



June 30, 2011

Ms. Piper Peterson
Superfund Project Manager
ECL-111, Region 10
U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101

Subject: Transmittal of Health and Safety Plan
Terminal 117 EAA Pre-Design Data Needs

Dear Ms. Peterson:

Attached please find the revised Health and Safety Plan (HASP) for the Pre-Design Data Needs field work. I have attached a final version (no edits) and red line strike out version for your files/review. Hard copies will be distributed once we receive your acceptance of the revised HASP.

Thank you for providing comments on the T-117 Pre-Design Data Needs Work Plan HASP, comments emailed on June 16, 2011 from Travis Shaw. We have incorporated all of the comments into the revised document except for the comments identified in Table 1 below.

Table 1 - Response to June 16, 2011 Comments

| EPA Comment | Response |
|---|--|
| Comment 1: Having an AED onsite is now a "standard of industry" and has been required for Portland Harbor work. The HASP should be revised to require an AED onsite, with personnel trained in its use. (These are now in grocery stores, airports, etc.). Chances of reviving site personnel after a heart attack are much higher if a shock is delivered as quickly as possible, and before an ambulance could possibly arrive. This is why EPA field teams have AEDs for site work (e.g. OSCs, dive unit, Manchester etc.) | The requirement for having an AED on cleanup sites does not represent current industry practice. Neither Federal nor state regulations (OSHA and WA Labor and Industries) require an on-site AED. The current version of the USACE HS guidance document (EM 385-1-1) states that AEDs are highly recommended and placement should be preceded by an assessment of time and distance to emergency medical services. The project site is located in Seattle with numerous emergency services in very close proximity, including a walk in emergency clinic one block from the site (8720 14 th Ave South). Furthermore, the site has complete cellular phone coverage. Because of the proximity to emergency services and cellular phone coverage, an AED will not be required in the HASP. |

Table 1 - Response to June 16, 2011 Comments (continued)

| EPA Comment | Response |
|--|--|
| <p>Comment 2: Section 8.2. PFDs. More discussion should be provided if hydrostatic vests are considered for use, i.e. "HIT vests will be checked at the beginning of each day to verify the CO2 charge is in working order."</p> | <p>The project site is located on the bank of the LDW, 3.5 miles from the point of discharge into Elliot Bay. Because of the nature of the river near the site, the depth of the river, the proximity to land, the work schedules (time of year and water temperature) and the nature of the work, H.I.T vests will not be required for personnel working on our around the water. All PFDs brought onto the property for site work will meet US Coast Guard regulations. Further, any near or in-water related work activities will specify the need for a 'buddy system', as well as using a PFD.</p> |
| <p>Comment 6: Section 10.8 Biological hazards. Discussion should be added of CSO microbial contamination issues and how these will be handled for anyone that will be working in or near the River. King County CSO status can be viewed here: http://www.kingcounty.gov/environment/wastewater/CSOstatus.aspx</p> | <p>Project scope of work will include incidental contact with surface water with employees wearing at least Level D PPE. A CSO is not located in immediate vicinity of the project site. The nearest upriver CSO is between river mile 4.9 and 5. The most upriver edge of the site is at river mile 3.7; the nearest CSO (ID Number K044) is 1.2 miles away. There would be considerable dilution of any sewage released from a source in the river 1.2 miles away. Standard hygiene practices applied on any site and should be adequate to mitigate this hazard. Because of the incidental contact, the location of the site relative to the nearest CSO, and the existing requirements for hygiene, this hazard will not be added to the HASP.</p> |

Our current field schedule begins Wednesday, July 6 with sediment vibracore work. We would appreciate your acceptance of these revisions by that time. Please feel free to contact us if you have any questions or would like to discuss further.

Sincerely,



Roy Kuroiwa

Port of Seattle

Project Coordinator

206-787-3814

Kuroiwa.R@portseattle.org

Distribution List:

- Travis Shaw, USACE (electronic copy)
- Ticson Mach, Port of Seattle (electronic copy)
- Brett Richardson, City of Seattle (electronic copy)
- Grant Hainsworth, CRETE (electronic copy)
- Reid Carscadden, Integral (electronic copy)



**CRETE CONSULTING, INC.
SITE-SPECIFIC HEALTH AND SAFETY PLAN**

**PRE-DESIGN DATA NEEDS WORK PLAN ACTIVITIES
PORT OF SEATTLE, TERMINAL 117
EARLY ACTION AREA – SEDIMENT AND UPLAND AREAS
LOWER DUWAMISH WAY SUPERFUND SITE
8700 DALLAS AVENUE SOUTH
SEATTLE, WASHINGTON**

revision date:
June 26, 2011

CRETE Consulting, Inc. (CRETE) and EMB Consulting LLC (EMB Consulting) have developed this Site-Specific Health and Safety Plan (SSHSP) for use by CRETE, subcontractors, and visitors. CRETE and EMB claim no responsibility for its use by others. This plan covers activities with the potential for exposure to contaminated environmental media during the Pre-Design Data Needs Work Plan Activities project at the Port of Seattle, Terminal 1117 site at 8700 Dallas Avenue South in Seattle, Washington. This plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if conditions change. The intent of this plan is to meet the requirements of the Washington State Division of Occupational Safety and Health (DOSH) Hazardous Waste Operations Regulation (WAC 296-843). It is not intended to address normal safety practices on construction sites, such as those covered in the DOSH Safety Standards for Construction Work (WAC 296-155). These practices are covered in the Accident Prevention Plans or company Health and Safety Plans for each contractor on site.

Each subcontractor is still responsible for the health and safety of their own individual employees and subcontractors.

Plan Approval

PLAN PREPARED BY:



Elisabeth Black, CIH
EMB Consulting, LLC

June 26, 2011

Date

PLAN ACCEPTED FOR CRETE Consulting, Inc. BY:



Grant Hainsworth
Project Manager

June 26, 2011

Date

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APPENDIX B: Job Hazard Assessment

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FIGURES

Figure 1: Route-to-Hospital Map

Figure 2: Route-to-Walk-in Clinic Map



1.0 PROJECT CONTACTS AND EMERGENCY INFORMATION

SITE LOCATION: Port of Seattle, Terminal 117
8700 Dallas Avenue South
Seattle, Washington
(see Site Plan in Appendix A)

CRETE PROJECT MANAGER: Grant Hainsworth
253.797.6323

CRETE FIELD MANAGER: Geoff Saunders
206.383.9916

CRETE SITE SAFETY OFFICER: Geoff Saunders
206.383.9916

CRETE QUALITY ASSURANCE OFFICER: Jamie Stevens
206.799.2744

PORT OF SEATTLE CONTACT: Roy Kuroiwa
206.787.3814
206.310.7446 cell

PROJECT INDUSTRIAL HYGIENIST: Elisabeth Black, CIH
EMB Consulting LLC
206.915.2395

NEAREST HOSPITAL: **Harborview Medical Center**
325 9th Avenue
Seattle, Washington
206.223.3000
(See Figure 1)

OCCUPATIONAL MEDICINE CLINIC: **Sea Mar CHC–Seattle Clinic**
8720 14th Avenue South
Seattle, Washington
206.762.3730
(See Figure 2)



MINIMUM TRAINING REQUIREMENTS

All workers entering a designated **exclusion zone**, as described below, must have a current 40- or 24-hour training certificate in Hazardous Waste Operations or current 8-hour refresher. All workers on site will be required to have read and signed the Site-Specific Health and Safety Plan and attended a safety orientation. Specific types of site work, hazards, and training requirements are listed in the Job Hazard Assessment in Appendix B of this Plan.

The following table is intended to provide a summary of minimum levels of training for specific workers and job activities on site.

| Type of Work Involved | Minimum Level of Training |
|---|---|
| Laborers and Equipment Operators in the Exclusion Zones engaged in disturbance of contaminated media, evaluating potential employee exposures, and otherwise potentially contacting contaminated media where respiratory protection <u>is or may be required</u> . | <ul style="list-style-type: none"> • 40-Hour Hazardous Waste Operations Training and Current 8-Hour Refresher • Project Safety Plan including Health and Safety Orientation • Read/Sign Site-Specific Health and Safety Plan |
| Laborers and Equipment Operators in the Exclusion Zones engaged in excavation of contaminated soil, evaluating potential employee exposures, and otherwise potentially contacting contaminated soils so long as respiratory protection <u>is not required</u> . | <ul style="list-style-type: none"> • 24-Hour Hazardous Waste Operations Training and Current 8-Hour Refresher • Project Safety Plan including Health and Safety Orientation • Read/Sign Site-Specific Health and Safety Plan |
| Workers onsite in clean or support zones for more than 8 hours, such as laborers, repair persons, inspectors, etc. <i>Note:</i> None of these workers are permitted in any portion of the exclusion or contamination reduction zones. | <ul style="list-style-type: none"> • Project Safety Plan including Health and Safety Orientation • Read/Sign Site-Specific Health and Safety Plan |



2.0 PURPOSE

This Site-Specific Health and Safety Plan (Plan) provides guidance to CRETE Consulting, Inc. (CRETE) and their subcontractors conducting work on the Port of Seattle Terminal 117 Pre-Design Data Needs Work Plan project in Seattle, Washington. This plan discusses potential chemical and physical hazards anticipated on site and includes control measures to ensure individual safety. This Site-Specific Health and Safety Plan applies to CRETE personnel, their subcontractors, and all other personnel entering the site and engaging in these activities.

This plan was developed based upon the information provided to EMB Consulting LLC (EMB Consulting) by CRETE Consulting. Because of the unknown nature of contaminants that might be present, it is not possible to address in advance all specific situations that might occur. As new information is discovered, it is intended that this Site-Specific Health and Safety Plan will be modified and/or amended to address such information. CRETE and EMB must approve all modifications and amendments.

Any questions about the applicability of this plan should be addressed to Jamie Stevens, Quality Assurance Officer for CRETE or Elisabeth Black, CIH of EMB Consulting.

3.0 SUBCONTRACTOR DISTRIBUTION / ACKNOWLEDGMENT

As required by regulation, the Site Safety Officer (SSO) will make available a copy of this Site-Specific Health and Safety Plan to subcontractors hired by CRETE working in contaminated areas and others who may enter the site. Subcontractors and others will read, sign, and return the attached acknowledgment form (Appendix D) and follow these provisions as minimum requirements. Due to their unique work activities, some subcontractors may need to follow more stringent health and safety measures in accordance with applicable regulations (e.g. heavy equipment operation safety, barge operation, etc.). It is anticipated that subcontractors will manage the hazards specific to their trade and equipment, as detailed in each contractor's Accident Prevention Plan or company Health and Safety Plan.

4.0 DESCRIPTION OF SITE TASKS

This Site-Specific Health and Safety Plan is intended to cover activities in areas where contamination may be encountered at the Port of Seattle Terminal 117 site in Seattle, Washington. These activities include:

- Mobilization to the site and driving on the site;
- Geotechnical borings;
- Investigation of shoreline seeps;
- Geoprobe, test pits, and vibracore sampling to collect soil data;
- Hazardous building materials assessment for three buildings and structures on site;
- Subsurface mapping;



- Clearing vegetation for site surveys;
- Habitat survey and wetland delineation; and
- Archaeological monitoring.

A job hazard assessment that evaluates the hazards associated with each of these tasks is included with this Plan as Appendix B.

5.0 SITE CHARACTERISTICS

5.1 Site Location and Description

The T-117 site is located on the west bank of the Lower Duwamish Waterway (LDW), between approximately River Mile (RM) 3.5 and RM 3.7 (relative to the southern tip of Harbor Island). The site sits approximately 6 miles south of the Seattle downtown area and is across the LDW from Boeing Plant 2 and Jorgensen Forge. The T-117 Sediment and Upland Area are located within a narrow strip of unincorporated King County that lies between the waterway to the east and the South Park neighborhood of Seattle to the west. The T-117 Upland Area is located at 8700 Dallas Avenue South and is south of the 16th Avenue South bridge.

Currently, the T-117 Upland Study Area is fenced, secured, and vacant. Three building structures remain, to include a warehouse on the south end of the site; a small garage-type building in the center of the property; and a small two-story office/warehouse building on the north end.

5.2 Site History

The T-117 area addressed for this project was specifically selected to reduce polychlorinated biphenyl (PCB) contamination in sediment. Much of the PCB contamination at the site is associated with historical industrial activities that involved asphalt manufacturing in the T-117 Upland Study Area. Asphalt manufacturing operations included the use of recycled oils, some of which contained PCBs that were released to the surrounding environment. Asphalt manufacturing activities ceased in the early 1990s; and the former asphalt plant, tanks, and some contaminated soil were removed in 1996 and 1997.

The Port acquired the former asphalt plant property in 2000. Between 1999 and 2006, the Port conducted several removal actions that focused on the removal of asphalt plant residues and PCB-contaminated soil that remained within the T-117 Upland Study Area. In 1999, a soil removal action was conducted within the T-117 Upland Study Area to remove PCB-contaminated soil from the eastern portion of the T-117 Upland Study Area. In 2003, several old drums and other large debris were removed from the offshore intertidal area. In 2004, former asphalt plant underground pipes, contaminated soil, and debris were removed. In 2006, an additional removal action was conducted to remove newly discovered PCB-impacted soil that had the highest concentrations of PCBs within the T-117 Upland Study Area.



6.0 SITE PERSONNEL

6.1 Site Organization Structure

| Team Member | Function |
|----------------------|---|
| Grant Hainsworth | Project Manager (CRETE) |
| Geoff Saunders | Site Safety Officer and Field Manager (CRETE) |
| Jamie Stevens | Quality Assurance Officer (CRETE) |
| Elisabeth Black, CIH | Project Industrial Hygienist (EMB Consulting) |

6.2 Lines of Authority and Communication

Duties of the Project Manager related to health and safety include:

- Assuring that all personnel to whom this HASP applies have received a copy of it
- Providing adequate authority and resources to the on-site SSO to allow for the successful implementation of all necessary safety procedures;
- Supporting the decisions made by the SSO;
- Maintaining regular communications with the SSO;
- Coordinating the activities of all subcontractors and ensuring that they are aware of the pertinent health and safety requirements for this project;

Duties of the SSO and Field Manager related to health and safety Include:

- Verifying that project personnel adhere to the site safety requirements outlined in this plan.
- Conducting the health and safety briefings for project personnel as appropriate.
- Monitor compliance with the approved plan.
- Ensuring that proper health and safety equipment is available for the project.
- Modifying health and safety equipment or procedure requirements and amend the approved HASP based on data gathered during the site work.
- Interface with the Project Manager as required in matters of health and safety.
- Authority to stop any operation that threatens the health or safety of the work team, surrounding populace, or the environment.



- The daily health and safety activities may be conducted by the SSO or a designated replacement.

Duties of the Certified Industrial Hygienist include:

- Develop and coordinate Site-Specific Health and Safety Plan;
- Determine appropriate monitoring, if necessary, so that employees are not exposed to levels which exceed established PELs for hazardous substances or action levels per this plan;
- Communicate requirements to Corporate Safety Director;
- Respond to field requests for assistance in safety and health from CRETE employees and the SSO; and
- Provide assistance to CRETE in conducting training of site workers, hazard communication, and other assistance, as required.

Duties of the Site Workers include:

- Read and follow the Site-Specific Health and Safety Plan;
- Check all personal safety equipment to ensure it is in good working condition prior to entering the exclusion zone;
- Immediately report any accidents/illness, spills, unsafe conditions, any unusual smells or chemical smell to the SSO;
- Incidents must be reported on a daily basis in detail for spills or accidents; and
- Immediately report any symptoms of exposure.

7.0 SITE CONTROL

Site control procedures will be established to minimize the spread of potential contaminants to protect employees and the general public.

7.1 Work Zones

Site control will be maintained by establishing clearly identified work zones. These will include exclusion zones, contamination reduction zones, support zones, and other work areas on site where the potential for airborne or contact exposure to hazardous substances is minimal.



7.1.1 Exclusion Zone

Exclusion zones will be established around each work activity (excavation or disturbance of soil, sediment, or groundwater) conducted in contaminated areas of the site. Only persons with appropriate training (40- or 24-hour Hazardous Waste Operations Training as described below in Section 8.0) and authorization from the SSO may enter exclusion zones. Traffic cones, barrier tape, and warning signs will be used, as necessary, to establish the zone boundaries.

Exclusion zones for subsurface work, including drilling, excavation, trenching, etc. will consist, at a minimum, of the entire excavation plus a 6-foot or greater buffer surrounding the excavation, as site configuration allows. This buffer may be expanded at the discretion of the SSO depending on site conditions, including weather and the results of air monitoring. Note: The buffer zone surrounding the excavation will be larger than six feet where the heavy equipment is located, as the track hoe will be located within the exclusion zone.

Exclusion zones on barges or other water vessels may encompass the entire deck working surface.

7.1.2 Contamination Reduction Zone

A contamination reduction zone will be established just outside each exclusion zone to decontaminate equipment and personnel. For barges and vessels, a contamination reduction zone may be set up at a dock, so that personnel and equipment can be decontaminated as it comes off the vessel.

This zone will be clearly delineated from the exclusion zone and support zone. The contamination reduction zone shall have boot, glove, and rain gear wash and rinse buckets, brushes, and a source of additional water (hose or water buckets) for cleaning. Used wash water will be drummed and disposed of off-site. Care will be taken to prevent contact with used wash water. Damaged or disposable Personal Protective Equipment will be placed in plastic garbage bags for disposal as solid waste.

The exteriors of heavy equipment will be cleaned using sprayed water and brushes prior to leaving the exclusion zone to remove any loose dirt. A wheel wash will be installed in the contamination reduction zone to remove dirt from wheel treads.

7.1.3 Support Zone

A support zone will be established outside the contamination reduction zone to stage clean equipment, don personal protective equipment, take rest breaks, rehydrate, etc. This zone will be clearly delineated from the contamination reduction zone.

In summary, exclusion zones will be established for excavations and site work in areas of identified contamination. Given the site history, it is conceivable, if not likely, that contaminated soil (not previously identified) will be encountered. Should excavation or site work uncover soil, sediments, or water with visible contamination or noticeable odor, the SSO will be notified, PPE will be upgraded as appropriate, and the work area will be monitored as discussed in Section 11. It should be noted that metals contamination may not provide visible or other sensory clues. Because of this, general work procedures, such as minimizing dust generation and good personal hygiene, will be practiced.



7.1.4 Minimization of Contamination

To ensure effective work zone procedures, the amount of equipment and number of personnel permitted to enter contaminated areas must be minimized. Do not kneel on contaminated ground, stir up unnecessary dust, or perform any practice that increases the probability of hand-to-mouth transfer of contaminated materials. Use plastic drop cloths and equipment covers, where possible.

8.0 TRAINING, PERSONAL PROTECTIVE EQUIPMENT, ENGINEERING CONTROLS, AND WORK PRACTICES

8.1 Training

Following is a brief description of the training required of CRETE employees, subcontractors, and visitors on site.

- All workers on site undertaking tasks in exclusion zones will have completed the 40- or 24-hour Hazardous Waste Operations Class. The training must have been completed within the past 12 months, or an 8-hour refresher must have been completed within the past 12 months.
- All workers entering the exclusion zones must also have attended a Site-Specific Health and Safety Orientation and read and signed this Site-Specific Health and Safety Plan.
- Individuals working on the site occasionally, but who do not enter the exclusion zone, must have attended a Site-Specific Health and Safety Orientation and read and signed the Site-Specific Health and Safety Plan. This will include inspectors, trades, and subcontractors.

8.2 Personal Protective Equipment

The proposed work areas for this project are well characterized with regard to chemical contaminants in soil, sediment, and groundwater. In addition, based on the levels of contaminants identified in environmental media on the site and the types of activities proposed, the potential for airborne chemicals of concern above occupational exposure limits is low. Air monitoring will be conducted during tasks with potential for release of site contaminants to air, as detailed in Section 11. If there is any indication that workers may be exposed to airborne contaminants in unacceptable concentrations, work will stop and this plan will be revised to address that hazard.

The following levels of personal protective equipment are prescribed, in compliance with WAC 296-843.

Workers conducting work in areas of identified contamination, and therefore required to enter exclusion zones, will be required to wear modified Level D personal protective equipment (PPE), which consists of the following.

- Personal Floatation Device (PFD) for work over water;



- Chemical-resistant clothing or rubber rain gear;
- Hard hat (if necessary, as determined by the SSO);
- Safety glasses with side shields;
- High visibility (Hi-vis) clothing;
- Work boots;
- Viton gloves (if necessary, as determined by the SSO);
- Hearing protection (if necessary, as determined by the SSO)

Until exposure assessment air sampling for PCBs and metals is complete for each area as outlined in Section 11, PPE required for work within the exclusion zone will be upgraded to Level C. Also, if the concentration of airborne PCBs, vapors, or metals (as determined by air monitoring) exceed specified action levels at any time, the requirements for work inside the exclusion zone may (at the discretion of the SSO), be upgraded to Level C PPE. Level C consists of all of the equipment specified for modified Level D above plus:

- Half-face air-purifying respirator with combined organic vapor/particulate cartridge.

All employees working in the contamination reduction zone, support zones, and areas of the site without documented contamination will be required to wear the following modified Level D PPE. Modified Level D consists of the following:

- Personal Floatation Device (PFD) for work over water;
- Standard construction clothing;
- Hard hat (if necessary, as determined by the SSO);
- Safety glasses with side shields;
- High visibility (Hi-vis) clothing;
- Work boots;
- Hearing protection (if necessary, as determined by the SSO)

Notes:

PFDs will be appropriately secured at all times. No personnel will be allowed over water with a PFD that is unbuckled, unzipped, etc.

If foam earplugs are used, they should only be applied with clean hands (e.g. while gloves are removed) to avoid exposing the worker to site contaminants, or earmuffs should be used.

8.3 Engineering Controls

To minimize potential exposure to contaminants present in soil, sediment, and groundwater on site, every effort will be made to minimize dust levels or migration of contaminants off site. In accordance with Puget Sound Clean Air Agency (PSCAA) Regulation 1, Section 9.15, no visible dust will be permitted during site activities.



The following procedures will be implemented during soil test pitting, drilling, stockpiling, and transport of contaminated soils or sediment to control fugitive dust emissions.

- Dust control measures are to be used for the duration of the project.
- Water or wetting agents shall be used to control dust at the excavation sites, as needed.
- Each stockpile shall be covered to minimize the potential for dust generation from the material placed in the piles and from water intrusion.

The following additional engineering controls will be practiced on site to minimize the migration of contaminants off site.

- Exclusion zones shall be clearly marked with cones or barrier tape to avoid accidental entry.
- Contamination reduction zones will be marked and equipped with buckets and brushes for decontamination. Disposable contaminated clothing will be disposed of as solid waste and re-usable clothing (i.e. hard hats, rubber rain gear and etc.) will be washed and reused.
- Decontamination areas (contamination reduction zones) shall be established at all entrances and exits to/from exclusion zones.
- All barricades and tapes shall be maintained daily prior to commencement of operations.

8.4 Work Practices

- Eating, drinking, smoking, chewing gum or tobacco, or applying of cosmetics is only permitted in support zones.
- No facial hair that would interfere with respirator fit will be permitted on employees who are required to wear respirators.
- Employees are to report to the SSO any symptoms of exposure they might experience and all accidents/incidents.
- Inspect all vehicles prior to leaving the site. Perform a wheel wash, as described in Section 12 if vehicles came into contact with site soils.
- Workers shall use proper decontamination procedures in the contaminant reduction zone.
- At the end of every workday on site, a heavy-duty plastic sheet shall be placed over the top of any stockpiled soils to minimize erosion and fugitive dust.
- All excavation and earthwork will take place using motorized excavation equipment such as track hoes, etc. Operators shall remain in their closed cabs with the ventilation on recirculate.



9.0 CHEMICAL HAZARD EVALUATION

9.1 Site Contaminants

Based on available data for the site, activities may expose workers to PCBs, petroleum hydrocarbons, arsenic, lead, and polycyclic aromatic hydrocarbons (PAHs). Hazardous building material surveys have the potential for exposure to asbestos, lead, and PCBs.

The primary routes of exposure for these contaminants are the inhalation of organic vapors, inhalation of contaminated soil or sediment particulate, inhalation of fibers, direct skin contact with contaminated media, or the accidental ingestion of contaminated soil or sediment.

The hazards are minimized by limiting dust generating activities, the use of mechanized equipment during the excavation, covering the excavation with visqueen and clean fill when not being worked on, the use of wet methods, and personal protective equipment. The hazards discussed in this section represent those known to exist on site. Given the nature of the work on this project, it is of course possible to encounter hazardous materials that had not been previously identified, particularly during sampling activities. It is difficult to predict where unknown contaminants might be present; therefore workers involved in excavation and sampling activities must be alert to potentially contaminated media. Sensory cues such as discoloration or unusual odor provide some indication of the presence of contamination. (Note: metals-contaminated soil will likely not present any of these sensory cues.) If contamination is encountered, all work in the area must cease immediately. The employee detecting the potential contaminant must notify the SSO immediately. The SSO will notify the Project Manager. Arrangements will be made to test suspect environmental media. If contamination is confirmed, the CIH will be notified and this plan will be amended accordingly.

All work with contaminated media, whether previously identified or discovered during the course of work on the site, will be performed in accordance with the requirements of this Site-Specific Health and Safety Plan. Thus, once contamination is confirmed, CRETE will be responsible for ensuring that subcontractors, and their own workers where appropriate, establish exclusion, contamination reduction, and support zones around the area to be disturbed, properly trained and certified workers will be required for the excavation, transport, and stockpiling of the contaminated media, air monitoring will be performed, etc.

9.2 Potential Exposure Routes

9.2.1 Inhalation

It is assumed that some of the compounds identified in the site assessment will be released during site work in the form of dust or vapors; however, the use of mechanized equipment will minimize worker exposure. Other workers in the vicinity of the site work should stage themselves at a safe distance upwind during excavation, if possible. Keeping the soil damp during soil disturbing activities will minimize workers' airborne exposure to contaminated dusts.



Air monitoring will be conducted to ensure workers' airborne exposures are less than the Permissible Exposure Limits (refer to Table 1 in Section 9.3--Chemical Hazard Information).

9.2.2 Skin and Eye Contact

Skin and eye contact with contaminated media presents a potential for worker exposure. For this reason, sturdy construction clothing (coveralls or rubber rain gear), boots, and safety glasses shall be worn at all times by workers on-site to prevent potential exposure. Workers entering the exclusion zone will be required to use chemical-resistant clothing, gloves, and follow decontamination procedures to further minimize the potential for skin contact with contaminated soil.

9.2.3 Ingestion

The inadvertent transfer of site contaminants from hands or other objects to the mouth could occur if site workers engage in eating, drinking, smoking, chewing gum or tobacco, or applying cosmetics in contaminated areas. This could result in accidental ingestion of site contaminants, potentially leading to illness. For this reason, eating, drinking, smoking, chewing gum or tobacco, applying cosmetics or similar activities are not allowed in the work area and especially the support, contamination reduction, and exclusion zones.

9.3 Chemical Hazard Information

Table 1 lists the contaminants of concern known to be present in current work zones on site and Washington State Division of Occupational Safety and Health (DOSH) Permissible Exposure Limits (PELs) for site contaminants in air. The primary contaminants identified on the site are PCBs, petroleum hydrocarbons, arsenic, lead, and PAHs.



| Table 1. Site Contaminants and PELs | | |
|--|--|---------------------------|
| Contaminant | DOSH PEL-TWA | DOSH STEL |
| PCBs | 0.5 mg/m ³ | 1.5 mg/m ³ |
| Petroleum Hydrocarbons | | |
| Fuel Oils | No PEL | No STEL |
| Gasoline | 300 ppm | 500 ppm |
| Diesel Fuel | No PEL | No STEL |
| Benzene | 1.0 ppm | 5.0 ppm |
| Toluene | 100 ppm | 150 ppm |
| Ethylbenzene | 100 ppm | 125 ppm |
| Xylenes | 100 ppm | 150 ppm |
| Metals | | |
| Arsenic, inorganic | 0.2 mg/m ³ | 0.6 mg/m ³ |
| Arsenic | 0.05 mg/m ³ | No STEL |
| cPAH (Adjusted TEF Sum) | 0.2 mg/m ³ (as Coal Tar Pitch Volatiles) | 0.6 mg/m ³ |
| Asbestos | 0.1 fibers/cc | 1.0 fibers/cc (30 minute) |

DOSH = Washington State Division of Occupational Safety and Health

TEF = Toxic Equivalency Factor

PEL-TWA = Permissible Exposure Limit as an 8-hour time-weighted average

STEL = Short-Term exposure Limit as a 15-minute period in an 8-hour work shift

mg/m³ = milligrams per cubic meter of air

ppm = parts per million

cc = cubic centimeter of air

Project action levels are provided in Section 11 of this Plan for on-site air monitoring. Exceeding these action levels will require reassessment and evaluation by the SSO, the CIH, and the CRETE Project Manager. These parties may require the additional use of engineering controls, upgrading PPE, or other measures to reduce potential exposures on the site.



9.4 Hazard Assessment

This section discusses the hazards associated with the contaminants remaining on site. Employees may inhale contaminated dusts or come into direct contact with contaminated media while performing excavations or otherwise handling the soil, sediment, or groundwater (stockpiling, characterizing, or transporting soils) on this project.

9.4.1 Polychlorinated Biphenyls

Polychlorinated biphenyls (PCBs) are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor.

PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. PCB exposures in the general population are not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs.

Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach, and thyroid gland injuries. Other effects of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

9.4.2 Total Petroleum Hydrocarbons

Total Petroleum Hydrocarbons (TPH) is a generic term based on analytical test procedures for the range of hydrocarbon materials from gasoline through heavier fuel oils. These materials typically consist of n-paraffins, isoparaffins, naphthenes, and aromatics in the boiling point range from approximately 50 to 250°C. Based on materials such as gasoline and fuel oils, TPH can be expected to typically act as a central nervous system depressant, resulting in slurred speech and mental confusion. Higher doses can result in unconsciousness and possibly death from respiratory failure. Skin contact can result in irritation, dermatitis, and defatting. Liver and kidney damage can also result following acute or chronic exposure.

Diesel fuel (Diesel fuel number 2) consists primarily of straight-chain hydrocarbons from C-10 to C-23. The most abundant constituents are typically



C-16 and C-17 hydrocarbons. Some aromatics may also be present, typically contributing less than 0.1 percent of the total product. Exposure to diesel fuel liquid product may produce skin irritation, and inhalation of the product mist may result in headache, nausea, and confusion.

9.4.3 Benzene

Benzene exposure can occur by inhalation, percutaneous absorption, ingestion, and skin and eye contact. Like other aliphatic and aromatic hydrocarbons, acute overexposure to benzene can cause central nervous system depression. Headache, dizziness, nausea, convulsions, coma, and death can result from elevated exposures. In some cases, acute exposure has resulted in death due to ventricular fibrillation. The principal chronic hazard associated with benzene exposures is its ability to cause changes in blood cells, including anemia and cell abnormalities. Benzene has been demonstrated to cause leukemia in epidemiological studies, and it is recognized as a human carcinogen by the National Institute for Occupational Safety and Health (NIOSH) and other agencies. The Environmental Protection Agency (EPA) currently classifies benzene as a Class A, or confirmed, human carcinogen.

9.4.4 Ethylbenzene

Ethylbenzene exposure can occur by inhalation, ingestion, and skin and eye contact. Like other aliphatic and aromatic hydrocarbons, acute overexposure to ethylbenzene can cause central nervous system depression. Headache, dizziness, nausea, convulsions, coma, and death can result from elevated exposures. Ethylbenzene also causes skin drying and defatting, and eye and mucous membrane irritation can result from overexposure.

9.4.5 Toluene

Toluene exposure can occur by inhalation, percutaneous absorption, ingestion, and skin and eye contact. Toluene can cause eye, respiratory, and skin irritation. Drying and defatting on the skin can occur with prolonged skin contact. The chief symptom of acute exposure to toluene vapor is depression of central nervous system function. Symptoms include headache, dizziness, drowsiness, uncoordination, and coma.

9.4.6 Xylene(s)

The major route of xylene toxicity is via inhalation of vapor, with percutaneous absorption and ingestion of liquid playing lesser roles. Xylene can cause irritation of the eyes, nose, and throat. Repeated skin contact may cause drying, defatting, and dermatitis. Acute exposure to vapors via inhalation may cause central nervous system depression, and liver and kidney damage.

9.4.7 Arsenic

The major route of exposure to arsenic is via inhalation of dusts or fumes or through ingestion of dust. Arsenic dust exposure causes irritation of the upper respiratory tract, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and darkening of the skin and small corns or warts. Ingestion of Arsenic laden dust from swallowing inhaled dust or ingesting contaminated soil may also cause gastrointestinal effects including nausea and vomiting. The PEL for arsenic dust is 0.2 mg/m³ with a STEL of 0.6 mg/m³.



9.4.8 Lead

The major route of exposure to lead is via inhalation of dusts or fumes or through ingestion of dust. Prolonged absorption of lead or its compounds results in severe gastrointestinal disturbances and anemia; with more serious intoxication, there is neuromuscular dysfunction, and in the most severe exposures may result in encephalopathy. The Action Level for lead dust is 0.03 mg/m^3 , the PEL is 0.05 mg/m^3 , and there is no STEL.

9.4.9 Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAH)

Epidemiological evidence suggests that workers exposed to these compounds are at increased risk of cancer at many organ sites, including lungs, kidney and skin. The major route of exposure to these compounds on this project is through inhalation of or skin contact with contaminated soils.

9.4.10 Asbestos

Asbestos mainly affects the lungs and the membrane that surrounds the lungs. Breathing high levels of asbestos fibers for a long time may result in scar-like tissue in the lungs and in the pleural membrane (lining) that surrounds the lung. This disease is called asbestosis and is usually found in workers exposed to asbestos, but not in the general public. People with asbestosis have difficulty breathing, often a cough, and in severe cases heart enlargement. Asbestosis is a serious disease and can eventually lead to disability and death.

Breathing lower levels of asbestos may result in changes called plaques in the pleural membranes. Pleural plaques can occur in workers and sometimes in people living in areas with high environmental levels of asbestos. Effects on breathing from pleural plaques alone are not usually serious, but higher exposure can lead to a thickening of the pleural membrane that may restrict breathing.

It is known that breathing asbestos can increase the risk of cancer in people. There are two types of cancer caused by exposure to asbestos: lung cancer and mesothelioma. Mesothelioma is a cancer of the thin lining surrounding the lung (pleural membrane) or abdominal cavity (the peritoneum). Cancer from asbestos does not develop immediately, but shows up after a number of years. Studies of workers also suggest that breathing asbestos can increase chances of getting cancer in other parts of the body (stomach, intestines, esophagus, pancreas, and kidneys), but this is less certain. Early identification and treatment of any cancer can increase an individual's quality of life and survival.

9.4.11 Other Chemical Hazards

Other hazards may be posed by chemicals brought on site by CRETE or their subcontractors. In accordance with DOSH requirements for hazard communication, Material Safety Data Sheets (MSDS) are available for all products brought on site. In order to facilitate the accessibility by site workers, all MSDS will be maintained in a separate binder and kept on site.



CRETE employees and subcontractors will bring on site only those materials required to perform work on site. The following procedures will be followed to optimize use of the MSDSs.

- All CRETE employees will be briefed on materials safety procedures, use of MSDSs for employee health information, and use of MSDSs for mishap response during safety meetings.
- Selected MSDSs will be reviewed as a normal part of the safety briefing.
- In the event of a spill or other emergency event involving a material brought on site by CRETE employees, the MSDS binder will be brought to the mishap location for use by the SSO, Project Manager, and any other response personnel.

10.0 PHYSICAL HAZARD EVALUATION

Potential physical hazards associated with this project include driving, heat and cold stress, noise, heavy equipment, work over water, slips, trips, and falls, and biohazards. Ways to minimize and/or eliminate these hazards are discussed below. The SSO will perform regular inspections of the site, materials, and equipment in accordance with WAC 296-800-110 to identify site hazards. On-site personnel shall be provided with the information and training necessary to avoid accidental injury.

10.1 Driving Motor Vehicles

Motor vehicle accidents are responsible for the largest number of occupational accidents, injuries, and fatalities. It is likely that the greatest hazard on this project will be the commute to and from the job site and work in and around motor vehicles on site.

Only licensed drivers may operate vehicles for this project. Drivers and passengers must comply with all traffic laws and posted signs. No one should operate a vehicle or any other equipment on the project if they are under the influence of impairing medication, alcohol, or any other substance.

10.2 Heat Stress

Work will be performed in accordance with WAC 296-62-095 with regard to heat stress. Site personnel may be required to perform their work tasks in ambient temperatures of 70°F or above or while wearing impervious clothing. All personnel must be instructed on the symptoms of the primary heat-related disorders and how to minimize their chances of becoming affected by them. These disorders, their symptoms, and first-aid measures are outlined below:

- Heat Rash: Decreased ability to tolerate heat, raised red vesicle on affected areas, and clothes that chafe. Maintain good personnel hygiene and use drying powders or lotions.



- Heat Cramps: Muscle spasms and pain in the extremities and abdomen. Rest in cool area and drink plenty of fluids. If pain persists, seek medical attention.
- Heat Exhaustion: Shallow breathing; pale, cool, moist, clammy skin, profuse sweating, dizziness, lassitude, and fainting. Rest in a cool area and drink plenty of fluids. Get medical attention prior to returning to work.
- Heat Stroke: Red, hot, dry skin, no perspiration, nausea, dizziness, confusion, strong rapid pulse, coma. Cool victim immediately with cool or cold water. Seek immediate medical attention.

At a minimum, personnel wearing non-breathable clothing at temperatures greater than 70°F should take a break every one to two hours and drink plenty of fluids. The intake of an average of one quart of fluids per hour is recommended. CRETE is required to provide enough water on site for each employee to drink one quart per hour on site. A cool or shaded rest area should be used.

10.3 Cold Stress

Site personnel will be instructed on the signs, symptoms, and the prevention of cold-related disorders prior to performing specific work tasks. The two major effects of cold stress are frostbite and hypothermia.

- Frostbite: Sudden blanching of the skin progressing to skin with a waxy or white appearance, which is firm to the touch, but the tissue beneath the skin is resilient to the touch.
- Hypothermia: The symptoms of systematic hypothermia are exhibited as follows: (1) shivering, (2) apathy, listlessness, and (sometimes) rapid cooling of the body to less than 90F, (3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate, (4) freezing of the extremities, and (5) death.

Personnel will monitor themselves and other team members for signs of frostbite and hypothermia. If temperatures fall below 20°F, thermal clothing may be required. Field activities will be curtailed if equivalent wind chill temperatures are less than 0°F, unless operations are of an emergency nature.

10.4 Noise

Heavy equipment or operating machinery may produce noise levels that exceed 85 decibels A scale (dBA) for personnel working in or around these areas. Thus, hearing protection must be worn by personnel when they are exposed to noise levels of 85 dBA or greater. Noise measurements, if conducted, should be performed with sound level meters in slow response mode, or with noise dosimeters having a beginning collection point established at 80 dBA. A general guideline to follow is if a conversation cannot be held with a person 4 feet from you without raising your voice, the noise levels are too high and hearing protection should be worn.



10.5 Heavy Equipment

Heavy equipment to be used on this project includes excavators and drill rigs. Equipment must be maintained in good working condition and operated in a safe manner. Heavy equipment operators must be trained in the operation and handling of the applicable piece of equipment. Equipment must have audible alarms, rollover protection, seat belts, and be equipped with a fire extinguisher. Subcontractors shall not use equipment that they judge to be unsafe due to deterioration, missing parts, or obvious defects. Visual safety inspections shall be conducted daily and documented inspections shall be conducted monthly.

10.6 Water Safety

Sampling and surveying from barges or other vessels present a potential drowning hazard. All personnel working on or near (within 6') the water must wear a properly fastened (e.g. zipped and clipped) U.S. Coast Guard approved personal flotation device (PFD). Ring buoys with 70 feet of attached polypropylene line shall be maintained aboard the floating equipment. Man overboard drills shall be conducted by the crews prior to commencing work and periodically thereafter. The "buddy system" shall be mandatory for all crew members working on, over, or near the water.

10.7 Slips, Trips, and Falls

Slips, trips, and falls are a major concern while working on any site and account for a large number of occupational accidents. Personnel must be aware of their surroundings while moving about the site. Pathways and work areas must be kept free of debris and supplies to prevent unsafe walking and working conditions. Changes in elevation such as ruts, holes, broken pavement, or berms should be marked, if possible. When water is used during any of the work tasks, care must be taken to avoid creating muddy or slippery conditions. If slippery conditions are unavoidable, barriers and warning signs must be used to warn of these dangers.

10.8 Biological Hazards

Project personnel should be provided with the information and training necessary to avoid accidental injury or illness that can result from exposure to biological hazards. This includes ensuring that the site is carefully assessed when personnel are on site so that the hazards associated with biological entities are recognized and eliminated or controlled. Potential biological hazards associated with the project site include animals, such as raccoons and rats; stinging insects, such as bees and yellow jackets; and plants, such as blackberries.

11.0 AIR MONITORING AND INSTRUMENTATION

CRETE will conduct air monitoring for this project, as needed. Subcontractors may conduct their own air monitoring, and will be required to provide their results to CRETE as soon as possible if air monitoring action levels are reached.



Air monitoring and visual observations of the site are required to determine the effectiveness of engineering controls, to reevaluate levels of protection, and determine if site conditions have changed. The monitoring will occur only during work that will disturb environmental media known to contain contaminants. This will consist of personal air samples for PCBs, volatile organic compounds, and metals, as required.

- Personal air monitoring for PCBs and metals (lead and arsenic) will be conducted if visible dust emissions are occurring during soil sampling or other site activities;
- Area sampling for VOCs with a photoionization detector (PID) will be conducted if odors are detected.
- PAHs are semi-volatile, meaning they do not present a significant airborne hazard at the levels identified.

PCB and Metals samples will be collected during disturbance of environmental media known to contain contaminants, as the SSO deems necessary. Air samples for PCBs will be collected in accordance with NIOSH Method 5503 using a florosil tube. Air samples for metals will be collected in accordance with NIOSH Method 7300 using 37-mm mixed cellulose ester fiber filter cassettes and a personal air sampling pump. For both types of samples, the sampling train will be calibrated on site prior to and after the sampling period using a primary standard.

Volatile organic concentrations will be assessed using a photoionization detector (PID), if required.

Table 2 below describes the actions that will be initiated if and when air monitoring indicates potentially hazardous exposures on site.

| Table 2: Air Monitoring Action Limits | | |
|---|---|--|
| Monitoring Device | Result | Action Required |
| Personal Air Samples for PCBs and Metals | Less than half of the PEL for all COCs | <ul style="list-style-type: none"> • Continue Periodic Monitoring |
| | More than half of the PEL for any COC, but less than the PEL for all COCs | <ul style="list-style-type: none"> • Cease operations until the SSO has evaluated the situation • Notify the project CIH who will decide whether to modify the plan and upgrade to level C, including respiratory protection |
| | At the PEL for a single COC | <ul style="list-style-type: none"> • Cease operations until the SSO has evaluated the situation • Notify the project CIH who will decide whether to modify the plan and will upgrade to level C |
| Photoionization Detector for VOCs | 0 to 10 units above background sustained for 1 minute | <ul style="list-style-type: none"> • Continue Periodic Monitoring |
| | 10 to 25 units above background sustained for 1 minute | <ul style="list-style-type: none"> • Cease operations until the SSO has evaluated the situation • Notify the project CIH who will decide whether to modify the plan and upgrade to level C, including respiratory protection |
| | > 25 units above background sustained for 1 minute | <ul style="list-style-type: none"> • Cease operations until the SSO has evaluated the situation • Notify the project CIH who will decide whether to modify the plan and will upgrade to level C |



12.0 DECONTAMINATION PROCEDURES

12.1 Personnel

A decontamination station will be set up at each activity site where contaminated media may be encountered in the contamination reduction zone. Personnel are expected to perform a gross decontamination prior to leaving the exclusion zone of any of these sites. All personnel working in the exclusion zone are expected to observe decontamination procedures.

Drink breaks are to be taken at the outside edge of the contaminant reduction zone.

The Support Zone will contain:

- Restroom facility
- Drinking water and cups
- First aid kit
- Extra gloves and chemical-resistant clothing
- Extra respirator cartridges, if required
- Towels and wipes

Gross Decontamination includes:

- Wash rubber boots and remove.
- Remove coveralls and gloves. Spray off rain gear and rubber gloves.
- Remove respirator.
- Wash hands and face prior to drinking fluids.

12.2 Vehicles and Heavy Equipment

The surfaces of all heavy equipment that come into contact with soils will be cleaned prior to removal from site with power-washer or heavy brooms. The SSO is responsible for assuring decontamination activities.

13.0 EMERGENCY RESPONSE PLAN

13.1 Pre-Emergency Planning

The SSO is responsible for emergency contingency planning and as such, is responsible for:

- Posting emergency telephone numbers and route to the hospital in the field



- Conducting a weekly inventory of site emergency equipment, spill response and supplies
- Familiarizing themselves with emergency procedures for personnel injury or suspected overexposures, fires, explosions or releases
- Identifying the names of all personnel on site who are certified in CPR and first aid
- Briefing new employees on the emergency response plan before they perform fieldwork.

13.2 Emergency Equipment and Supplies

The following emergency equipment and supplies will be available on site during days with field sampling:

- Fire extinguishers;
- Industrial first aid kit; and
- Eye wash.

13.3 Emergency Recognition and Prevention

Prevention of emergencies will be aided by the effective implementation of the health and safety procedures specified in this Site-Specific Health and Safety Plan. The following hazards which could lead to emergency situations have been identified as being potentially present during the course of field activities:

- Drowning or other water accidents when working from barges or vessels;
- Traumatic injury from heavy equipment accidents, rusty or sharp demolition debris, and/or falling into holes or trenches; and
- Exposure to harmful chemical dusts and vapors.

13.4 Emergency Medical Treatment and First Aid

- Prevent further injury, perform appropriate decontamination and notify the SSO.
- Depending upon the type and severity of the injury, the SSO will call 911 for an ambulance.
- Notify CRETE personnel.
- Prepare an incident report.



13.5 Emergency Decontamination

Personnel will be decontaminated to the extent feasible but life saving and first aid procedures take priority over decontamination efforts. Workers shall grossly decontaminate the injured person.

13.6 Evacuation Routes and Procedures

In case of emergencies, evacuation routes will be designated. Personnel will exit the site and assemble at the designated point in the support zone. The SSO will account for personnel at the on site assembly point and notify local emergency responders. The SSO will assess the need for site evacuation based on the degree of hazard posed to personnel in the support zone.

Evacuation routes will be determined on a site-by-site basis. Elements that will be considered in the selection of the route include: wind direction, obstructions, topography, and type of emergency. Assembly Points will be determined, as needed.

13.7 Critique of Response and Follow-up

The Project Manager or their designee will evaluate the effectiveness of the emergency response and recommend procedures for improving emergency response to the Project CIH. Follow-up activities include notification of the CRETE Project Manager within 24 hours of the injury, investigation of cause and implementation of measures to prevent reoccurrence.

14.0 MEDICAL MONITORING

Employees assigned to duties that require them to wear respirators will, prior to work, be assessed by a physician to determine if they are qualified to do so.

- A description of the type of respirator, duties to be performed and any other pertinent information will be provided to the physician.
- The examination will be performed in accordance with the requirements of WAC 296-843.
- A written report of findings will be made on each employee listing any restrictions.
- The medical status of the employees will be assessed at least annually or more often if circumstances indicate the need.

15.0 EMERGENCY CONTACTS

The initial contact by CRETE field personnel will be to the SSO. The Project Manager will provide subsequent notification to the parties listed below. If the SSO or Project Manager must be absent from the site, an assigned alternate will be responsible for establishing communications. CRETE will first notify the Seattle Police and Fire Departments by calling 911. In the event of a spill, notification will proceed in the following order:

1. Department of Ecology Spill Response 24 hr Emergency Line



(206) 649-7130

2. EPA Region X HQ (206) 553-1200

Emergency medical services are available at the following locations:

Harborview Medical Center

325 9th Avenue
Seattle, Washington
206.223.3000
(See Figure 1)

Sea Mar CHC–Seattle Clinic

8720 14th Avenue South
Seattle, Washington
206.762.3730
(See Figure 2)

The following records shall be kept on site during activities on site:

- This plan with a complete signature sheet as of that day
- Material Safety Data Sheets
- Medical approval to wear respirator and respirator fit tests
- Air monitoring data
- Daily sign-in and out log
- Copies of workers' 40-Hour or 8-Hour Refresher Hazardous Waste Site Training Certificates
- Attendance list for Site Safety Briefings

16.0 RECORDKEEPING

The SSO will be responsible for maintaining records that demonstrate all provisions of this Site-Specific Health and Safety Plan are implemented throughout the course of this project. During disturbance of contaminated media, air monitoring, as described in Section 11, will be conducted as required. If conducted, air monitoring logs will include the following information:

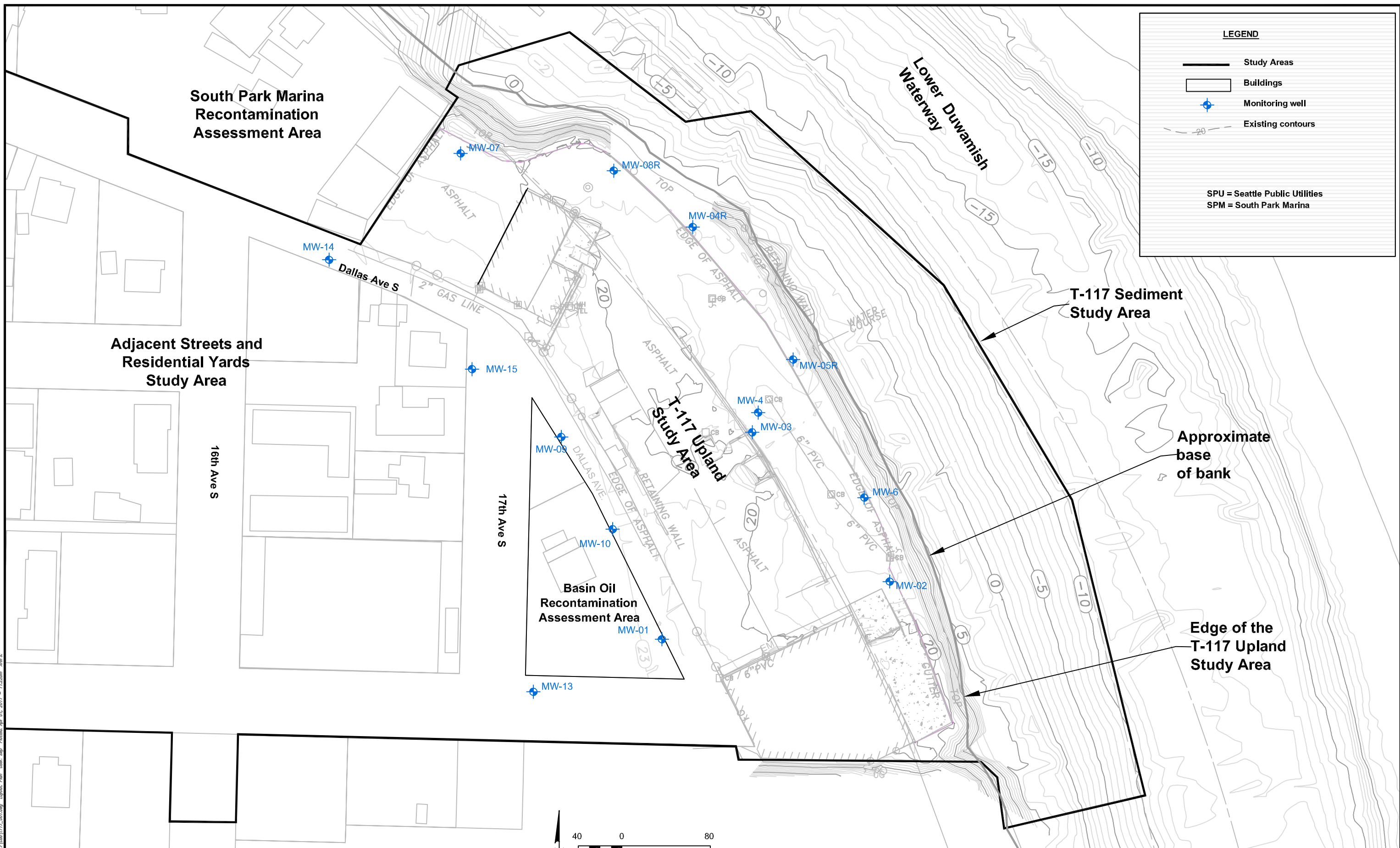
- Date
- Area Monitored
- Employees in the particular area being monitored
- Equipment being used by the employees working in the area being monitored



- The PPE being worn by these employees
- PPE used by CRETE personnel, site visitors, and designated city and private inspectors, as required
- Air monitoring equipment used
- Calibration information for each piece of equipment used for sampling
- Results of air monitoring
- A brief description of the daily activities along with associated health and safety activities
- SSO signature

In addition to the air monitoring logs, the SSO will also maintain the minutes of site safety meetings.

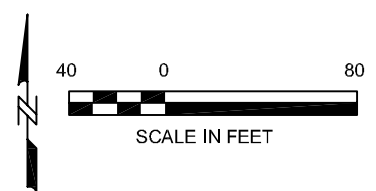
**APPENDIX A
SITE MAPS**



LEGEND

- Study Areas
- Buildings
- Monitoring well
- Existing contours

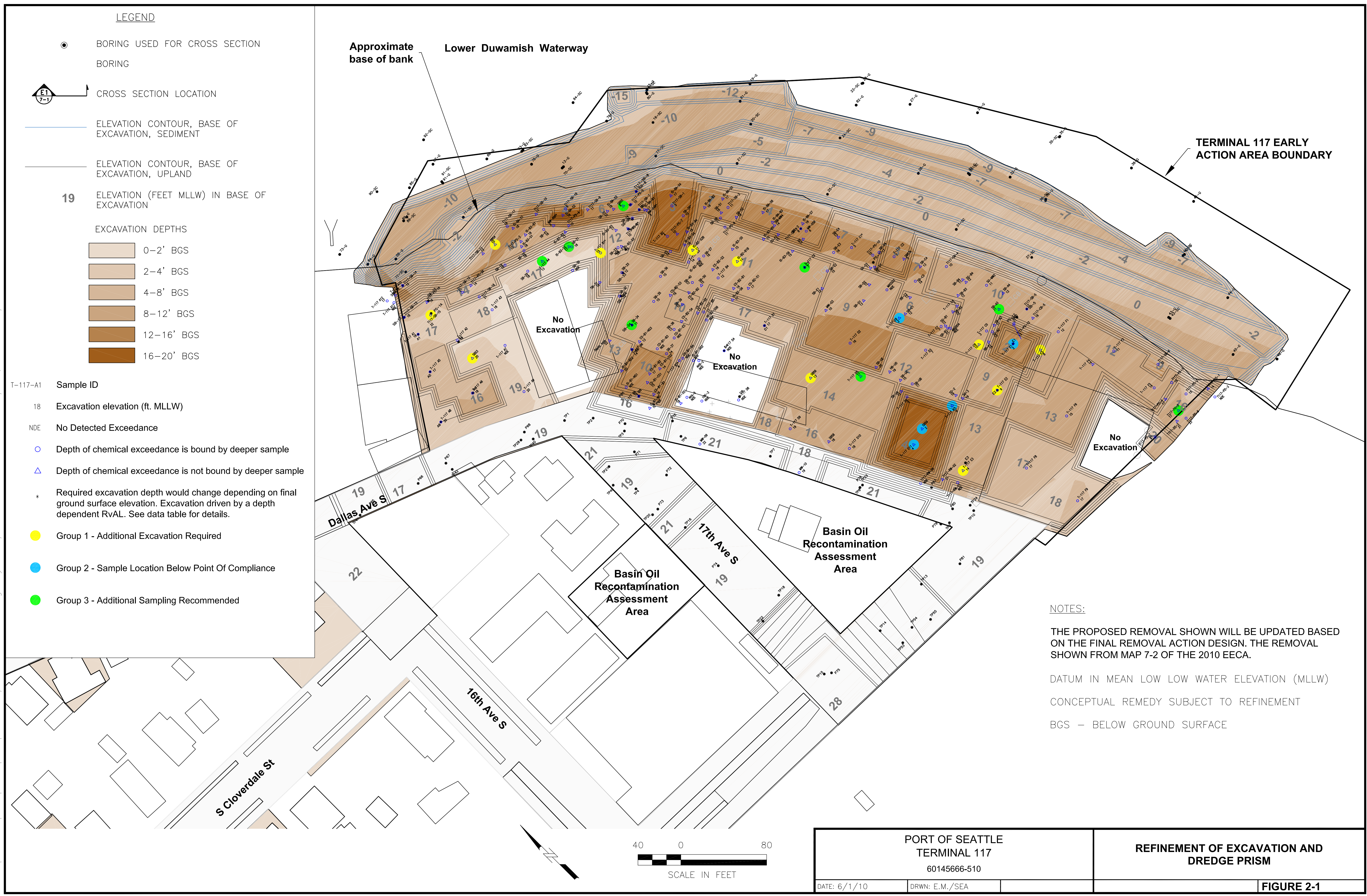
SPU = Seattle Public Utilities
SPM = South Park Marina



| | | | |
|---------------|-----------|-----------|------------|
| T-117 | | SITE PLAN | |
| DATE: 3/31/11 | DRWN: BTS | | FIGURE 1-1 |

File: G:\projects\Olefin\Olefin\117\117.dwg Layout: Plan User: smp PlotDate: Apr 01, 2011 11:28am 20x30

File: G:\PROJECTS\C400\T-117\EECA\excavation_plan_Alt2_refinement.dwg Layout: Map 7-2 User: oliveriam Plotted: Apr 21, 2011 - 2:26pm Xref's:



LEGEND

- BORING USED FOR CROSS SECTION
 - BORING
 - ⊠ CROSS SECTION LOCATION
 - ELEVATION CONTOUR, BASE OF EXCAVATION, SEDIMENT
 - ELEVATION CONTOUR, BASE OF EXCAVATION, UPLAND
 - 19 ELEVATION (FEET MLLW) IN BASE OF EXCAVATION
- EXCAVATION DEPTHS**
- 0-2' BGS
 - 2-4' BGS
 - 4-8' BGS
 - 8-12' BGS
 - 12-16' BGS
 - 16-20' BGS
- T-117-A1 Sample ID
- 18 Excavation elevation (ft. MLLW)
 - NDE No Detected Exceedance
 - Depth of chemical exceedance is bound by deeper sample
 - △ Depth of chemical exceedance is not bound by deeper sample
 - * Required excavation depth would change depending on final ground surface elevation. Excavation driven by a depth dependent RVAL. See data table for details.
 - Group 1 - Additional Excavation Required
 - Group 2 - Sample Location Below Point Of Compliance
 - Group 3 - Additional Sampling Recommended

NOTES:

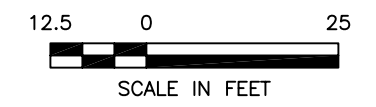
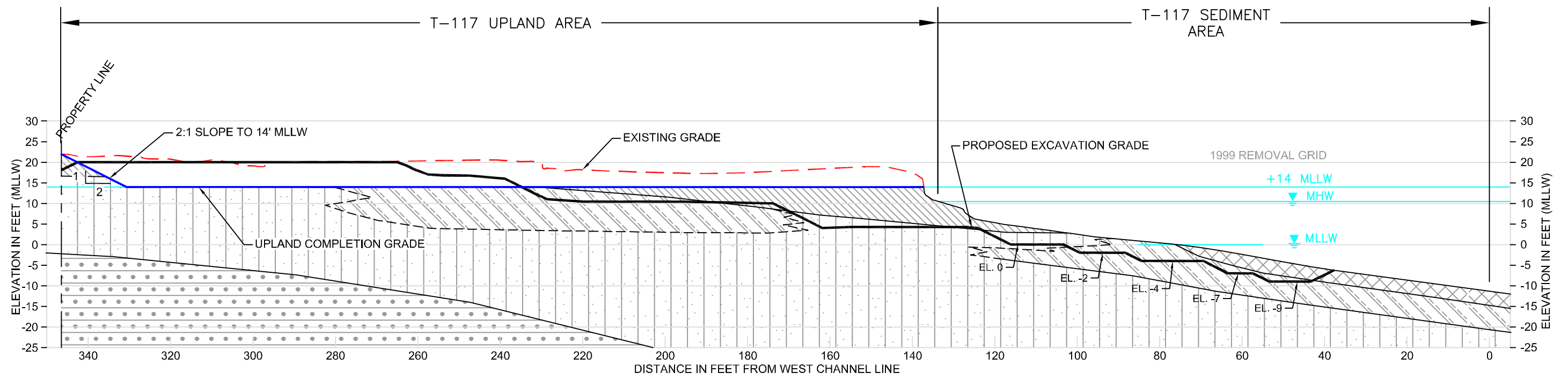
THE PROPOSED REMOVAL SHOWN WILL BE UPDATED BASED ON THE FINAL REMOVAL ACTION DESIGN. THE REMOVAL SHOWN FROM MAP 7-2 OF THE 2010 EECA.

DATUM IN MEAN LOW LOW WATER ELEVATION (MLLW)

CONCEPTUAL REMEDY SUBJECT TO REFINEMENT

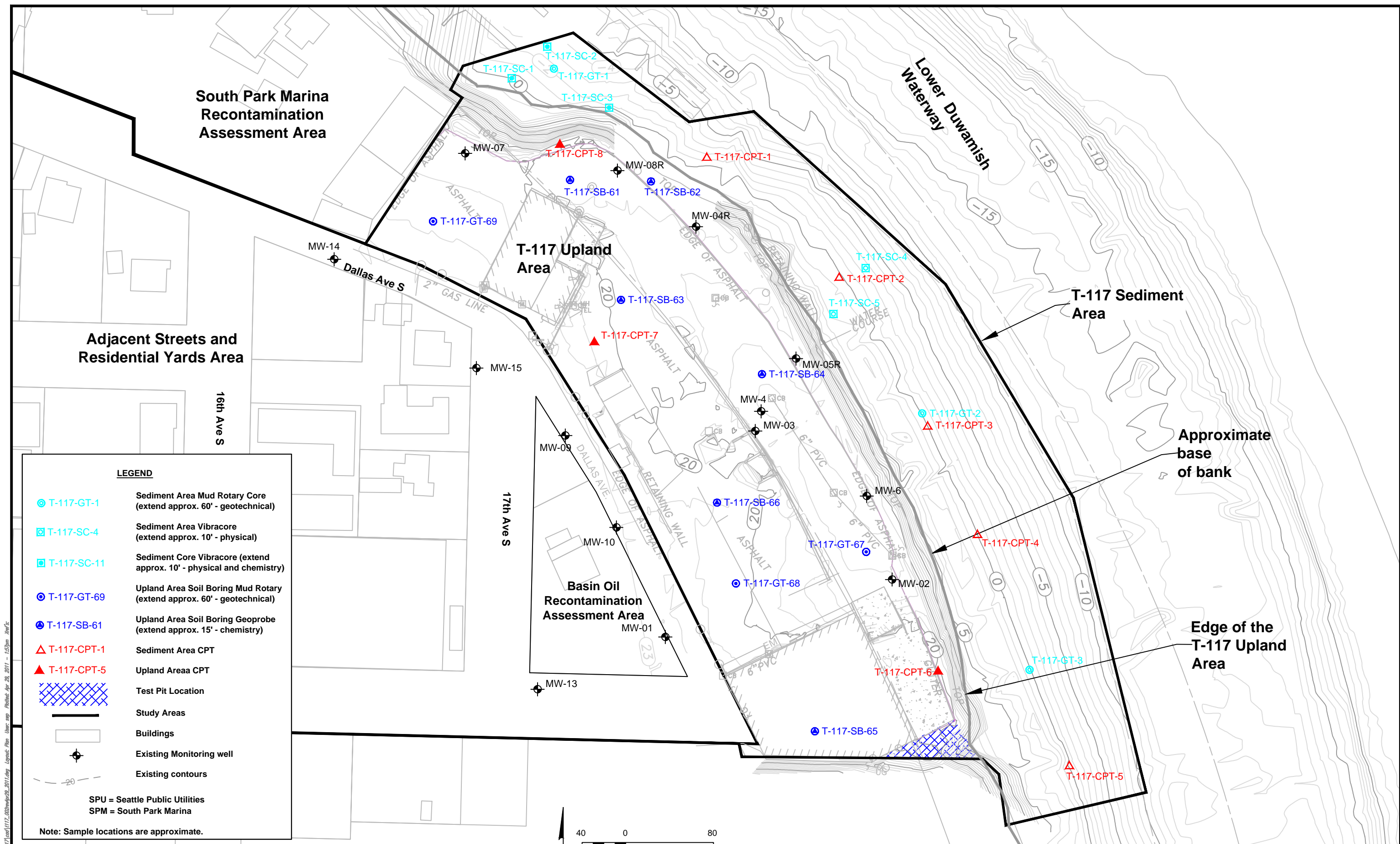
BGS - BELOW GROUND SURFACE

| | | |
|---|----------------|--|
| PORT OF SEATTLE TERMINAL 117 60145666-510 | | REFINEMENT OF EXCAVATION AND DREDGE PRISM |
| DATE: 6/1/10 | DRWN: E.M./SEA | FIGURE 2-1 |



| | | |
|--|-----------|----------------------------------|
| Field Investigation Work Plan T-117 Early Action Area | | ASSUMED UPLAND COMPLETION OPTION |
| DATE: 04/13/2011 | DRWN: BTS | FIGURE 2-2 |

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LEGEND

- ⊙ T-117-GT-1 Sediment Area Mud Rotary Core (extend approx. 60' - geotechnical)
- ⊞ T-117-SC-4 Sediment Area Vibracore (extend approx. 10' - physical)
- ⊞ T-117-SC-11 Sediment Core Vibracore (extend approx. 10' - physical and chemistry)
- ⊙ T-117-GT-69 Upland Area Soil Boring Mud Rotary (extend approx. 60' - geotechnical)
- ⊙ T-117-SB-61 Upland Area Soil Boring Geoprobe (extend approx. 15' - chemistry)
- △ T-117-CPT-1 Sediment Area CPT
- ▲ T-117-CPT-5 Upland Area CPT
- ▨ Test Pit Location
- Study Areas
- Buildings
- ⊕ Existing Monitoring well
- Existing contours

SPU = Seattle Public Utilities
SPM = South Park Marina

Note: Sample locations are approximate.



| | |
|--------------------------------------|----------------------------------|
| FIELD INVESTIGATION WORK PLAN | PROPOSED SAMPLE LOCATIONS |
| DATE: 4/21/2011 | DRWN: BTS |
| FIGURE 3-1 | |

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**APPENDIX B
JOB HAZARD ASSESSMENT**

**APPENDIX B
JOB HAZARD ANALYSIS**

A Job Hazard Analysis (JHA) for each major project activity is provided below. All JHAs were performed by Elisabeth Black, CIH of EMB Consulting.

JOB HAZARD ANALYSIS 1

ACTIVITY: MOBILIZING TO SITE AND DRIVING ON SITE

DESCRIPTION: Driving personal and company vehicles to and on site. Walking around site.

| PRINCIPAL STEPS | POTENTIAL HAZARDS | RECOMMENDED CONTROLS |
|--|--|---|
| Driving motor vehicles to and on site; walking on site | Driving distracted Vehicle accidents Striking pedestrians Vehicle breakdown Severe weather | Practice safe driving at all times Only licensed drivers allowed to operate vehicles Obey all traffic rules Avoid driving in severe weather, if possible. If not, reduce speed and turn on headlights Wear a seat belt at all times when in moving vehicle Do not use mobile phone without a headset while driving Equip vehicle with emergency supplies/spare tire Wear the following PPE: <ul style="list-style-type: none"> • Reflective clothing if walking on site • Hard hat • Steel-toed or sturdy boots |

DRIVING AND WALKING ON SITE

LEVEL OF PROTECTION: None

AIR MONITORING PLAN: No air monitoring planned for this project activity.

JOB HAZARD ANALYSIS 2

ACTIVITY: GEOTECHNICAL BORINGS

DESCRIPTION: Geotechnical borings will be placed offshore and on-land during this phase of the project. The offshore exploration includes 3 borings, 5 cores, and 5 CPTs that will be performed from a barge. Borings will be installed with a mud rotary drill rig. Cores will be installed using a vibracore. The on-land exploration program will consist of 3 mud rotary borings and 3 CPTs. CPTs are pushed using a hydraulic systems and the offshore borings will be performed with using a mud rotary system.

| PRINCIPAL STEPS | POTENTIAL HAZARDS | RECOMMENDED CONTROLS |
|------------------------------|--|---|
| Offshore sampling from barge | Work around heavy equipment Drowning Extreme Weather Slips, trips, falls Cuts and lacerations Eye injuries Exposure to hazardous chemicals | Boater safety training/Vessel-specific safety briefing Be conscious of changing weather and tide conditions Work in pairs or larger teams Wear the following PPE: <ul style="list-style-type: none"> • PFD • Slip-resistant boots • Leather or Viton gloves • Safety glasses • Hard hat • Weather-appropriate clothing • Rubber rain gear or disposable chemical protective clothing if contaminated media Follow decontamination protocols |

| | | |
|------------------|--|--|
| On-land sampling | <p>Extreme Weather</p> <p>Slips, trips, falls</p> <p>Cuts and lacerations</p> <p>Eye injuries</p> <p>Exposure to hazardous chemicals</p> <p>Biological hazards</p> | <p>Be conscious of changing weather conditions</p> <p>Work in pairs or larger teams</p> <p>Wear the following PPE:</p> <ul style="list-style-type: none"> • Reflective clothing • Construction boots • Leather or Viton gloves • Safety glasses • Hard hat • Weather-appropriate clothing • Rubber rain gear or disposable chemical protective clothing if contaminated media <p>Follow decontamination protocols</p> |
|------------------|--|--|

GEOTECHNICAL BORING

LEVEL OF PROTECTION:

PRIMARY: 'A' 'B' 'C' 'D' (Level D, modified if warranted)

AIR MONITORING PLAN: No air monitoring planned for this project activity, unless SSO determines it is required.

HAZARD ANALYSIS 3

ACTIVITY: INVESTIGATION OF SHORELINE SEEPS

DESCRIPTION: The bank survey will be conducted at low tide. While doing the bank survey, the locations of seeps will be noted on the site plan elevation estimated. The soils that the seeps occur in will be identified, and the flow out of the seep will be estimated. The debris will be photographed and noted on the site plan.

| PRINCIPAL STEPS | POTENTIAL HAZARDS | RECOMMENDED CONTROLS |
|--|--|--|
| Walking and working on beach at low tide | Slips, trips, falls Biological hazards Extreme Weather | Work in pairs or larger teams Wear appropriate PPE: <ul style="list-style-type: none"> • Reflective vest • Slip-resistant boots • Safety glasses • Hard hat • Weather-appropriate clothing Be conscious of changing weather and tide conditions |

INVESTIGATION OF SHORELINE SEEPS

LEVEL OF PROTECTION:

PRIMARY: [] 'A' [] 'B' [] 'C' [X] 'D'

AIR MONITORING PLAN: No air monitoring planned for this project activity.

JOB HAZARD ANALYSIS 4

ACTIVITY: **COLLECTION OF EXCAVATION PRISM DATA**

DESCRIPTION: Six Geoprobe borings to approximately 18 feet bgs for analytical testing of soil. Test Pits in the southern vegetated swale area to approximately 4 feet bgs. 3 Sediment Area vibracore locations to approximately 10 feet below mudline for chemical and physical analysis of along the north bank to assess potential excavation at low tide versus a sheetpile wall.

| PRINCIPAL STEPS | POTENTIAL HAZARDS | RECOMMENDED CONTROLS |
|---|--|--|
| Geoprobe, test pits, vibracore, and soil sampling | Work around heavy equipment Drowning Extreme Weather Slips, trips, falls Cuts and lacerations Eye injuries Exposure to hazardous chemicals | Be conscious of changing weather conditions Work in pairs or larger teams Wear the following PPE: <ul style="list-style-type: none"> • PFD • Reflective clothing • Construction boots • Leather or Viton gloves • Safety glasses • Hard hat • Weather-appropriate clothing • Rubber rain gear or disposable chemical protective clothing if contaminated media Follow decontamination protocol |

COLLECTION OF EXCAVATION PRISM DATA

LEVEL OF PROTECTION:

PRIMARY: [] 'A' [] 'B' [] 'C' [X] 'D' (Level D, modified if warranted)

AIR MONITORING PLAN: No air monitoring planned for this project activity, unless SSO determines it is required.

JOB HAZARD ANALYSIS 5

ACTIVITY: HAZARDOUS BUILDING MATERIALS ASSESSMENT

DESCRIPTION: A hazardous building materials assessment will be conducted for three existing structures and other site features on the property. The sampling will include specific testing for asbestos, lead, PCBs, and Universal Wastes in building materials.

| PRINCIPAL STEPS | POTENTIAL HAZARDS | RECOMMENDED CONTROLS |
|---|--|---|
| Collection of building material samples | Slips, trips, falls Cuts and lacerations Eye injuries Exposure to hazardous chemicals Biological hazards | Work in pairs or larger teams Wear the following PPE: <ul style="list-style-type: none"> • Half-face air purifying respirator when collecting samples of friable materials • Steel-toed boots or shoes • Leather or nitrile gloves • Safety glasses • Hard hat • Weather-appropriate clothing Wash hands following sampling activities |
| Use of an aerial lift and ladders to collect roof samples and samples at height | Falls Electrocutation | Implement a Fall Protection Plan Receive training on proper use of aerial lift and ladders Use proper fall restraint equipment, as specified in the Fall Protection Plan Assess the location of overhead electrical wiring before employing the lift or ladder |

HAZARDOUS MATERIALS ASSESSMENT

LEVEL OF PROTECTION:

PRIMARY: [] 'A' [] 'B' [x] 'C' [x] 'D'

A half-face respirator will be used if sampling friable suspect asbestos-containing material, or if biological hazards are identified, such as bird droppings or mold.

AIR MONITORING PLAN: No air monitoring planned for this project activity.

JOB HAZARD ANALYSIS 6

ACTIVITY: SUBSURFACE MAPPING

DESCRIPTION: The proposed in-water work includes bathymetric (multibeam) and side scan sonar surveys.

| PRINCIPAL STEPS | POTENTIAL HAZARDS | RECOMMENDED CONTROLS |
|--------------------|---|--|
| Mapping over water | Work around heavy equipment Drowning Extreme Weather Slips, trips, falls | Boater safety training/Vessel-specific safety briefing Be conscious of changing weather and tide conditions Work in pairs or larger teams Wear the following PPE: <ul style="list-style-type: none"> • PFD • Slip-resistant boots • Safety glasses • Hard hat • Weather-appropriate clothing |
| Mapping on land | Extreme Weather Slips, trips, falls Biological hazards | Be conscious of changing weather conditions Wear the following PPE: <ul style="list-style-type: none"> • Reflective clothing • Construction boots • Safety glasses • Hard hat • Weather-appropriate clothing |

SUBSURFACE MAPPING

LEVEL OF PROTECTION:

PRIMARY: 'A' 'B' 'C' 'D'

AIR MONITORING PLAN: No air monitoring planned for this project activity.

JOB HAZARD ANALYSIS 7

ACTIVITY: **INSTALLATION OF A METEOROLOGICAL STATION**

DESCRIPTION: A meteorological station will be installed prior to the removal action to record local information that will be used in the implementation of the removal action. A ten-meter aluminum tower and instrumentation will be assembled and installed along adjacent to T-117 Upland Area.

| PRINCIPAL STEPS | POTENTIAL HAZARDS | RECOMMENDED CONTROLS |
|--------------------------------------|---|--|
| Installation of meteorologic station | Work around heavy equipment Work with power tools Slips, trips, falls Cuts and lacerations Eye injuries | Wear the following PPE <ul style="list-style-type: none"> • Reflective clothing • Construction boots • Leather gloves • Safety glasses • Hard hat • Weather-appropriate clothing |

INSTALLATION OF A METEOROLOGICAL STATION

LEVEL OF PROTECTION:

PRIMARY: [] 'A' [] 'B' [] 'C' [X] 'D'

AIR MONITORING PLAN: No air monitoring planned for this project activity.

JOB HAZARD ANALYSIS 8

ACTIVITY: CLEARING VEGETATION FOR SITE SURVEY

DESCRIPTION: Vegetation on bank will need to be trimmed to get an accurate survey.

| PRINCIPAL STEPS | POTENTIAL HAZARDS | RECOMMENDED CONTROLS |
|---------------------|--|---|
| Clearing vegetation | Work around heavy equipment Slips, trips, falls Cuts and lacerations Eye injuries Biological hazards | Work in pairs or larger teams Wear the following PPE <ul style="list-style-type: none"> • Reflective clothing • Construction boots • Leather gloves • Safety glasses • Hard hat • Weather-appropriate clothing |

CLEARING VEGETATION FOR SITE SURVEY

LEVEL OF PROTECTION:

PRIMARY: 'A' 'B' 'C' 'D'

AIR MONITORING PLAN: No air monitoring planned for this project activity.

JOB HAZARD ANALYSIS 9

ACTIVITY: HABITAT SURVEY AND WETLAND DELINEATION

DESCRIPTION: Field assessment

| PRINCIPAL STEPS | POTENTIAL HAZARDS | RECOMMENDED CONTROLS |
|--|--|---|
| Habitat survey and wetland delineation | Slips, trips, falls Biological hazards Extreme Weather | Work in pairs or larger teams Wear appropriate PPE: <ul style="list-style-type: none">• Reflective vest• Slip-resistant boots• Safety glasses• Hard hat• Weather-appropriate clothing Be conscious of changing weather and tide conditions |

HABITAT SURVEY AND WETLAND DELINEATION

LEVEL OF PROTECTION:

PRIMARY: [] 'A' [] 'B' [] 'C' [X] 'D'

AIR MONITORING PLAN: No air monitoring planned for this project activity.

JOB HAZARD ANALYSIS 10

ACTIVITY: **ARCHAEOLOGICAL MONITORING**

DESCRIPTION: Archaeological monitoring associated with the investigation work will include the following tasks:

- Observation of test pit excavations
- Review of collected soil cores, particularly those from undisturbed native soil and from near the former oxbow or meander at the north end of the site

| PRINCIPAL STEPS | POTENTIAL HAZARDS | RECOMMENDED CONTROLS |
|--|--|---|
| Observe test pit placement and review soil cores | Work around heavy equipment Extreme Weather Slips, trips, falls Cuts and lacerations Eye injuries Exposure to hazardous chemicals | Be conscious of changing weather conditions Work in pairs or larger teams Wear the following PPE: <ul style="list-style-type: none"> • Reflective clothing • Construction boots • Leather or Viton gloves • Safety glasses • Hard hat • Weather-appropriate clothing • Rubber rain gear or disposable chemical protective clothing if contaminated media |

ARCHAEOLOGICAL MONITORING

LEVEL OF PROTECTION:

PRIMARY: [] 'A' [] 'B' [] 'C' [X] 'D' modified Level D, if warranted.

AIR MONITORING PLAN: No air monitoring planned for this project activity.

APPENDIX C
MEDICAL AND TRAINING CERTIFICATES

APPENDIX D
SITE-SPECIFIC HEALTH AND SAFETY PLAN
REVIEW SIGNATURE SHEET

SITE-SPECIFIC HEALTH AND SAFETY PLAN
PRE-DESIGN DATA NEEDS WORK PLAN ACTIVITIES
PORT OF SEATTLE, TERMINAL 117
EARLY ACTION AREA
LOWER DUWAMISH WAY SUPERFUND SITE
8700 DALLAS AVENUE SOUTH
SEATTLE, WASHINGTON

REVIEW SIGNATURE SHEET

Health and Safety Plan Certification: This Site-Specific Health and Safety Plan is written in compliance with industry standards and the requirements of WAC 296-843 for application at the Port of Seattle, Terminal 117 worksite in Seattle, Washington for the tasks specified in this plan.



June 26, 2011

Elisabeth Black, CIH
EMB Consulting LLC

Date

We, the undersigned, have reviewed this plan, are familiar with its contents, and agree to abide by all the provisions herein:

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FIGURES
Routes to Hospital and Walk-in Medical Clinic







Notes

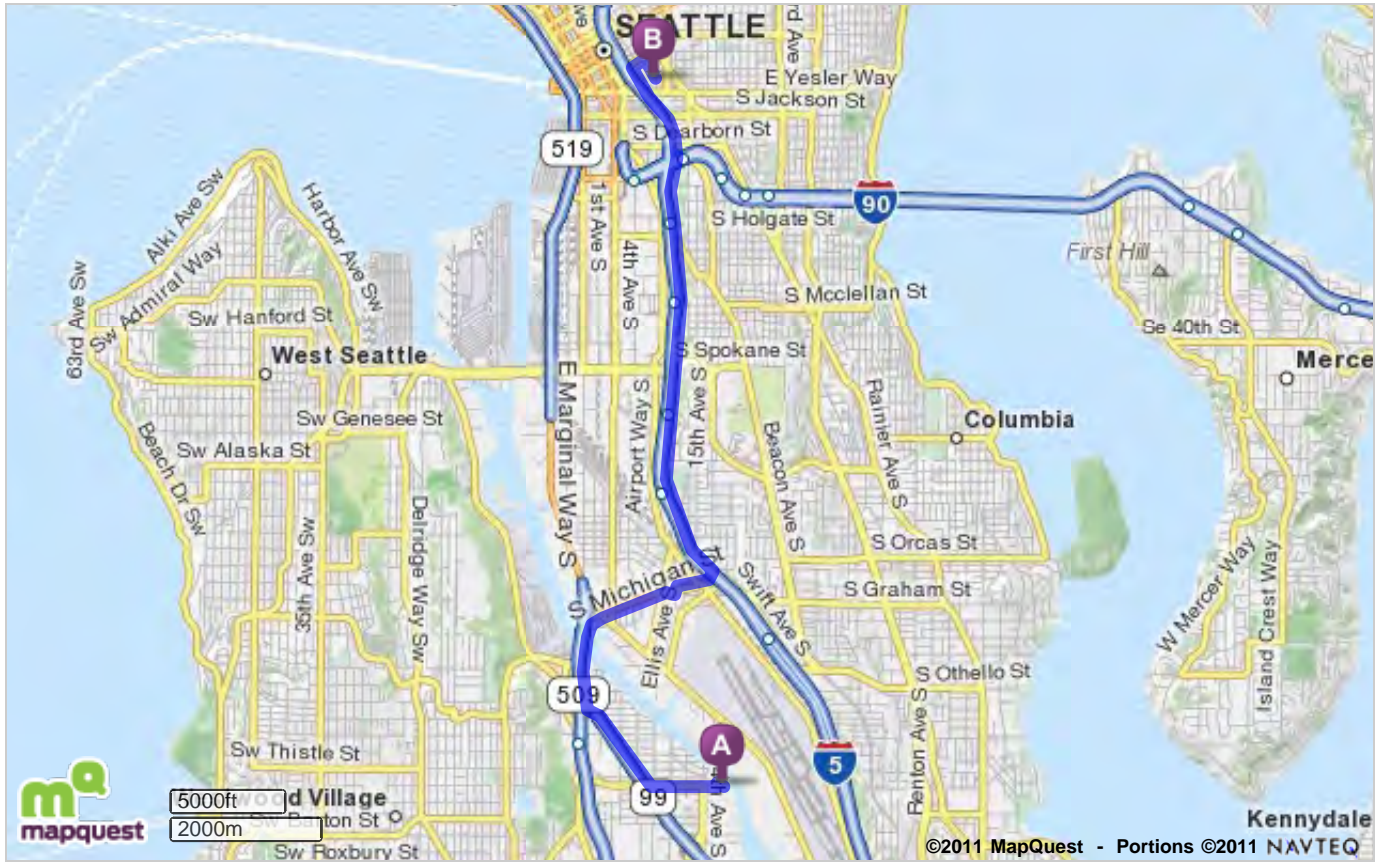
Figure 1: Route to Hospital Map

Trip to:
 Harborview Medical Center
 325 9th Ave
 Seattle, WA 98104
 (206) 223-3000
7.41 miles
14 minutes

| | 8700 Dallas Ave S Seattle, WA 98108-4855 | Miles Per Section |
|--|---|--------------------------|
| | 1. Start out going WEST on DALLAS AVE S toward 16TH AVE S. | Go 0.05 Mi |
| | 2. Take the 1st LEFT onto 16TH AVE S. <i>If you reach 14TH AVE S you've gone a little too far</i> | Go 0.03 Mi |
| | 3. Take the 1st RIGHT onto S CLOVERDALE ST. <i>If you reach S DONOVAN ST you've gone a little too far</i> | Go 0.5 Mi |
| | 4. Merge onto WA-99 N. <i>If you reach 7TH AVE S you've gone a little too far</i> | Go 0.7 Mi |
| | 5. Merge onto WA-509 N / WA-99 N / 1ST AVE BRIDGE S toward SEATTLE. | Go 0.7 Mi |
| | 6. Take the MICHIGAN ST exit toward I-5. | Go 0.2 Mi |
| | 7. Keep LEFT at the fork to go on S MICHIGAN ST. | Go 0.5 Mi |
| | 8. S MICHIGAN ST becomes S BAILEY ST. | Go 0.06 Mi |
| | 9. Merge onto I-5 N via the ramp on the LEFT toward VANCOUVER BC. <i>If you reach FLORA AVE S you've gone a little too far</i> | Go 3.1 Mi |
| | 10. Take the DEARBORN ST / JAMES ST exit, EXIT 164A, toward MADISON ST. | Go 1.0 Mi |
| | 11. Take the JAMES ST exit. | Go 0.3 Mi |

| | | |
|--|--|------------------|
|  | <p>12. Turn RIGHT onto JAMES ST. <i>If you are on 7TH AVE and reach CHERRY ST you've gone a little too far</i></p> | Go 0.1 Mi |
|  | <p>13. Take the 1st RIGHT onto 9TH AVE. <i>If you reach TERRY AVE you've gone a little too far</i></p> | Go 0.2 Mi |
|  | <p>14. 325 9TH AVE is on the RIGHT. <i>Your destination is 0.1 miles past JEFFERSON ST</i> <i>If you reach ALDER ST you've gone a little too far</i></p> | |
|  | <p>Harborview Medical Center 325 9th Ave, Seattle, WA 98104 (206) 223-3000</p> | 7.4 mi |

Total Travel Estimate: 7.41 miles - about 14 minutes



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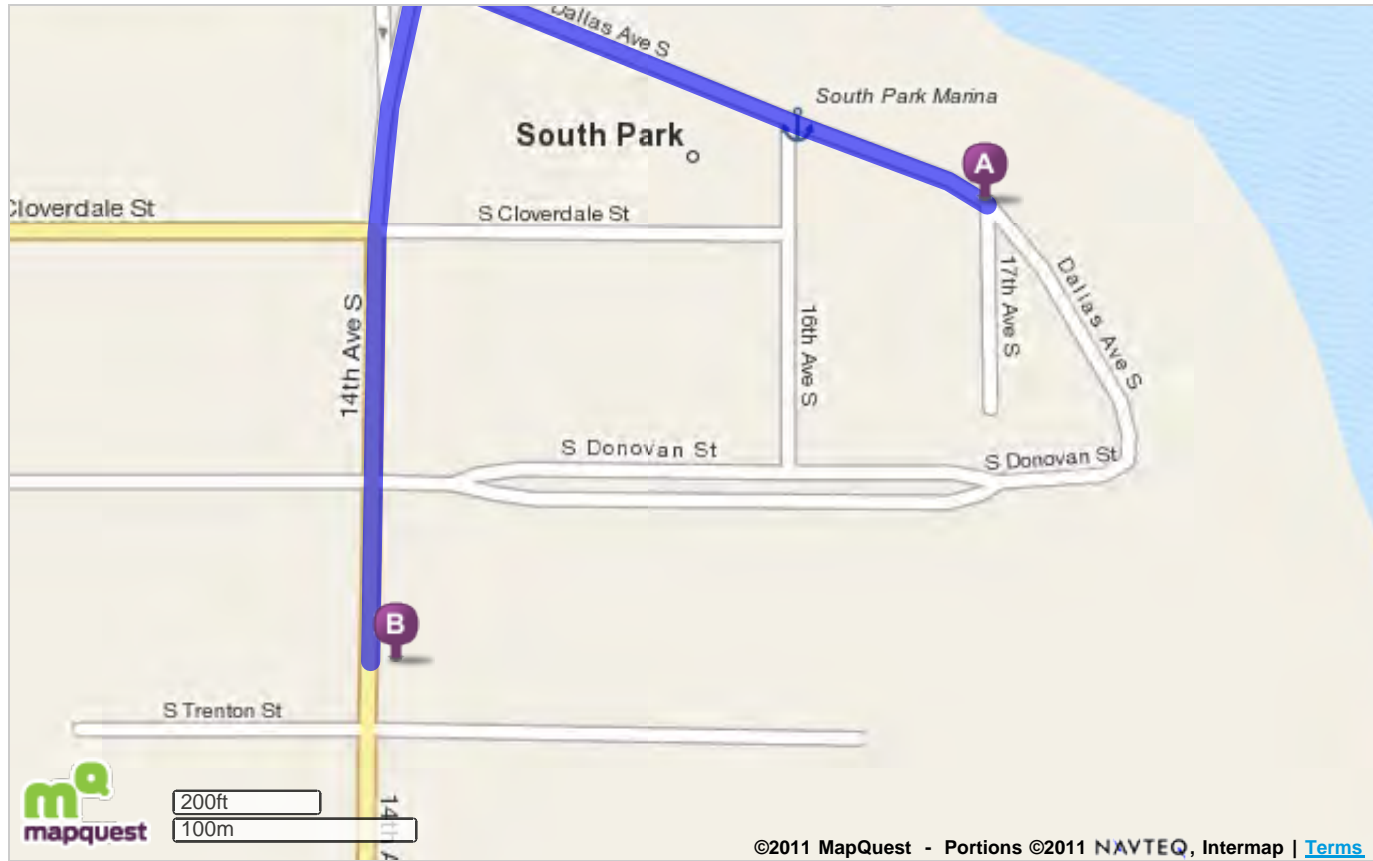
Trip to:
 8720 14th Ave S
 Seattle, WA 98108-4807
0.31 miles
1 minute

Notes

Figure 2: Route to Walk-in Medical Clinic
 Sea Mar Community Health Clinic

| A | 8700 Dallas Ave S Seattle, WA 98108-4855 | Miles Per Section | Miles Driven |
|---|--|--------------------------|---------------------|
| ● | 1. Start out going WEST on DALLAS AVE S toward 16TH AVE S. | Go 0.1 Mi | 0.1 mi |
| ↩ | 2. Take the 2nd LEFT onto 14TH AVE S. <i>If you reach S SULLIVAN ST you've gone a little too far</i> | Go 0.2 Mi | 0.3 mi |
| ■ | 3. 8720 14TH AVE S is on the LEFT. <i>Your destination is just past S DONOVAN ST</i> <i>If you reach S TRENTON ST you've gone a little too far</i> | | 0.3 mi |
| B | 8720 14th Ave S Seattle, WA 98108-4807 | 0.3 mi | 0.3 mi |

Total Travel Estimate: **0.31 miles - about 1 minute**



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