least one fire extinguisher must be onboard. For vessels 26 feet or more in length but less than 40 feet, at least two fire extinguishers must be onboard.
- A life jacket must be worn by crew members at all times while working on boats, piers, or docks that are not equipped with guardrails.
- The VHF radio must be turned on and monitored.
- Crew members should not untie mooring lines until instructed to do so by the vessel operator.
- Crew member should never jump between the vessel and the dock.
- Docks should be approached slowly. The boat should never be fended off by placing your body between the boat and an object.
- All crew members should watch for hazards such as approaching vessels or wakes. It should never be assumed that other crew members see such hazards; therefore, they should be alerted to any potential risks that you observe.
- In case of a serious emergency such as fire or imminent sinking, the vessel should not be abandoned unless no other option is available. Preferably the boat should be run aground, or a rescue by another vessel should be attempted.

- Crew member should be aware of overhead power lines and underwater utility corridors.
- If lightning or thunder occurs, the 30/30 rule should be used. If the time between seeing lightning and hearing thunder is 30 seconds or less, the boat should be moved near a tall structure such as a bridge and remain there until 30 minutes after the last thunder is heard.
- If refueling is necessary, the engine should be turned off and allowed to cool before fueling is attempted.
- In case of oil spill, absorbent pads should be used to contain the spill. All oil spills must be promptly reported to the National Response Center (1-800-424-8802 or 202-267-2675).

Oversight management team members will not be operating small boats on this project; therefore, they will rely on the boat operators of the vessels they board to operate their boats safely and in accordance with U.S. Coast Guard regulations, as well as the safe maintenance, operation, and inspection practices in the previous list. Oversight management personnel will not board or work from vessels that do not meet these requirements.

4.2.6 Diving

As indicated in Section 2.0, commercial divers will conduct visual surveys of the pilot plots, install and retrieve porewater samplers, and collect bulk samples of the sediments before and after cover placement. This diving work will be conducted by a specialty contractor without direct involvement by the oversight management team. Therefore, this site-specific HASP does not address the hazards and controls associated with this diving work. Nonetheless, oversight management (Amec Foster Wheeler) will require that the diving contractor provide a site-specific diving HASP and comply with all applicable requirements of Washington Department of labor & Industries Standards for Commercial Diving Operations (WAC 296-37) and provide a safe practices manual for each diving mode per WAC 296-37-530 before beginning diving operations. This manual must include the following:

- Safety procedures and checklists for diving operations
- Assignments and responsibilities of the dive team members
- Equipment procedures and checklists
- Emergency procedures for fire, equipment failure, adverse environmental conditions, and medical illness and injury

In addition, the contractor will produce a site-specific dive plan for each diving operation that specifies the means and methods that will be used to comply with all required elements of DOSH's diving standard, the main requirements of which state the following:

- All diving activities must be conducted with two comparably equipped scuba divers in the water in constant communication or by surface-supplied air divers who are continuously tended and in two-way voice communication with a surface dive team member. A standby diver will also be in attendance during all dives.
- All diving will be from boats.
- No night diving will be conducted.
- All diving will be conducted with scuba equipment or with surface-supplied air diving apparatus. Decompression dives are not permitted. A depth-time profile, including any breathing gas changes, must be maintained for each diver during the dive.
- No diving will be conducted in enclosed or physically confining spaces.
- No diving will be conducted against currents exceeding 1 knot unless line-tended.
- No diving will take place if surface visibility is less than 200 feet at that particular location.
- The diver must terminate a scuba dive while there is still sufficient cylinder pressure remaining (generally, 500 pounds per square inch [psi]) to allow the diver to safely reach the surface.
- Dives must also be terminated whenever communication is lost with the diver, the diver fails to respond to a communication, or the diver requests that the dive be terminated.
- Surface-supplied air diving operations must have a primary breathing gas supply sufficient to support divers for the duration of the planned dive including decompression. A diver-carried reserve breathing gas supply must be provided whenever the diver is prevented by the configuration of the dive area from ascending directly to the surface.

A list of the telephone or call numbers of the following must be kept at the dive location: an operational decompression chamber, accessible medical facility, available physician, available means of transportation, and the nearest U.S. Coast Guard Rescue Coordination Center.

A first aid kit appropriate for the diving operation and approved by a physician must be available at the dive location along with an American Red Cross standard first aid handbook.

Each diver must possess a nationally recognized diving certificate. Each diver will be assigned tasks in accordance with his or her experience and training. Each diver must be trained, qualified,

and authorized for the diving mode and specialized equipment being used, the diving activity to be performed, and the depths at which the dive is to be conducted.

All dive team members must be trained in CPR and first aid (American Red Cross standard course or equivalent).

The planning of each diving operation will include an assessment of the health and safety aspects of each task. The planning elements will include the following:

- Diving mode
- Surface and underwater conditions and hazards
- Breathing gas supply (including reserves)
- Thermal protection
- Diving equipment and systems
- Dive team assignments and physical fitness of dive team members
- Emergency procedures
- Coordination with other activities in the vicinity that could potentially interfere with the diving operation

5.0 SITE CONTROL MEASURES

The work areas that oversight management personnel will be visiting when they perform their site inspections will be managed and controlled by the contractors who are performing the work. Therefore, site control measures for these areas will be provided in the respective site-specific HASPs submitted by the contractors in charge of the work. When inspecting active work areas at the pilot plots, oversight management personnel will comply with all PPE requirements; site access restrictions; vessel operation, emergency response, and decontamination procedures; and communication protocols established by the vessel operator and study area construction contractors. They will familiarize themselves with applicable sections of the contractor's site-specific HASP and participate in on-site health and safety briefings and emergency drills, such as, man overboard, fire, and emergency evacuation exercises. Oversight management personnel will also maintain direct line of sight or immediate verbal communications with at least one other site worker at all times while working on site and have ready access to off-site communications by telephone or radio in the event of an emergency. They will note the location of all emergency telephone numbers and equipment, such as, PFDs, life rings, fire alarms, fire extinguishers, man overboard retrieval gear, first aid kits, and spill response equipment. As a minimum, oversight

management personnel will wear hard hats, safety glasses with side shields, hearing protection (as needed), high-traction steel-toed boots, reflective safety vests, and PFDs when working on open vessel decks that are unequipped with guardrails.

The DOF oversight personnel are not expected to come into close contact with site contaminants during their work because they will only be observing site operations. However, if they must enter contaminated areas to perform their work and they become contaminated, they will undergo personnel decontamination in regulated decontamination areas (contamination reduction zones [CRZs]) established by the contractor in control of the job site. The location and operation of these CRZs will be described in the individual site-specific HASPs submitted by each contractor participating in the project.

6.0 COMMUNICATIONS

Communications at the job site will be by verbal command, hand signals, radio, or a combination of all three. Oversight personnel will carry cellular telephones and a list of emergency telephone numbers. These telephone numbers are listed in Section 8.0 of this plan.

Boat operators will have VHS radios that are capable of communicating with U.S. Coast Guard emergency services and with other boats operating in the immediate work area. An air horn will be staged at each work area to initiate an evacuation of the site in an emergency should other means of communication (i.e., radio, telephone, etc.) fail. Evacuation procedures are described in Section 13. Site personnel will be informed of site emergency procedures and communication protocols during their initial site orientation.

7.0 TRAINING REQUIREMENTS

7.1 GENERAL SITE WORKER TRAINING

Oversight management personnel will have received 40 hours of general site worker training per WAC 296-843 before beginning work. The SHSO will also complete an additional 8 hours of relevant supervisory health and safety training. Those employees who complete this training more than 12 months before the start of the project will have completed an 8-hour refresher course within the past 12 months.

A copy of the training completion certificates for each field oversight management team member will be maintained at the site. All oversight management personnel will receive site orientation training as described in Section 8.2. At least two site workers who have current first aid/CPR training will be on site at all times when work is underway. The names and telephone numbers of

all first aid/CPR-qualified site personnel will be posted at the site. The aforementioned training requirements and other mandatory training and certifications required for this project are summarized in Table 2.

TABLE 2

TRAINING REQUIREMENTS FOR OVERSIGHT MANAGEMENT PERSONNEL

Personnel	Requirements
Oversight management personnel	40-hour general site worker training, current 8-hour refresher training, and site orientation training
Site health and safety officer	40-hour general site worker training, 8-hour supervisor training, site orientation training, and first aid/CPR training
At least two workers on site	First aid/CPR and blood-borne pathogens

7.2 SITE-SPECIFIC ORIENTATION TRAINING

The SHSO will provide and document site-specific orientation training during the project kickoff meeting and whenever new oversight workers arrive on site. No worker will be allowed to begin work on site until the site-specific training is completed and documented by the SHSO. This training will address this site-specific HASP and all health and safety requirements and procedures pertinent to site operations.

As part of the site-specific orientation training, the following topics will also be covered:

- Project introduction and orientation
- Potential site hazards and controls (chemical, physical, and biological)
- Hazard communication for chemicals brought onto the site
- Selection, use, and limitation of PPE
- Emergency procedures
- Blood-borne pathogen briefing
- Content of the site-specific HASP

7.3 SAFETY MEETINGS

The SHSO will conduct site safety meetings for project personnel each time they visit the site. During these sessions, workers will be encouraged to share their observations, thoughts, and experiences on health and safety issues that are pertinent to the job site. This venue also allows site management to share important hazard communication topics with the workers, such as,

required use of PPE, decontamination procedures, emergency procedures, safe work practices, and changes to the site-specific HASP, to name a few.

The SHSO will conduct these briefings, or oversight management personnel will attend the safety briefings conducted by the contractor in charge of the work areas they will be visiting. Site briefings may be conducted anytime if new hazards arise that must be communicated expeditiously to site personnel or if new workers arrive on site. A site briefing form will be used to document these meetings and will include a list of topics discussed, hazards identified, recommended remedial controls, other pertinent issues, and the names of all attendees (Attachment C). The information gathered during these sessions will be used to correct any unsafe conditions or work practices at the job site and amend the site-specific HASP as appropriate. Copies of the site briefing forms will be maintained at the job site.

7.4 HAZARD COMMUNICATIONS

Safety Data Sheets (SDS) will be kept on file at the job site for each hazardous chemical used by oversight management team members during the project. These SDSs will be made available to each applicable employee on request. Employees will also be informed about any site operations involving the use of hazardous chemicals, the hazardous nature of the chemicals used, and the location of the SDSs. Workers who will be exposed to hazardous chemicals will be trained to recognized chemical contact hazards in the workplace, the physical properties and health hazards of hazardous chemicals, and the personal protective measures that will be taken to control exposures. All chemical containers used to store hazardous chemicals will also be marked or labeled with the name of the chemical and its hazard warning.

8.0 MEDICAL SURVEILLANCE

Because oversight management personnel are not expected to be exposed to site contaminants in at concentrations in excess of their respective permissible exposure limits, they are not required to be enrolled in a medical surveillance program for this project. However, any team members who have a known medical condition that puts them at risk of injury related to their assigned work must disclose this condition to site management so that accommodations can be made to ensure that their work can be conducted in a safe and healthful manner.

9.0 PERSONAL PROTECTIVE EQUIPMENT

The PPE to be used will be selected to protect oversight management personnel from the potential exposure hazards they are likely to encounter as identified in Section 5.0 of this plan. Due to the nature of the tasks involved and the size of the site, the SHSO will review work assignments daily

and choose the appropriate PPE based on the operation, the location, and the hazards involved in each task. The level of PPE protection will be upgraded or downgraded based on changes in site conditions. Factors that may indicate the need to reevaluate site conditions and PPE selection include the following:

- Discovery of previously unidentified contaminants
- Commencement of a new work phase
- Change in job tasks during a work phase
- Change of season/weather

Two levels of PPE will be available for use during the planned project activities: Level D and modified Level D. The PPE components that make up these levels are discussed in Sections 10.1 and 10.2.

Visitors to the site will be escorted at all times and kept well away from hazardous or restricted work areas. Therefore, they will not be required to wear the PPE specified in Section 10.1 and 10.2. However, it is recommended that visitors wear hard hats, safety glasses, and reflective work vests while on site.

9.1 LEVEL D

As a minimum, all oversight management personnel, except those entering regulated work areas where significant dermal contact with site contaminants is likely, will wear Level D PPE consisting of the following:

- Cotton coveralls or standard work clothing, a hard hat, and safety glasses with side shields
- Leather work boots with steel toes
- Hearing protection as needed
- PFDs for those working in boats, on unguarded sections of docks, and over water
- High-visibility traffic vests if not wearing reflective PFDs

9.2 MODIFIED LEVEL D

Modified Level D PPE will be worn by team members who will come into direct contact with contaminated sediments, as required by the contactor controlling the work areas they will be visiting. Modified Level D PPE will consist of the following items:

- Disposable Tyvek coveralls or lightweight polyvinyl chloride (PVC) rain gear
- Chemical-resistant gloves and PVC steel-toed boots
- Hard hat
- Safety glasses with side shields
- Hearing protection as needed
- U.S. Department of Transportation–approved high-visibility safety vest if not wearing reflective PFDs
- PFD with attached whistle for those working in boats, on unguarded sections of docks, and over water

Modified Level D PPE will be worn when their monitoring activities put a team member at risk of incurring significant exposure to contaminated sediments It is unlikely that oversight management personnel will be required to wear respiratory protective equipment and associated protective clothing (Level C). This would be necessary only if required by a contractor in control of a particular work area that oversight management team members must enter. Should the use of respirators become necessary, this site-specific HASP will be amended to include requirements for fit testing, inspection, selection, use, limitations, maintenance, and storage of respiratory equipment as mandated by the respiratory protection standard of the Washington Industrial Safety and Health Act (WISHA).

Visitors to the site will be escorted at all times and kept well away from hazardous or restricted work areas. Therefore, they will not be required to wear the PPE specified in Section 10.1 and 10.2. However, it is recommended that visitors wear hard hats, safety glasses, and reflective work vests while on site.

10.0 DECONTAMINATION

Decontamination for site personnel wearing Level D PPE will consist of having all workers remove their hard hats, safety glasses, hearing protection, PFDs, and outer protective garments before leaving the site and storing them in a clean area for reuse the next day.

Site personnel contacting contaminated sediments while wearing Modified Level D PPE will be required to have their boots and gloves washed, rinsed, and removed before leaving the site. They will also remove their Tyvek coveralls and place them in a plastic bag for disposal. Reusable PVC rain gear, if worn, will be rinsed clean with water, removed, and stored on site for later use.

Personnel decontamination will be conducted in a CRZ situated adjacent to and contiguous with the regulated work area. A large wash tub will be placed in the CRZ for workers to stand in while their outer protective clothing is washed and rinsed. Scrub brushes and soap solution may be used to remove mud and soil from clothing. All wash and rinse water will be disposed of in accordance with the waste management practices described in the construction quality assurance project plan for the project.

The SHSO will ensure that the above-mentioned decontamination procedures are effectively controlling the spread of contamination in the work area by periodically inspecting the recently cleaned clothing and equipment for evidence of residual contamination. The work area will also be examined to detect any sign of contamination outside the work zones. Should it become apparent that contamination is being dispersed into clean areas of the site, access to contaminated areas will be restricted until more effective decontamination methods can be devised.

11.0 AIR MONITORING

It is unlikely that oversight management personnel will be exposed to site contaminants at concentrations greater than their respective permissible exposure limits during their site inspections; therefore, no special air monitoring requirements are needed for their work. Nonetheless, all site assessment contractors in control of the work area will be expected to evaluate site conditions at their job sites and inform oversight management team members of any potential exposure hazards so that appropriate air monitoring and exposure control measures can be implemented if and when they enter these areas.

12.0 EMERGENCY RESPONSE

Because the project responsibilities are limited primarily to oversight management, the risk of encountering a significant emergency associated with the work is minimal. However, oversight management personnel will be working in regulated areas controlled by other site contractors where workplace hazards do exist and emergencies could occur. In these cases, oversight management team members will comply with the emergency procedures established by the contractors controlling their own job sites. These discrete emergency procedures will be included in each contractor's site-specific HASP, which will be thoroughly reviewed by oversight management personnel before they are allowed to enter the contractor's work areas.

There is also a possibility that oversight management personnel could experience a medical emergency in the normal course of their work or, perhaps, encounter a fire or hazardous material spill. For such emergencies, this section of the site-specific HASP constitutes the emergency response plan. It will be discussed with all oversight management personnel during their initial site

orientation training and rehearsed periodically throughout the duration of the project. The rehearsal will include a staged personnel injury and/or fuel spill or fire. At the completion of the emergency response exercise, the project manager and the SHSO will evaluate the effectiveness of the emergency response procedures and amend the site-specific HASP as appropriate.

A copy of the emergency response plan (this section) and a map to the emergency medical facility (Attachment D) will be posted at the site.

The emergency response contacts for this project are indicated in Table 3.

TABLE 3

EMERGENCY RESPONSE CONTACTS

Site Address: (locations of job sites have not yet been defined)	
Medical Facility:	
U.S. HealthWorks Medical Group Clinic 3223 First Avenue South, Suite C Seattle, WA 98134	206-624-3651
EMT/ambulance	911
King County Sheriff's Department:	
Emergency	911
Business	206-296-3333
Seattle Fire Department:	
Emergency	911
Business	206-386-1400
U.S. Coast Guard	206-217-6000 or VHF channel 16
National Response Center	1-800-424-8802
Washington Emergency Management Division	1-800-258-5990
Washington Poison Center	1-800-222-1222
Agency for Toxic Substances and Disease Registry	1-888-422-9737
Washington State Department of Ecology	1-800-258-5990
Vessel Assist (private vessel rescue services)	1-800-391-4869
Amec Foster Wheeler project manager, Cliff Whitmus	Cell: 206-300-0520
Amec Foster Wheeler project health and safety officer, Tim Reinhardt	Cell: 425-241-5816
Amec Foster Wheeler West U.S. health and safety manager, Chad Barnes	Cell: 480-495-9846
Dalton, Olmsted & Fuglevand, Inc., field technical lead/site health and safety officer, Rich May	Cell: 360-621-9505

12.1 EMERGENCY COORDINATOR

The SHSO will be the designated emergency coordinator responsible for implementing this emergency response plan. He will notify emergency responders (ambulance, medical facility, etc.) during a medical emergency or spill/fire incident and ensure that the client and all affected project contractors are made aware of any emergencies occurring on site. He will initiate emergency evacuation procedures, as appropriate, and ensure that injured oversight management personnel are given emergency medical treatment and transported to the medical facility for follow-up treatment.

The emergency coordinator will conduct an inspection of emergency response equipment every month. This equipment includes fire extinguishers, first aid kits, and spill control equipment. As part of the daily site walk-through, he will pay close attention to potential fire hazards, spill potentials, and individual work practices. Emergency response equipment will be stored at the waterway access dock. The monthly fire extinguisher checks will be documented, either on the fire extinguisher or in the SHSO logbook.

12.2 SITE EVACUATION

Should a serious or catastrophic situation arise on site, such as but not limited to, an uncontrollable fire, airborne release of flammable or toxic chemical, hazardous liquid spill on the waterway, significant injury of site personnel, or major earthquake or explosion, the job site will be evacuated. Site personnel will be notified of an evacuation either by direct radio communications or by air horn signals. Air horns will be staged at each major work area.

If an evacuation is necessary, the emergency coordinator will sound three long blasts on the air horn, and then all site personnel will proceed immediately to a designated assembly area. A head count of all assembled site personnel will be taken by the emergency coordinator. Once everyone is accounted for, they will evacuate farther to the safe area designated during the site orientation training, and the emergency coordinator will assess the situation and outline the actions to be taken. One long blast of the horn will be the “all clear” signal, indicating that personnel can once again reenter the site and resume work.

During the emergency, the emergency coordinator will:

- Ensure injured personnel are given first aid treatment, as appropriate.
- Shut down equipment that could cause a hazard or act as an ignition source.
- Notify applicable emergency response services.

- Prohibit unauthorized personnel from entering the evacuated area.
- Provide emergency equipment as appropriate.
- Notify the project manager and client of the incident.

12.3 ENVIRONMENTAL INCIDENT (SPILL)

All contractors working on site will be responsible for containing, controlling, and cleaning up any spills they create. Oversight management personnel will not be engaged in any work activities that could result in the release of hazardous materials into the environment. If oversight management personnel encounter a spill created by others, they will immediately notify the contractor in charge of the spill area so they can initiate a cleanup action.

12.4 EXPLOSIONS

In the event of an explosion, all nonessential personnel will be evacuated from the site and the work area will be secured. No one will be allowed to reenter the site, except to possibly save a life, until cleared by the emergency coordinator. If adjacent properties are threatened by the explosion, local emergency response authorities will be called to evaluate the situation and possibly initiate an evacuation of the surrounding community.

12.5 PERSONAL INJURY

In the event of serious personnel injury (fatality, unconsciousness, possibility of broken bones, severe bleeding, burns, blood loss, shock, or trauma), the first person on the scene will immediately:

- Administer first aid if qualified; if not qualified, seek out a person qualified to administer first aid.
- Notify the emergency coordinator of the name of the injured party, his or her location, and the nature of the injury.

The emergency coordinator, upon receipt of notification of the injury, will immediately:

- Notify emergency response services and provide the appropriate information about and location of the injured party.
- Assist the injured party as deemed appropriate.
- Designate someone to accompany the injured party to the medical facility and to provide Material Safety Data Sheets (if applicable) to the emergency medical team.
- Notify the project manager.

- Complete an injury report.

If the emergency coordinator determines that emergency medical services are not necessary (minor injury such as sprain or abrasion or patient is conscious and can be moved), he may direct someone to transport the injured party by vehicle to the medical facility. A map showing the medical facility will be located in the office trailer and all major work areas.

12.6 ADVERSE WEATHER

Weather conditions in Washington are typically punctuated by severe winds and rain. In the event of adverse weather, the SHSO working with the King County project representative will determine whether work can continue without compromising the health and safety of field personnel. Conditions to be considered before determining whether work should continue include the following:

- Extreme cold and wind
- Heavy precipitation
- Limited visibility
- Potential for accidents

12.7 EMERGENCY EQUIPMENT

The following emergency response equipment will be stored at the DOF's onshore office:

- First aid kits for 10 people
- Ten-pound ABC fire extinguishers (to be inspected monthly)
- An air horn
- Portable, emergency eyewash
- Spill equipment (as mentioned in Section 13.3)
- Cellular telephones and/or radios

This equipment will be inspected monthly by the SHSO. It will be cleaned, inspected, and replenished immediately after each use.

Postings related to the emergency response plan will be placed in the office trailer and each major work area. The following information from the emergency response plan will be highlighted on these postings:

- Emergency telephone numbers for fire, ambulance, medical facilities, and police
- Location of fire extinguishers and emergency equipment
- Map to the medical facility

13.0 REFERENCE

Windward Environmental, LLC (Windward). 2015. Memorandum: Validated LDW Sediment Data for ENR-AC Pilot. Prepared for U.S. Environmental Protection Agency and Washington State Department of Ecology. Prepared by the Lower Duwamish Waterway Group.

14.0 HEALTH AND SAFETY PLAN CERTIFICATION

By their signature, the following undersigned individuals certify that this plan has been read or otherwise communicated to them. They further certify that they completely understand this plan and will follow its procedures for the protection of the health and safety of all persons entering this site.

Name (Printed)	Signature	Company	Date

ATTACHMENT A

Activity Hazard Analysis Table

ACTIVITY HAZARD ANALYSIS

Project: Enhanced Natural Recovery/Activated Carbon Pilot Study		**Location: Lower Duwamish Waterway**
Activity: General Oversight Management		**Approved by: _____**
PRINCIPAL STEPS	**POTENTIAL SAFETY/ HEALTH HAZARDS**	**RECOMMENDED CONTROLS**
Working near heavy equipment operations	Being struck by heavy equipment or other vehicles operating at the site	- Maintain eye contact with operators before approaching equipment. - Do not approach equipment from blind spots. - Do not enter vehicle traffic lanes or control zones established around mechanical equipment. - Do not stand behind mobile equipment and be mindful of backup alarms. - Wear U.S. DOT-approved high-visibility safety vest when working around mobile equipment. - Stay out of area between moving equipment and other fixed objects. - Stay out from underneath hoisted loads. - Wear hard hat, steel-toed boots, and safety glasses at all times.
	Contact with exposed gears or pulleys	- Inspect mechanical equipment for unguarded moving parts and inform responsible contractor of hazard. - Maintain safe distance from unguarded mechanical equipment until hazard can be corrected. - Ensure area around equipment is secured and hazard warning signs are displayed or have defective equipment taken out of service.
	Noise	- Collect sound level measurements in the work area, as necessary. - Wear hearing protection if noise levels exceed 85 decibels. - Have regulated areas established around high-noise areas and post noise warning signs. - Implement hearing conservation measures for employees exposed to noise levels in excess of 85 decibels
	Being struck by flying debris	- Wear impact-resistant, ANSI-approved safety glasses with side shields.
Walking/working at ground level	Slips or trips on equipment and debris left on the ground	- Clear work area and walkways of debris. - Wear high-traction, safety-toe footwear. - Keep walkways dry or surface with slip-resistant materials. - Post exit signs and evacuation routes. - Ensure portable ladders are properly placed and secured. - Inspect work areas daily.

ACTIVITY HAZARD ANALYSIS

Project: Enhanced Natural Recovery/Activated Carbon Pilot Study **Activity: General Oversight Management**		**Location: Lower Duwamish Waterway** **Approved by: _____**
PRINCIPAL STEPS	**POTENTIAL SAFETY/ HEALTH HAZARDS**	**RECOMMENDED CONTROLS**
Walking/working at ground level (continued)	Being struck by dropped, flying objects	- Wear ANSI-approved hard hat, safety glasses, safety-toe footwear.
	Slips/trips/falls while changing elevations	- Provide stairs, ladders, or ramps when elevation changes greater than 19 inches are necessary. - Use three-points-of-contact ascending and descending stairs and ladders.
	Falls to lower level, e.g., through open hatches or from docks or overwater platforms, etc.	- Have vessel operators close all open hatches. - Do not approach openings unless they are appropriately guarded. - Wear PFD when working onboard vessels, on docks, or on overwater platforms that are unguarded.
	Inadequate communications	- Carry a portable radio and cell phone at all times to communicate with site contractors, site security, and main office.
Walking/working at elevations	Falls from elevations	- Do not use elevated (more than 6-foot high) catwalks, aisleways, stairways, or work platforms that are unequipped with guardrails. - Do not use unguarded, fixed ladders. - Ensure all floor openings are covered before accessing work areas. - Have elevated surfaces that are not designed as work platforms evaluated by a qualified person for structural capacity before using as a work platform.
Working outside in the natural environment	Thermal (heat and cold) stress	- Monitor environmental temperatures and level of work activity. - Track thermal loads. - Provide shaded rest areas, water, and work-rest cycles during conditions conducive to heat stress. - Wear thermally insulted clothing during conditions conducive to cold stress. - Inform personnel of thermal stress symptoms, treatments, and controls (see Section 5.2.3 of site-specific HASP). Use “buddy system” to monitor team members for thermal stress.

ACTIVITY HAZARD ANALYSIS

Project: Enhanced Natural Recovery/Activated Carbon Pilot Study		**Location: Lower Duwamish Waterway**
Activity: General Oversight Management		**Approved by: _____**
PRINCIPAL STEPS	**POTENTIAL SAFETY/ HEALTH HAZARDS**	**RECOMMENDED CONTROLS**
Working from small boat	Overboard falls and drowning	- Ensure boat has guardrails as appropriate. - Do not stand or lean over edge of boat. - Rehearse man overboard drill. - Ensure that water rescue is available. - Ensure that vessel has at least one throwable PFD (Type IV PFD) with 90 feet of line attached. - While onboard vessel, wear a PFD.
	Collisions with other boats operating in area	- Maintain vigilance and ensure boat has proper running lights. - Notify other site contractors of work location. - Comply with U.S. Coast Guard right-of-way rules. - Use horn to signal or warn other boats as appropriate. - Suspend work during bad weather or poor visibility. - Have experienced boat crews operate vessel.
	Vessel mechanical failure or onboard emergency (i.e., fire, loss of power, breach of hull, etc.)	- Inspect vessel for mechanical integrity before each use. - Communicate fire and emergency evacuation procedures to all boat occupants. - Ensure that radio communications with U.S. Coast Guard are available. - Ensure that emergency flares, life rings, and life vests are available. - Verify presence and working order of fire extinguishers.
	Heavy lifting	- Limit lifting to 50 pounds/person or less. - Use proper lifting techniques. - Use mechanical equipment when feasible. - Have others help lift heavy loads.
	Dermal contact with contaminated sediments	- Wear modified Level D PPE if necessary.
	Thermal (heat and cold) stress	- Wear thermally insulated clothing as appropriate. - Wear rain gear when needed. - Take frequent warm-up breaks in heated boat cabin or car. - Review thermal stress treatments and controls with personnel. - See Section 5.2.3 of site-specific HASP. - Keep dry.

ACTIVITY HAZARD ANALYSIS

Project: Enhanced Natural Recovery/Activated Carbon Pilot Study		**Location: Lower Duwamish Waterway**
Activity: General Oversight Management		**Approved by: _____**
PRINCIPAL STEPS	**POTENTIAL SAFETY/ HEALTH HAZARDS**	**RECOMMENDED CONTROLS**
Working from small boat (continued)		- Assume overboard victims are hypothermic and treat as such. - Take frequent rest breaks in shaded areas to control heat stress. - Drink plenty of fluids.
	Contact with exposed gears, pulleys, and other rotating or reciprocating mechanical equipment	- Ensure that all mechanical equipment with exposed gears, pulleys, and other rotating or reciprocating parts are guarded, isolated, or taken out of service. - Keep hands and fingers away from actuating mechanisms on sediment sampling equipment. Use safety locking devices or pins when handling this equipment.
	Being struck by hoisted loads	- Stay clear of hoisted loads. - Use tag lines to direct placement of hoisted loads. - Do not operate davits or winches in heavy seas when boat is pitching and listing. - Secure loads that are brought onboard boat. - Stow lines and other trip hazards on deck. - Keep hands out of pinch or crush points when handling hoisted loads or stowing equipment. - Wear hard hat.
Observing ENR and ENR+AC construction work from crane barge	Overboard falls and drowning	- Wear PFD when working on areas of the barge that do not have guardrails. During night operations, wear a reflective PFD equipped with flashing beacons. - Inform barge crew of your whereabouts at all times. Carry a portable radio and cell phone for communications at all times. - Do not stand or lean over edge of barge. - Rehearse man overboard drill. - Ensure that a rescue skiff is available at the barge. - Ensure that vessel has at least one throwable PFD (Type IV PFD) with 90 feet of line attached. - Do not work alone. Observe the "buddy rule."

ACTIVITY HAZARD ANALYSIS

Project: Enhanced Natural Recovery/Activated Carbon Pilot Study **Activity: General Oversight Management**		**Location: Lower Duwamish Waterway** **Approved by: _____**
PRINCIPAL STEPS	**POTENTIAL SAFETY/ HEALTH HAZARDS**	**RECOMMENDED CONTROLS**
Observing ENR and ENR+AC construction work from crane barge (continued)	Being struck by crane	- Remain clear of swing radius of excavator/crane bucket and counterweight. - Maintain eye contact with crane operator when approaching equipment. - Ensure that work areas on barge are adequately lighted. - Wear high-intensity work vest, as well as, hard hat, steel-toed boots, and safety glasses when working onboard vessel.
	Contact with exposed gears or pulleys	- Inspect mechanical equipment for unguarded moving parts and inform barge crew of hazard. - Maintain safe distance from unguarded mechanical equipment until hazard can be corrected. - Stay clear of deck lines under tension and other exposed pulleys, shackles, and pinch/grab points.
	Noise	- Collect sound level measurements in the work area. - Wear hearing protection if noise levels exceed 85 decibels. - Implement hearing conservation measures for employees exposed to noise levels in excess of 85 decibels.
	Being struck by flying debris	- Wear impact-resistant, ANSI-approved safety glasses with side shields.
Observing cap construction work from crane barge	Falls from elevations	- Do not use elevated (more than 6-foot high) catwalks, aisleways, stairways, or work platforms that are unequipped with guardrails. - Do not use unguarded, fixed ladders. - Ensure that all hatches are closed before accessing work areas. - Have elevated surfaces that are not designed as work platforms evaluated by a qualified person for structural capacity before using as a work platform.
	Thermal (heat or cold) stress	- Monitor environmental temperatures and level of work activity. - Track thermal loads. - Provide shaded rest areas, water, and work-rest cycles during conditions conducive to heat stress.

ACTIVITY HAZARD ANALYSIS

Project: Enhanced Natural Recovery/Activated Carbon Pilot Study **Activity: General Oversight Management**		**Location: Lower Duwamish Waterway** **Approved by: _____**
PRINCIPAL STEPS	**POTENTIAL SAFETY/ HEALTH HAZARDS**	**RECOMMENDED CONTROLS**
Observing cap construction work from crane barge (continued)		- Wear thermally insulted clothing during conditions conducive to cold stress. - Inform personnel of thermal stress symptoms, treatments, and controls (see Section 5.2.3 of site-specific HASP.

Abbreviations:
ANSI = American National Standards Institute
DOT = Department of Transportation
PFD = personal flotation device

ATTACHMENT B

General Site Work Rules

GENERAL SITE WORK RULES

1. Oversight management personnel must attend weekly site briefings and other scheduled meetings.
2. Any individual taking prescribed drugs must inform the site health and safety officer (SHSO) of the type of medication and any possible adverse side effects that could affect the health and well-being of the worker while performing his or her jobs. The SHSO will decide whether the employee can safely work on site while taking the medication.
3. The personal protective equipment (PPE) specified by the SHSO and in the site-specific health and safety plan(s) (HASP[s]) must be worn by oversight management personnel. This includes hard hats, safety glasses, and steel-toed boots, as a minimum.
4. Facial hair (beards, long sideburns, or mustaches) that may interfere with a satisfactory fit of a respirator mask is not allowed on any person who may be required to wear a respirator.
5. All personnel must sign the site log when visiting the job site.
6. Personnel must follow proper decontamination procedures.
7. Eating, drinking, chewing tobacco or gum, smoking, and any other practice that may increase the possibility of hand-to-mouth contact is prohibited in regulated areas of the job site.
8. All lighters, matches, cigarettes, and other forms of tobacco are prohibited in regulated areas of the job site.
9. All signs and demarcations must be followed. Such signs and demarcation must not be removed except as authorized by the site superintendent.
10. No one will enter a permit-required confined space without approval from the site superintendent and SHSO.
11. All personnel must use the “buddy system” when working in regulated areas.
12. All personnel must follow the work-rest regimens and other practices to minimize heat stress.
13. All personnel must follow lockout/tagout procedures when working on equipment involving moving parts or hazardous energy sources.
14. No person will operate equipment unless trained and authorized.
15. Ladders must be solidly constructed, in good working condition, and inspected prior to use. No one may use defective ladders.

16. Fall protection or fall arrest systems must be in-place when working at elevations greater than 6 feet for temporary working surfaces and 4 feet for fixed platforms.
17. Safety belts, harnesses, and lanyards must be selected by the SHSO. The user must inspect the equipment prior to use. No defective personal fall protection equipment will be used. Personal fall protection equipment that has been shock loaded must be discarded.
18. Hand and portable power tools must be inspected prior to use. Defective tools and equipment will not be used.
19. Ground fault interrupters must be used for cord and plug equipment used outdoors or in damp locations. Electrical cords must be kept out of walkways and puddles unless they are protected and rated for the service.
20. Improper use, mishandling, or tampering with health and safety equipment and samples is prohibited.
21. Horseplay of any kind is prohibited.
22. Possession or use of alcoholic beverages or controlled substances on site is forbidden.
23. All incidents, no matter how minor, must be reported immediately to the site superintendent.
24. All personnel will be familiar with the site emergency response plan.
25. All personnel will report any unsafe conditions or practices to site management immediately upon discovery.

The above work rules are not all inclusive, and each employee is responsible for complying with all applicable regulations set forth by the Washington Industrial Safety and Health Act (WISHA), project management, the site-specific HASP, the client, Amec Foster Wheeler, the SHSO, and the controlling contractor's work rules and health and safety requirements.

ATTACHMENT C

Site Briefing Form

SITE SAFETY BRIEFING

Date: _____ **Time:** _____ **Location:** _____

Shift: _____ **Person Conducting Briefing:** _____

1. **HEALTH AND SAFETY CONCERNS** (i.e., use of PPE, chemical, physical, or biological hazards, unsafe conditions, unsafe work practices, communication problems, safety equipment, training issues, etc.):

2. **RECENT INCIDENTS** (i.e., near misses, first aid cases, serious injuries, environmental spills, etc.):

3. **HAZARD CONTROL MEASURES** (PPE changes, new site control requirements, recommended work practices, etc.):

4. **OTHER ISSUES:**

5. **ATTENDEES** (Print Name):

1.	7.
2.	8.
3.	9.
4.	10.
5.	11.
6.	12.

ATTACHMENT D

Map and Directions to Medical Facility

NOTE: TO BE DETERMINED
SPECIFIC JOB SITES HAVE NOT BEEN IDENTIFIED AT THIS TIME

ATTACHMENT E

Construction Monitoring Diving Health and Safety Plan

NOTE: TO BE PROVIDED

ATTACHMENT F

Construction Water Quality Monitoring Health and Safety Plan

NOTE: TO BE PROVIDED

ATTACHMENT G

Monitoring Diving Health and Safety Plan

NOTE: TO BE PROVIDED

ATTACHMENT H

Sampling Health and Safety Plan

NOTE: TO BE PROVIDED

ATTACHMENT I

Sediment Profile Imaging Health and Safety Plan

NOTE: TO BE PROVIDED