Final
Engineering Design Report
Former Scott Paper Company Mill Site
Anacortes, Washington
Ecology Consent Decree No.
09-2-01247-7

March 11, 2010

Prepared for

Washington State Department of Ecology

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Disclaimer: This Engineering Design Report (EDR) has been prepared by GeoEngineers Inc. and Anchor Environmental, L.L.C. as a joint document for the planned cleanup of the former Scott Paper Mill Site (Site) located in Anacortes, Washington. The primary objective of this EDR is to describe the plans and procedures for cleanup of the Site. Under this joint document, GeoEngineers has completed all sections pertaining to the Phase 1, Phase 2 and Phase 3 Cleanup Actions for the Site. Anchor Environmental, L.L.C. has completed all sections pertaining to the Phase 4 Cleanup Action for the Site.

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FINAL
ENGINEERING DESIGN REPORT
FORMER SCOTT PAPER COMPANY MILL SITE
ANACORTES, WASHINGTON
ECOLOGY CONSENT DECREE NO. 09-2-01247-7
FOR
WASHINGTON STATE DEPARTMENT OF ECOLOGY

1.0 INTRODUCTION

This Engineering Design Report (EDR) has been prepared for the planned cleanup of the former Scott Paper Mill Site (Site) located in Anacortes, Washington (Figure 1). Parties responsible for cleanup of the Site include the Port of Anacortes (Port), MJB Properties, LLC (MJB), and Kimberly Clark Corporation (K-C). The Port and K-C are leading the cleanup efforts on the northern upland portion of the Site (referred to as the Port Uplands Area) and the marine portion of the Site offshore of the northern and southern upland areas (referred to as the Marine Area, which includes the offshore portions of the Port and MJB properties). K-C and MJB are leading the cleanup efforts on the southern upland portion of the Site (referred to as the MJB North Area). A site plan showing the Port Uplands Area, the MJB North Area, and the Marine Area is shown in Figure 2.

This document has been prepared to meet to the requirements of the Washington State Model Toxics Control Cleanup Act (MTCA), administered by the Washington State Department of Ecology (Ecology) through the MTCA rules, Chapter 173-340 of the Washington Administrative Code (WAC), and the Sediment Management Standards (SMS), Chapter 173-204 WAC. The cleanup action is being conducted under a Consent Decree (No. 09-2-01247-7) with Ecology.

In cooperation with K-C and MJB, the Port is working with Ecology to address contamination at the Site resulting from the former paper and pulp mill operations. A Remedial Investigation and Feasibility Study (RI/FS) has been prepared for the Site and approved by Ecology (GeoEngineers et al., 2008), and a Cleanup Action Plan (CAP) has been issued by Ecology (Ecology, 2009). The Site cleanup action is scheduled to begin on upland portions of the Site in June 2009.

The primary objective of this EDR is to describe the plans and procedures for cleanup of the Site, including compliance monitoring plans. The major project elements discussed include:

- Site background
- Nature and extent of contamination
- Cleanup standards
- General description of cleanup action
- Permits
- Site preparation
- Soil excavation, sediment dredging, and disposal
- Wave attenuation structure construction
- Site restoration
- Institutional controls

- Compliance monitoring
- Contingencies
- Financial assurance
- Quality assurance/quality control (QA/QC)
- Health and safety
- Schedule and reporting

2.0 BACKGROUND INFORMATION

This section describes the Site's environmental setting; historical, current, and planned future uses; previous site investigations and cleanup actions; and the associated regulatory framework.

2.1 SITE LOCATION AND CURRENT LAND USE

The Site is located in Anacortes, Washington, and is bounded on the south by 20th Street, on the west by Q Avenue, on the east by Fidalgo Bay, and on the north by Cap Sante Boat Haven and 15th Street (Figure 1).

The upland portion of the Site (approximately 42 acres) consists of the Port Uplands Area and the MJB North Area (Figure 2). The Port Uplands Area is further divided into three sub-areas (Port Parcels 1, 2, and 3) based on land use and current ownership. The Marine Area comprises the contiguous aquatic lands adjacent to the Port Uplands and MJB North Areas and includes the 75-foot wide shoreline buffer zone located landward of the mean higher-high water line (MHHW). The Marine Area is bounded by the Federal channel to the north, the inner harbor line to the east, and the MJB southern property line to the south. The Marine Area is addressed as one contiguous area in this document because of overlapping sediment conditions and common sediment transport pathways. The 75-foot wide shoreline buffer zone is the interface between the uplands and marine areas of the Site and is considered part of the Marine Area for the purposes of the cleanup action.

Port Parcels 1 and 3 and the adjacent aquatic lands are owned by the Port. Port Parcel 2 was previously owned by the Port; it currently consists of several sub-parcels owned by three entities: Northwest Educational Service District 189, Anacortes Concepts LLC, and Seafarers' LLP. Port Parcel 1 is currently undeveloped. Port Parcel 2 is partially developed with office buildings, parking, and landscaped areas. Port Parcel 3 consists of Seafarers' Memorial Park (including grass, landscaped areas, and a Park Building) and asphalt-paved roads and parking areas. The Port-owned portion of the Marine Area is part of Seafarers' Memorial Park. The MJB-owned portion of the Marine Area is currently unused. The marine portion of the remediation area east of the inner harbor line is owned by the State of Washington and managed by the Port under a Management Agreement.

2.2 FUTURE LAND USE

The Port Uplands Area is expected to continue to be used in its current configuration, with commercial uses on Parcel 2 and Seafarers' Memorial Park on Parcel 3. Construction of a Marine Skills Center is scheduled to begin on Parcel 1 in the summer of 2009. MJB has made a preliminary determination that a water and water-view-dependent mixed-use development, with a residential component, is a viable future development option for the MJB North Area.

2.3 SITE HISTORY

The former Scott Paper Mill was located in Anacortes, Washington, on the west shore of Fidalgo Bay. The development of the shoreline as an industrial area began in the late 1800s. Prior to development of the Site, the area was largely a shallow tideland. In 1892, a lumber mill was built at the Site that extended on timber piling into Fidalgo Bay. The lumber mill was located in the area referred to as the Port Uplands Area (Figure 2). Wharves and offshore log rafts were present in much of the northern portion of the Marine Area (extending from the shoreline to about the inner harbor line) until the late 1940s. Between approximately 1890 and 1940, approximately 5 to 20 feet of fill materials including sawdust and mill refuse were placed throughout the former tide flat beneath and adjacent to the wharves, also extending into the MJB North Area.

In 1925, a pulp mill was constructed at the property referred to as the MJB North Area. Pulp was produced using an acid-sulfate process using byproducts from the lumber mill. In 1940, Scott Paper purchased the pulp and lumber mills, and operated the facilities until 1955. Process improvements by Scott Paper included the conversion to an ammonium sulfite process in 1952, the construction of a 16-inch effluent pipeline to Guemes Channel and an on-site surge pond for the pipeline in May 1951, and the addition of pulp bleaching facilities in 1955. Effluent was discharged directly into Fidalgo Bay from 1925 to 1951. A knots and tailings pond was constructed in 1959, on what is now Port Parcel 2, to reduce settleable solids in the mill's effluent. Materials known to have been utilized at the former pulp mill include petroleum, sulfur, anhydrous ammonia, ammonium hydroxide, and chlorine. Bunker C and diesel fuels were used to generate power and operate equipment. The pulp mill closed in 1978. Scott Paper was acquired by K-C in December 1995.

The former Scott Paper Mill operations were bounded by Cap Sante Boat Haven to the north, Fidalgo Bay to the east, and Q Avenue to the west. To the south, the maximum extent of former Scott Paper Mill operations was approximately 20th Street. Site boundaries are depicted in Figure 2. In 1978 and 1979, the Port purchased the northern portion of the Site. The southern portion of the Site was purchased by the Snelson-Anvil Corporation in 1979, and has been owned by MJB since 1990. In 1999, Sun Healthcare Systems, Inc. (SHS) purchased Parcel 2 from the Port and, following initial cleanup and redevelopment (see below), subsequently subdivided and sold Parcel 2 into four sub-lots. In 2008, the Port acquired a narrow strip of the Marine Area between the Port and MJB properties.

2.4 PREVIOUS SITE INVESTIGATIONS AND CLEANUP ACTIONS

This section summarizes previous investigations and cleanup actions at the Site.

2.4.1 Previous Site Investigations

Detailed investigations of Port Parcel 2 were performed by ThermoRetec (ThermoRetec, 1999a), followed by preparation of a soil CAP for this area (ThermoRetec, 1999b).

Between 2004 and 2008, the Port conducted environmental investigations of Port-owned property pursuant to Consent Decree No. 03-2-00492-1 dated March 21, 2003. The work required under this Consent Decree included preparation of an RI/FS for soil at Port Parcels 1 and 3, groundwater throughout the Port Uplands Area, and marine sediments offshore of the Port Uplands Area.

Concurrent investigations of the MJB North Area were performed under Agreed Order No. DE 1783 dated January 27, 2005 between K-C and Ecology. The work required under this Agreed Order included preparation of an RI/FS for soil and groundwater at the MJB North Area and marine sediments offshore of the MJB North Area. K-C conducted the marine sediment investigation. MJB (pursuant to agreements with K-C) performed the upland soil and groundwater investigation.

In addition to the work described above, Consent Decree No. 03-2-00492-1 and Agreed Order No. DE 1783 also required the Port and K-C, respectively, to address any remaining site-wide RI/FS issues. To ensure that site-wide issues were efficiently addressed, the Port, K-C, and MJB combined the various required elements of the Consent Decree and Agreed Order into a single site-wide RI/FS report. The final RI/FS report (GeoEngineers et al., 2008) was approved by Ecology on December 16, 2008. A CAP describing the site-wide cleanup action selected for the Site was issued by Ecology in May 2009 (Ecology, 2009).

2.4.2 Previous Cleanup Actions

Following detailed investigations of Port Parcel 2 (ThermoRetec, 1999a) and preparation of a soil CAP for this area (ThermoRetec, 1999b), a partial cleanup of Parcel 2 was completed by SHS, with oversight by Ecology under the MTCA Voluntary Cleanup Program (VCP). The Parcel 2 cleanup included removal and off-site landfill disposal of 3,469 tons of petroleum-contaminated soil, soil capping, and restrictive covenants to prevent future exposure to subsurface soil and to prevent groundwater use for drinking water. Work also included the installation of a sheet pile wall along the shoreline for containment of residual contaminated soil in the southeastern portion of Parcel 2. A completion report for the Parcel 2 cleanup action was submitted to Ecology in 2000 (ThermoRetec, 2000).

In 2000, Ecology issued a No Further Action (NFA) letter for diesel- and heavy oil-range petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), dioxins/furans, wood debris, and metals in soil at Parcel 2 (Ecology, 2000). The NFA letter was contingent on long-term groundwater monitoring to ensure continued environmental protection. However, in 2005 Ecology modified the type of written opinions it provides under the VCP, and stopped providing NFA letters for a single medium such as soil (Ecology, 2005). Consequently, Ecology rescinded the NFA letter on September 26, 2006, as the Parcel 2 cleanup did not address all contamination in all media at the Site.

Storm-generated wave and current action has resulted in continuous erosion of the shoreline fill, which has contributed to contaminant transport from the upland to the Marine Area (GeoEngineers et al., 2008). The shoreline along portions of the Port and MJB properties has been temporarily reinforced to minimize this erosion, and protection of the shoreline has required routine maintenance by the Port and MJB. In February, 2005 the Port completed a Bank Stabilization Interim Action along the Seafarers' Memorial Park shoreline under Consent Decree No. 03-2-00492-1 (Landau Associates, 2005).

In 2008, the Port installed two underground storage tanks at Parcel 3. An interim action was completed to address contaminated soil and wood debris excavated during the tank installation. An interim action completion report was prepared by the Port to document these activities (GeoEngineers, 2009).

2.5 SITE GEOLOGY AND HYDROLOGY

This section summarizes the geology and hydrogeology of the Site. The discussion is based on the results of the Site environmental investigations completed to date.

2.5.1 Uplands Areas

Site soils consist of multiple layers of fill overlying native marine sediment and glacial deposits. Shallow soil is predominantly gravel and sand fill material with occasional mixed wood debris. The deeper subsurface fill contains a heterogeneous mixture of soil and wood debris. Extensive wood debris deposits of varying thickness are present throughout much of the Port Uplands Area, extending from approximately 5 to 20 feet below ground surface (bgs), and continuing into the intertidal and shallow subtidal areas of Fidalgo Bay. Fill material containing wood debris is also found in the MJB North Area along the shoreline. The thickness of the wood-containing fill material in the MJB North Area ranges from less than 1 foot near the former mill surge ponds to nearly 15 feet at the shoreline.

Two hydrogeologic units have been identified in the uplands area: a shallow water-bearing unit and a deeper confining unit. The shallow water-bearing unit occurs in the fill material, and the depth to groundwater in this unit ranges from 3 to 12 feet bgs (7 to 15 feet saturated thickness) across the Site. The confining unit underlies the shallow water-bearing unit and consists of native marine silts and clays. The thickness of the confining unit is greater than 2 to 10 feet throughout the Site.

The predominant inferred groundwater flow direction is to the north toward Cap Sante Waterway in the northern portion of the Site, and to the east and southeast toward Fidalgo Bay in other areas of the Site. Groundwater flow directions in the interior of the Site do not appear to be significantly affected by tidal fluctuations. However, groundwater monitoring data suggest that hydraulic gradients decrease, or possibly reverse temporarily, at high tide in the vicinity of some of the shoreline wells.

2.5.2 Marine Area

A debris field consisting of dimensional lumber, wood fragments, and other debris is present in the Marine Area sediments, most extensively across the intertidal area of the northern Marine Area. The entire shoreline in the vicinity of the Site consists of fill materials including brick, concrete, riprap, timber piles, and other debris intermixed with sand, gravel, and finer sediments.

The Washington State Department of Natural Resources (DNR) has classified the intertidal substrate near the Site as mixed fine, mixed coarse, and artificial materials (Antrim et al., 2000). Intertidal sediments adjacent to the MJB North Area generally consist of silt and sand materials, with rocks along the upper intertidal area. Along the northern portion of the Marine Area near Seafarers' Memorial Park, sediments are coarse-grained, ranging to rock and cobble in size, and contain debris.

Overlying the native sediments in the northern portion of the Marine Area is fill that contains wood debris. This fill is thickest near the shoreline and tapers out in the Marine Area; the fill thickness in parts of the northern portion of the shoreline ranges from approximately 10 to 15 feet. The wood debris content (based on visual observations) of surface sediments ranges from greater than 75 percent near the shoreline to less than 5 percent near the inner harbor line, and generally decreases with distance to the south. Overlying the wood-containing fill along the northern portion of the shoreline is 10 to 15 feet of granular fill consisting of poorly-graded sand and silt or fine sand.

Subtidal areas adjacent to the Site are generally unvegetated (City of Anacortes, 1999; Antrim et al., 2000). Areas farther offshore contain eelgrass beds (*Zostera spp.*) of varying quality and density.

A detailed discussion of the Marine Area environmental setting (including geology/hydrology) is provided in the RI/FS report (GeoEngineers et al., 2008).

3.0 NATURE AND EXTENT OF CONTAMINATION

As noted above, in 2008 a site-wide RI/FS was completed by the Port, K-C, and MJB (GeoEngineers et al., 2008). The RI used information about the history and environmental conditions of the Site gathered during multiple environmental investigations to characterize the nature and extent of contamination. The nature and extent of contamination in soil, sediment, and groundwater are summarized in Sections 3.1 through 3.3 (additional details are provided in the RI/FS report [GeoEngineers et al., 2008]). The cleanup levels referenced below are discussed further in Section 4.2.1.

3.1 SOIL

A variety of metals (antimony, arsenic, chromium, copper, lead, mercury, nickel, and zinc), diesel- and heavy oil-range petroleum hydrocarbons, PCBs, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and dioxins/furans have been detected at the Port Uplands Area at concentrations above the cleanup levels established for the Site (GeoEngineers et al., 2008). In addition, metals (antimony, arsenic, copper, lead, thallium, and zinc) and cPAHs were identified in Marine Area shoreline soils at the MJB North Area at concentrations above cleanup levels.

The only constituent detected above cleanup levels in shallow surface soil (0 to 2 feet bgs) at the Port Uplands Area was arsenic. At depths greater than 2 feet bgs, arsenic was detected above the associated cleanup level in subsurface soil in an isolated area near the northeastern corner of Port Parcel 1. Multiple constituents were detected above cleanup levels in subsurface soil at Port Parcel 2, including metals (antimony, arsenic, chromium, copper, lead, mercury, nickel, and zinc), diesel- and heavy oil-range petroleum hydrocarbons, PCBs, cPAHs, and dioxins/furans. These exceedances were concentrated in two areas: 1) the rectangular parking lot near the center of Parcel 2 (elevated diesel- and heavy oil-range petroleum hydrocarbons); and 2) the area located behind the sheet pile containment wall in the southeastern portion of Parcel 2. A similar range of constituents was detected above cleanup levels in subsurface soil at Parcel 3, particularly along portions of the shoreline of Seafarers' Memorial Park and near the present southern end of R Avenue.

Metals (antimony, arsenic, chromium, copper, lead, nickel, thallium, and zinc) and cPAHs were detected above cleanup levels in soil at the MJB North Area (primarily in the 75-foot wide Marine Area shoreline buffer zone). The majority of these exceedances appear to be limited to localized areas within the wood debris and woody fill layers present between roughly 4 and 10 feet bgs. However, cleanup level exceedances (primarily arsenic, as well as lead, chromium, copper, zinc, and cPAHs) also occur in the surface fill layer (0 to 2 feet bgs) at a number of locations throughout the MJB North Area. To further delineate cleanup level excedances in the surface fill layer, supplemental test pits and sampling were completed in July 2009 (see Appendix I for a more detailed discussion of the fieldwork). In addition, sampling along the Project haul road was performed to characterize the surface fill within the roadway footprint. The results of these studies identified isolated locations with elevated metals and cPAHs as shown on Figure 3. These new data were incorporated into the remedial design discussed in Sections 4.4.4 and 9.

3.2 SEDIMENT

A debris field consisting of dimensional lumber, wood fragments, and other debris is present on the sediment surface, most extensively across the intertidal area of the northern Marine Area, extending to shoreline areas adjacent to the MJB North Area. The wood debris content (based on visual observations) of surface sediments ranges from greater than 75 percent near the shoreline to less than 5 percent near the inner harbor line. A number of decaying piles also are present. Sediment bioassays were performed to develop site-specific cleanup levels for wood debris content and total volatile solids (TVS) that are protective of sediment habitats (Ecology, 2009).

Chemical analytical results for sediment samples collected throughout the Marine Area during 2004 to 2008 and previous investigations were compared in the RI/FS to SMS chemical criteria to identify constituents of potential concern for the offshore portions of the Site (GeoEngineers et al., 2008). Sediment samples collected from the intertidal beach area immediately offshore of the Site contained several metals (copper, lead, mercury, and zinc) and PCBs at concentrations above sediment quality standards (SQS) chemical criteria. The sampling data define a localized area of elevated metals and PCBs within the intertidal zone of the southern Marine Area. As discussed in the RI/FS, an evaluation of available tissue sampling data conducted by Ecology, the U.S. Environmental Protection Agency (USEPA), and others showed no evidence of bioaccumulation of mercury, PCBs, or dioxins/furans in crabs or shellfish within the portion of Fidalgo Bay potentially affected by Site releases.

To ensure protection of human health, the RI/FS considered potential bioaccumulation risks associated with residual mercury and PCB exposure that may remain in the Marine Area following completion of the cleanup action. The potential bioaccumulation risks were assessed in the RI/FS report, and revealed that remediation of those Site sediments exceeding SQS chemical criteria would be protective of potential human health mercury and PCB bioaccumulation risks.

Based on the findings of the RI/FS, surface sediments in upper intertidal portions of the Marine Area immediately adjacent to portions of Port Parcel 3 and the MJB North Area required evaluation of cleanup action alternatives due to the presence of constituents exceeding cleanup levels (GeoEngineers et al., 2008). A likely source of these localized contaminated sediment deposits is historical and potentially ongoing erosion of adjacent upland fill material comprising the shoreline. These fill materials have been documented to contain elevated metal and PCB chemical concentrations, similar to those identified in the adjacent sediments. As discussed in the RI/FS, shoreline stabilization performed by the Port in this area appears to have reduced transport of metals and PCBs to the southern Marine Area in the last several years. Surface and subsurface woody debris deposits in this area also required evaluation of cleanup action alternatives due to the presence of these potentially deleterious substances at concentrations exceeding the cleanup levels established to protect aquatic ecological receptors at the Site.

3.3 GROUNDWATER

Sporadic exceedances of petroleum hydrocarbons, arsenic, sulfide, bis(2-ethylhexyl)phthalate, and ammonia were detected in groundwater at the Site. Based on detailed evaluations presented in the RI/FS report (GeoEngineers et al., 2008), the nature and extent of groundwater contamination at the Site can be summarized as follows:

- **Port Uplands Area Interior Monitoring Wells**. Groundwater in interior (inland) wells at the Port Uplands Area has been found to generally contain low concentrations of contaminants that are below the Site cleanup levels. One isolated detection of dissolved arsenic was reported at a concentration marginally exceeding the associated cleanup level at well MW-111. Total and/or dissolved arsenic was also detected at concentrations exceeding the cleanup level during four monitoring events at well MW-102. Diesel- and heavy oil-range petroleum hydrocarbons were detected at concentrations above cleanup levels during one monitoring event at well MW-110, and free-phase petroleum product was observed during two monitoring events at well MW-110, at measured thicknesses of 0.03 feet and 0.6 feet. In addition, diesel- and heavy oil-range hydrocarbons were detected at concentrations above cleanup levels in an unfiltered groundwater grab sample (GEI24-W) obtained from a direct-push boring completed at the southeast corner of the Seafarers' Park Building during a supplemental soil investigation completed at the Port Uplands Area in September 2008.

- **Port Uplands Area Shoreline Monitoring Wells**. Groundwater in shoreline wells at the Port Uplands Area, which are located landward of the groundwater/surface water interface in the porewater discharge zone, was found to not contain contaminants at concentrations exceeding cleanup levels. A few sporadic detections of ammonia, sulfide, and bis(2-ethylhexyl)phthalate have been reported in these wells.
- **MJB North Area Interior Monitoring Wells**. At one interior well (MW-4), dissolved arsenic was detected in groundwater at concentrations exceeding the associated cleanup level. Groundwater at the other MJB North Area interior well (MW-7) does not contain contaminants at concentrations above cleanup levels.
- **MJB North Area Shoreline Monitoring Wells**. Groundwater in shoreline wells at the MJB North Area, which are located landward of the groundwater/surface water interface in the porewater discharge zone, was found to not contain contaminants at concentrations exceeding cleanup levels.

As detailed in the RI/FS report (GeoEngineers et al., 2008), direct human ingestion of hazardous substances in groundwater is not a potential exposure pathway, because groundwater at the Site or potentially affected by the Site is not a current or reasonably likely future source of drinking water. Groundwater in the shoreline area of the Site was determined to be protective of marine surface water.

4.0 CLEANUP ACTION

The site-wide cleanup action includes uplands area soil removal, Marine Area sediment and wood debris removal, and site restoration. This section provides a summary of the cleanup action objectives, cleanup standards, and a general description of the proposed cleanup action.

4.1 CLEANUP ACTION OBJECTIVES

The objectives of the cleanup action are to:

- Prevent terrestrial ecological and human contact with soil containing contaminant concentrations exceeding site-specific cleanup levels based on risks to respective receptors.
- Prevent contamination of groundwater and surface water through potential transfer of petroleum hydrocarbons and other contaminants from soil to groundwater (i.e., remove source of free-phase petroleum product at monitoring well MW-110 and the majority of contaminated soils exceeding MTCA cleanup levels at other locations).
- Confirm no migration of contaminated groundwater to adjacent soil and sediment or future impacts to surface water.
- Remove source material in the shoreline buffer zone with the potential to cause contamination of Marine Area sediments, thus preventing contamination/recontamination of adjacent Marine Area sediments due to shoreline erosion.
- Remove sediments and debris exceeding cleanup levels.
- Prevent further erosion of the shoreline and limit the potential for sediment recontamination.
- Prevent aquatic ecological and associated food-web exposures to sediment containing contaminant concentrations exceeding sediment cleanup levels.

4.2 CLEANUP STANDARDS

Cleanup standards consist of: 1) cleanup levels that are protective of human health and the environment; and 2) the point of compliance at which the cleanup levels must be met. Site-specific cleanup levels and points of compliance for indicator hazardous substances were established in the CAP (Ecology, 2009) and are summarized in this section.

4.2.1 Cleanup Levels

Site-specific cleanup levels for indicator hazardous substances in soil, groundwater, and sediment are discussed below. Details regarding the derivation of these cleanup levels are provided in the CAP (Ecology, 2009).

4.2.1.1 Soil

Soil cleanup levels for the Site are presented in Table 1. Soil cleanup levels for unrestricted land use were developed in accordance with WAC 173-340-740, conservatively assuming potential future ground-floor residential land use. Soil cleanup levels will apply to soil from 0 to 15 feet bgs. Site-specific soil remediation levels applicable to the shoreline buffer zone are also presented in Table 1 (see Section 4.2.1.3).

4.2.1.2 Groundwater

Groundwater cleanup levels for the Site are presented in Table 2. As discussed in the CAP (Ecology, 2009), human ingestion of hazardous substances in groundwater is not a potential exposure pathway because groundwater at the Site or potentially affected by the Site is not a current or reasonable future source of drinking water. Consequently, the Site groundwater qualifies as a non-potable water source.

Arsenic and/or petroleum hydrocarbons were detected in groundwater in interior monitoring wells at concentrations exceeding cleanup levels protective of marine surface water, although concentrations detected in monitoring wells along the shoreline (at or near the groundwater/surface water interface) comply with cleanup levels. However, as a result of planned remedial excavation of contaminated soil, other contaminants detected in Site soils could potentially be mobilized in groundwater. Consequently, post-construction confirmational groundwater monitoring will include all indicator hazardous substances that have been identified in Site soils (Ecology, 2009).

4.2.1.3 Sediment

Sediment cleanup levels were developed by Ecology according to SMS requirements. SMS criteria (WAC 173-204-320 and -520) include marine sediment quality standards (SQS – concentrations below which effects to benthos are unlikely) and cleanup screening levels (CSLs – concentrations above which more than minor adverse biological effects may be expected). The SQS criteria were selected as sediment cleanup levels for the Site, although CSLs were used to develop appropriate shoreline soil remediation levels to ensure long-term sediment protection (Ecology, 2009).

Sediment cleanup levels are presented in Table 3. No promulgated SMS criteria exist for wood debris in sediment. Consequently, sediment bioassays were performed to develop site-specific cleanup levels for wood debris content and TVS that are protective of sediment habitats (GeoEngineers et al., 2008; Ecology, 2009). Based on interpretation of the available biological data, surface sediment TVS levels greater than 12.2 percent (dry-weight basis) and/or wood debris content greater than 25 percent (by volume) were identified as having the potential for site-specific deleterious effects exceeding SQS biological criteria.

There are also no promulgated SMS criteria for diesel- and heavy oil-range hydrocarbons. Based on Ecology's review of sediment bioassay data from other MTCA sites with relatively weathered hydrocarbons, the MTCA Method A cleanup level for diesel- and heavy oil-range hydrocarbons in soil is predicted to be protective of sediment and aquatic life exposures. Accordingly, the MTCA Method A soil cleanup level for diesel- and heavy oil-range hydrocarbons (2,000 milligrams per kilogram [mg/kg]) was adopted as the sediment cleanup level for these constituents.

4.2.2 Points of Compliance

Under MTCA, the point of compliance is the point or location on a site where the cleanup levels must be met. This section describes the points of compliance for soil, groundwater, and sediment.

4.2.2.1 Soil

The standard point of compliance for the soil cleanup levels shown in Table 1 will be throughout the soil column from the ground surface to 15 feet bgs, in accordance with WAC 173-340-740(6)(d) and WAC 173-340-7490(4)(b). For potential terrestrial ecological exposures, MTCA regulations allow a conditional point of compliance to be established from the ground surface to 6 feet bgs (the biologically active zone according to MTCA default assumptions), provided that environmental covenants are used to address potential excavation of deeper soil (WAC 173-340- 7490[4][a]). Accordingly, in areas of the Site where potential ecological exposures are a concern, and where appropriate environmental covenants can be implemented, a conditional point of compliance for soil concentrations protective of terrestrial ecological receptors will apply throughout the soil column from 0 to 6 feet bgs.

There are limited areas of the Site where attainment of soil cleanup levels within the 0 to 6 feet bgs conditional point of compliance is impracticable, such as immediately adjacent to, or beneath existing buildings or other Site structures. In such localized areas, and consistent with WAC 173-340-740(6)(f), other engineering approaches such as capping the soil with asphalt or concrete pavement, or placement of an indicator layer and clean soil cap (similar to cleanup actions previously implemented at Port Parcel 2; ThermoRetec, 2000) will provide the necessary environmental protection.

4.2.2.2 Groundwater

Because groundwater cleanup levels are based on protection of marine surface water and not protection of groundwater as drinking water, Ecology has established a conditional point of compliance for groundwater at the groundwater/surface water interface along the shoreline. Accordingly, shoreline monitoring wells will be used to evaluate compliance with groundwater cleanup levels at the Port Uplands Area.

4.2.2.3 Sediment

The point of compliance for marine sediments is the biologically active surface water habitat zone, which consists of sediments within 10 centimeters of the mudline.

4.3 LOCATION, CHARACTERISTICS, AND QUANTITY OF MATERIALS TO BE REMOVED

This section describes the location, characteristics, and estimated quantity of soil and sediment to be removed during the first three phases of the cleanup action. As described in Section 4.4, these three cleanup phases will address the inland portion of the Port Uplands Area and the entire Marine Area (including the 75-foot shoreline buffer zone on Port and MJB properties and the adjacent aquatic lands). The fourth cleanup phase will address the inland portion of the MJB North Area. Locations and quantities of soil to be removed from the inland portion of the MJB North Area are discussed in Section 9.0.

4.3.1 Soil

Planned soil excavations (remedial excavation areas) in the Port Uplands Area are shown in Phase 1 Sheets G1.1 and C3.0 (Phase 1 cleanup action) and Phase 2 Sheets G1.1, C1.0, and C1.1 (Phase 2 cleanup action). For the Port Uplands and Marine Area cleanup actions, up to approximately 42,700 cubic yards (cy) of soil will be excavated. It is estimated that approximately 24,800 cy of this soil exceeds cleanup levels and will be transported off site for disposal. The remaining 17,900 cy of soil is assumed to be clean overburden that must be excavated to access the deeper underlying contaminated soil. The overburden will be stockpiled on site and sampled to confirm that it does not exceed the soil cleanup levels listed in Table 1. If cleanup levels are not exceeded, the overburden soil will be reused on site as backfill. If the overburden soil is found to contain contaminants exceeding cleanup levels, it will be transported off site to a permitted disposal facility.

- Approximately 13,100 cy of contaminated soil will be removed from seven remedial excavation areas located inland of the 75-foot wide shoreline buffer zone on the Port Uplands Area. The depth of inland soil removal is based on the depth of known contamination, and will range between approximately 6 and 15 feet bgs. Soil excavation in the inland remedial excavation areas will result in approximately 26,200 cy excavated, including approximately 13,100 cy of contaminated soil and 13,100 cy of overburden soil assumed to be clean and suitable for on-site reuse. Approximately 1,700 cy of soil also will be excavated for road construction, utility connections, stormwater drainage, and other infrastructure modifications within the uplands that are necessary to complete the cleanup action at the Site. Soil from these excavations will be stockpiled and characterized for disposal or on-site reuse as necessary.
- Excavations within the 75-foot wide shoreline buffer zone will include removal of approximately 16,500 cy of soil from six remedial excavation areas, of which approximately 11,500 cy has been identified as contaminated and requiring off-site disposal, and approximately 5,000 cy is assumed to be clean overburden suitable for reuse on site as backfill. Contaminated soil in the shoreline buffer zone will be removed to a maximum depth of 10 feet bgs. In addition, approximately 6,500 cy of soil will be excavated between the current MHHW and the proposed alignment of a block retaining wall on the Port Uplands Area (Phase 2 Sheet C1.3). This additional volume is outside of the anticipated extent of contaminated soil but will be characterized to determine suitability for use as clean backfill.

4.3.2 Marine Area Sediment and Debris

Remedial excavation areas for sediment and debris are shown in Phase 2 Sheets C2.0 to C2.3. Up to approximately 44,800 cy of dredged material (consisting of sediment, wood and other debris) will be removed below MHHW to a maximum thickness of 3 feet below the mudline. Derelict exposed timber piles will be removed from these areas concurrent with the sediment and debris removal.

4.4 General Description of Cleanup Action

The cleanup action will be divided into four phases of work (Phases 1 through 4). These phases are described below.

4.4.1 Phase 1 Cleanup Action

Phase 1 of the cleanup action will consist of contaminated soil removal at four remedial excavation areas within the Port Uplands Area (Remedial Excavation Areas 1 through 4; Phase 1 Sheets G1.1 and C3.0). The following tasks will be performed during the Phase 1 cleanup action to address soil contamination:

- Some existing uplands infrastructure, including utilities and paved surfaces, will be removed. This will include demolition, replacement, and relocation of the existing sanitary sewer lift station north of the Park Building to allow better access to the contaminated soil that will be removed during the Phase 2 work.
- Existing sewer lines will be rerouted to a new sewer lift station, to be installed within Remedial Excavation Area 4 near the center of Parcel 2, and the existing sewer lift station will be abandoned.
- Existing water mains, gas mains, and electrical service will be rerouted to allow better access to the contaminated soil during both the Phase 1 and Phase 2 cleanup activities.
- Approximately 1,700 cy of soil is expected to be excavated during the utility rerouting activities. This soil will be characterized for disposal or reuse consideration.
- As part of the traffic control measures for the Site, a haul road will be constructed as an extension of 17th Street. The haul road will extend eastward from Q Avenue to the shoreline, and will provide construction vehicle access during all phases of cleanup action construction.
- A temporary detour road will be constructed east of the Cannery building to facilitate on-site traffic flow and continuous access to the Site buildings during construction.
- Up to approximately 5,700 cy of soil will be excavated to depths of 6 to 10+ feet bgs at four inland remedial excavation areas, including approximately 2,400 cy of contaminated soil impacted by metals and cPAHs, and 3,300 cy of overburden soil assumed to be clean and suitable for reuse on site as backfill (to be confirmed by stockpile sampling).
- Contaminated soil will be transported off site to a permitted disposal facility.
- Excavated areas will be backfilled with clean soil. Excavated overburden soil will be reused on site as backfill if deemed suitable based on physical properties and stockpile sampling to confirm that contaminant concentrations are below the soil cleanup levels listed in Table 1. Imported fill will also be sampled to verify that cleanup levels are not exceeded. Fill material sources will be documented in the construction completion report for the project.
- Utilities, pavement/concrete surfaces, and landscaping interrupted or removed to facilitate soil excavation will be restored.

The Phase 1 cleanup action is described in more detail in Section 6.0 of this report.

4.4.2 Phase 2 Cleanup Action

Phase 2 of the cleanup action will consist of contaminated soil removal at three inland remedial excavation areas within the Port Uplands Area (Remedial Excavation Areas 5 through 7); contaminated soil removal at six remedial excavation areas within the 75-foot wide shoreline buffer zone of the Marine Area (Remedial Excavation Areas 8 through 13); and contaminated sediment and debris removal within the offshore portion of the Marine Area. The Phase 2 soil and sediment removal areas are shown in Phase 2 Sheets G1.1, C1.0, C1.1, and C2.0 to C2.3. The following tasks will be performed during the Phase 2 cleanup action to address soil contamination:

- Some existing upland infrastructure, including utilities and paved surfaces, will be removed to allow better access to the contaminated soil that will be excavated. The Port Park Building will be temporarily moved off site to a nearby Port-owned property to allow access to contaminated soils adjacent to, and possibly below, the building.

- Up to approximately 37,000 cy of soil will be excavated to depths of 1 to 15 feet bgs at three upland and six Marine Area shoreline buffer zone remedial excavation areas, including approximately 21,900 cy of contaminated soil and 15,100 cy of overburden soil assumed to be clean and suitable for reuse on site as backfill (to be confirmed by stockpile sampling).
    - Approximately 20,500 cy of soil will be excavated to total depths ranging from 6 to 15 feet bgs at three inland remedial excavation areas west of the shoreline buffer zone, in the northeastern portion of the Port Uplands Area near the Park Building, including approximately 10,400 cy of contaminated soil impacted by petroleum hydrocarbons, metals, cPAHs, and dioxins/furans, and 10,100 cy of overburden soil assumed to be clean and suitable for reuse on site as backfill.
    - Approximately 16,500 cy of soil will be excavated to depths of 1 to 10 feet bgs at six remedial excavation areas within the Marine Area shoreline buffer zone, including approximately 11,500 cy of contaminated soil impacted by petroleum hydrocarbons, metals, cPAHs, and dioxins/furans, and 5,000 cy of overburden soil assumed to be clean and suitable for reuse on site as backfill.
- Contaminated soil will be transported off site to a permitted disposal facility.
- Excavated areas will be backfilled with clean soil. Excavated overburden soil will be reused on site as backfill if deemed suitable based on physical properties and verification sampling to confirm that contaminant concentrations are below the soil cleanup levels listed in Table 1. Imported fill will also be sampled to verify that cleanup levels are not exceeded. Fill material sources will be documented in the construction completion report for the project.

The following tasks will be performed during the Phase 2 cleanup action to address Marine Area offshore contamination and potential future erosion of shoreline contaminated soils remaining at depth:

- An existing seasonal pier to the east of the Park Building and a timber breakwater at the entrance to the Cap Sante Marina will be removed. The exposed piles from the timber breakwater will be disposed of at a permitted landfill.
- Approximately 47,000 cy of contaminated sediment, wood, and other debris will be removed by dredging or excavation within the Marine Area. The depth of removal will range from approximately 2 feet below the mudline in areas backfilled to grade, to approximately 3 feet below the mudline in areas where a cap will be placed to isolate the underlying materials left in place. Debris and exposed derelict piles will be removed from these areas concurrent with the dredging/excavation.
- The dredged materials will be transported to the Port's Pier 2 dredged material handling facility for dewatering and separation of sediment, large timbers, and other debris into like waste streams prior to transporting the material off site for disposal. Some materials in the intertidal area may require removal by excavation using land-based equipment, as the dredge barge may not be able to access shallow-water portions of this area. Materials removed using land-based equipment may be temporarily stockpiled on the Port Uplands Area for dewatering before the material is transported to the Pier 2 facility for further processing (debris separation) and subsequent transport to an off-site permitted disposal facility. The dredged material placed on a barge will be transported directly to the Pier 2 facility. The Puget Sound Dredged Material Management Program (DMMP) has determined that up to 21,660 cy of the dredged material may be disposed of at the Port Gardner Open Water Disposal site. The remaining dredged material will be transported to an upland disposal facility. Federal and State water quality regulations (see Section 5.6) require that a water quality monitoring plan be prepared to protect marine and fresh

water resources during dredging. A water quality monitoring plan will be prepared by the Port and submitted to Ecology prior to the start of dredging activities.

- Intertidal and subtidal dredged areas will be capped or backfilled with clean imported sand and gravel selected to provide suitable substrate for aquatic organisms living in Fidalgo Bay. The intertidal area that is to be dredged within the North Channel 1 (see Phase 2 Sheet C2.4) will not be backfilled.
- Shoreline capping materials will be placed to achieve proposed grade elevations, mitigate potential future erosion, and improve habitat conditions, as follows:
  - A minimum 2.75-foot-thick capping layer of clean sand, gravel, and armor stone will be placed along the shoreline of the Port property in areas where contaminants will remain at depth, including the shoreline buffer zone.
  - A minimum 2.75-foot-thick capping layer of armor stone will be placed along the shoreline of the MJB property in areas where contaminants will remain at depth, including the shoreline buffer zone. A minimum 0.5-foot-thick top dressing of sand and gravel will be placed in the interstices of the armor stone for habitat improvement purposes.
  - A block retaining wall will be constructed along the southern portion of the Port property shoreline to allow the shoreline to be restored with a more gradual slope and smaller grain-size capping material (Phase 2 Sheets C4.1, C4.2, C4.5, and C4.6). The construction of the block retaining wall will require excavation of soil for placement of a base course foundation beneath the wall. This excavated soil will be stockpiled separately and characterized similar to overburden soil removed for cleanup purposes.
  - A riprap revetment will be constructed along the MJB property shoreline as necessary in areas of shoreline excavation and dredging to match the existing revetment (Phase 2 Sheet C4.4).
- Two wave attenuation structures will be constructed offshore of the Port Uplands Area, to attenuate the impact of waves on the shoreline and mitigate potential future erosion of contaminated soils remaining at depth along the Port property shoreline. The wave attenuation structures will be constructed of rock. Placement of the wave attenuation structures will allow for the removal of the existing treated pile breakwater structure that currently protects the southern portion of the Cap Sante Marina entrance.
- Eelgrass will be planted in subtidal areas to restore impaired aquatic habitat and create new habitat to offset impacts of the constructed wave attenuators.

The Phase 2 cleanup action is described in more detail in Section 7.0 of this report.

4.4.3 Phase 3 Cleanup Action

Phase 3 of the cleanup action will consist of surface restoration and landscaping at the Port Uplands Area and establishment of the eelgrass. Existing walkways will be replaced and new walkways will be constructed, shoreline landscaping in riparian areas will be developed, final grading will be performed, and other public access areas will be developed. The Phase 3 cleanup action is described in more detail in Section 8.0 of this report. Specific design elements of the Phase 3 cleanup action have not been finalized.

4.4.4 Phase 4 Cleanup Action

Phase 4 of the cleanup action will consist of removing approximately 3,000 cy of contaminated shallow soil from four to six remedial excavation areas within the inland portion of the MJB North Area (i.e., west of the 75-foot Marine Area shoreline buffer zone) and at isolated locations within the haul road footprint as shown on the Phase 4 Contract Drawings attached to this report. As discussed in the CAP, these remedial excavations will not extend below 6 feet bgs. Because the haul road must function throughout remedial construction (which is schedule to continue through 2010), Phase 4 will be conducted in two phases: Phase 4A which addresses the primary limits of impacted soil identified in the CAP and Phase 4B which addresses the haul road and any other areas that may be impacted by Phase 2 construction logistics (e.g., the two areas located adjacent to the 75-foot Marine Area shoreline buffer zone). Contract drawings have been prepared for Phase 4A and are attached to this report. Phase 4B drawings will be prepared after the design has been refined based on site conditions after the haul road has been removed.

The following tasks will be performed during the Phase 4 cleanup action to address soil contamination:

- Pipes and other structures associated with the existing stormwater system will be protected and repaired if damaged during remediation. Catch basins and inlets will be protected in accordance with best management practices to prevent remediation end excavation materials from entering the stormwater system.
- Existing water mains, gas mains, and electrical service will be protected if encountered during excavation activities.
- Approximately 3,000 cy of soil will be excavated to depths of 0.5 to 3+ feet bgs at four inland remedial excavation areas and within the haul road footprint. Additional soil may be removed in the event confirmation sampling indicates the contamination extends beyond the initial excavation areas shown on the Phase 4 engineering drawings.
- Contaminated soil will be transported off site to a permitted disposal facility. Approvals are currently being sought from Waste Management and Allied Waste Services (Roosevelt Regional Landfill).
- Some existing uplands infrastructure, including paved surfaces, will be removed.
- Excavated areas will be backfilled with imported clean soil. Fill material sources will be documented in the construction completion report for the project.

5.0 PERMITS

The cleanup action will be performed pursuant to MTCA under the terms of Consent Decree No. 09-2-01247-7. Accordingly, the cleanup action meets the permit exemption provisions of MTCA (WAC 173-340-710[9]), obviating the need to follow the procedural requirements of most State and local laws that would otherwise apply to the action. The cleanup action will, however, comply with the substantive requirements of applicable State and local laws.

The cleanup action will require a U.S. Army Corps of Engineers (USACE) 401/404 permit to conduct sediment and debris removal and site restoration work below MHHW. The Port will obtain the required permits for the project including consultation with Federal agencies under the Endangered Species Act (Section 7) and Ecology for Section 401 State Water Quality Certification. The USACE will be responsible for issuing approval of the project, following Endangered Species Act consultation with the

Federal Natural Resource Trustees, and also incorporating Ecology's Section 401 Water Quality Certification.

Permits and substantive requirements applicable to the cleanup action are discussed below.

5.1 SOLID AND HAZARDOUS WASTE MANAGEMENT

The Washington State Dangerous Waste Regulations (WAC 173-303) will apply to Washington-defined dangerous wastes generated during the cleanup action. Based on evaluation of the soil analytical data generated during the RI/FS, there is the potential to generate dangerous waste during the cleanup. It is assumed that sediments and debris to be removed by dredging during the cleanup action are exempt from the requirements of WAC 173-303, in accordance with the exclusion for dredged material described in WAC 173-303-071(ll). The soil evaluation is summarized below.

Washington State regulates two types of dangerous waste based on the dangerous waste "criteria" published in WAC 173-303-100. These are "toxic" dangerous wastes and "persistent" dangerous wastes. The potential for generation of dangerous waste based on these criteria was evaluated by comparing the soil analytical data from the RI/FS against these criteria. The toxicity and persistence criteria were evaluated using the "book designation method" described in WAC 173-303-100(5) and WAC 173-303-100(6).

The results of the dangerous waste criteria evaluation indicate that soil to be excavated at the Site would not designate as persistent dangerous waste. However, soil to be excavated during the Phase 2 cleanup action in the vicinity of sample locations LSB-2 and RTP-02 along the Port Uplands Area shoreline, and in the vicinity of sample location SB-03 along the MJB North Area shoreline, could potentially designate as toxic dangerous waste (in accordance with the "book designation" criteria) based on previous analytical results (primarily elevated copper concentrations). The determination as to whether soil excavated at these locations actually designates as dangerous waste will be based on representative soil stockpile samples collected during the cleanup.

The Dangerous Waste Regulations also require that contaminants present at the Site be evaluated for the toxicity "characteristic" if they are included on the toxicity characteristic list (WAC 173-303-090[8]). A contaminant has the potential to designate as a dangerous waste if its concentration in soil is greater than 20 times[1] the associated toxicity characteristic threshold listed in WAC 173-303-090(8). In this case, representative samples of the soil need be tested by the toxicity characteristic leaching procedure (TCLP). The results from the TCLP test are then compared directly to the toxicity characteristic threshold. Soil samples obtained from locations PP-16 and PP-25 along the MJB North Area shoreline were previously tested for, and found to fail, the TCLP criterion for lead. In addition, soil to be excavated during the Phase 2 cleanup action in the vicinity of sample locations LSB-2, LSB-8, and RTP-02 along the Port Uplands Area shoreline, and in the vicinity of sample locations MW-1, SB-03, SB-10, SB-11, SS-10, PP-17, and PP-22 along the MJB North Area shoreline, could potentially designate as dangerous waste based on the toxicity characteristic and previously detected concentrations of lead, arsenic, chromium, and/or mercury. The "trigger value" for potential dangerous waste designation (i.e., 20 times the toxicity characteristic threshold) for arsenic and chromium is 100 mg/kg, and for mercury is 4 mg/kg. Based on previous TCLP lead testing at the Port Uplands and MJB North Areas, the trigger value for potential

[1] This is referred to as the "20-times rule" and is described in a September 21, 1992 EPA letter titled "Calculation of TCLP Concentrations from Total Concentrations". This reference is available at http://yosemite.epa.gov/osw/rcra.nsf/ea6e50dc6214725285256bf00063269d/95e9e57b91ea2e9f8525670f006c0acd!OpenDocument

dangerous waste designation based on the TCLP lead criterion will be 680 mg/kg (see Appendix A of the CAP; Ecology 2009). The determination as to whether soil excavated at these locations actually designates as dangerous waste will be based on representative sampling and analysis performed during the cleanup.

Soil excavated from locations with the potential for dangerous waste designation, as described above, will be managed in accordance with Washington State Dangerous Waste Regulations. This will include segregating the potential dangerous waste soil from other soil and temporarily stockpiling the soil on site. Representative samples of the stockpiled soil will be obtained and analyzed to determine waste designation. Soil that designates as dangerous waste will be treated on site as necessary to comply with Federal Universal Treatment Standards (UTS; Code of Federal Regulations [CFR] Title 40, Section 268.48) prior to transport and disposal at a Subtitle D facility. Sections 6.3, 7.3, and 9.3 of this report describe chemical characterization and waste designation procedures in greater detail.

5.2 PUGET SOUND DREDGED MATERIAL MANAGEMENT PROGRAM

The open-water disposal of sediments in Puget Sound is managed under the Puget Sound DMMP. This program is administered jointly by the USACE, the USEPA, the Washington Department of Natural Resources (WDNR), and Ecology. The DMMP developed the Puget Sound Dredge Disposal Analysis (PSDDA, 2000) protocols, which include testing requirements to determine whether dredged sediments are appropriate for open-water disposal. The DMMP has also designated disposal sites throughout Puget Sound. In accordance with the DMMP, a complete characterization of the dredged material would be required to obtain an open-water disposal suitability determination for the project. Use of open-water disposal facilities would need to comply with other DMMP requirements including material approval, disposal requirements, and payment of disposal site fees. Section 7.6.1 of this report describes dredged material disposal plans in greater detail.

5.3 STATE ENVIRONMENTAL POLICY ACT

The State Environmental Policy Act (SEPA) (Revised Code of Washington [RCW] 43.21C; WAC 197-11) and the SEPA procedures (WAC 173-802) are intended to ensure that State and local government officials consider environmental values when making decisions. The Port completed a SEPA checklist and furnished a copy to Ecology on January 28, 2009 (Port, 2009b). Because the cleanup action is being performed under a Consent Decree, SEPA and MTCA requirements are being coordinated. The Port is the lead SEPA agency for this cleanup action.

5.4 WASHINGTON SHORELINE MANAGEMENT ACT

The Washington Shoreline Management Act (RCW 90.58) and its implementing regulations establish requirements for substantial developments occurring within water areas of the state or within 200 feet of the shoreline. According to Shoreline Management Act regulations, local shoreline management plans and requirements are adopted under the State regulations, creating an enforceable State law. The Site cleanup action will comply with the City's substantive requirements, but a shoreline permit will not be required. The substantive requirements of the City's shoreline master program that are applicable to the project are set forth in the CAP (Ecology, 2009).

5.5 WASHINGTON HYDRAULIC CODE

The Washington Hydraulic Code (WAC 220-110) establishes regulations for the construction of any hydraulic project or the performance of any work that will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh water of the State. The code requires that a Hydraulic Project Approval

(HPA) permit (administered by the Washington Department of Fish and Wildlife) be obtained for any activity that could adversely affect fisheries and water resources. Although an HPA permit will not be required for the planned cleanup action, substantive timing restrictions and technical requirements under the code are applicable to planned dredging activities and placement of backfill and capping material. The HPA substantive requirements are detailed in Appendix G. The RI/FS and CAP were prepared using estimated costs and work durations that recognize potential fish closure periods, during which dredging and any in-water work will not be permitted (GeoEngineers et al., 2008). The Department of Fish and Wildlife has specified that project work below the ordinary high water mark may not occur from January 15 through June 14 of any year for the protection of migrating juvenile salmonids and herring spawning beds (see Appendix G).

5.6 WATER QUALITY MANAGEMENT

The Clean Water Act (CWA) is the primary Federal law for protecting water quality from pollution. The CWA regulations provide requirements for the discharge of dredged or fill material to waters of the United States and are applicable to any in-water work. Section 404 of the CWA requires that permits be obtained from the USACE for discharges of dredged or fill material into waters of the United States. The Port submitted a Joint Aquatic Resources Permit Application (JARPA) to USACE for the Section 404 permit on February 17, 2009 (Port, 2009c) and is undergoing formal consultation to obtain the permit.

In addition to the Federal CWA, water quality is regulated by Ecology under the State Water Quality Act (RCW 90.48). Section 401 of the Federal CWA requires the State to certify that Federal permits are consistent with State water quality standards. State and Federal standards for marine waters specified in the Section 404 permit will apply to discharges to surface water during sediment dredging, and to return flows (if necessary) to surface water from dewatering operations. Ecology water quality requirements for the project are detailed in Appendix F.

Construction activities that disturb 1 acre or more of land need to comply with the provisions of State construction stormwater regulations. Accordingly, an Ecology Construction Stormwater General Permit is required for the cleanup action, to include a stormwater pollution prevention plan or equivalent MTCA construction quality assurance project plan. A copy of the Construction Stormwater General Permit for the project is contained in Appendix H. Sections 6.1.6.3, 7.1.7.3, 7.1.7.5, 9.1.6, and 11.1.2.2 of this report describe water quality control measures to be implemented during the cleanup action, including stormwater management procedures.

5.7 ARCHAEOLOGICAL AND HISTORICAL PRESERVATION

The National Historic Preservation Act (Section 106) and the Federal Archaeological and Historical Preservation Act (16 USCA 496a-1) will be applicable if any materials of archaeological interest are discovered during site grading, excavation, or dredging activities. A cultural resources assessment was prepared for the Site to evaluate whether cleanup activities could affect cultural artifacts or archaeological remains that might be present in the subsurface (HRA, 2009). This assessment was included in the USACE permit application and is provided in Appendix D of this report for reference. In addition, an archaeological monitoring plan is provided in Appendix E. Sections 6.1.10, 7.1.12, and 9.1.9 of this report describe archaeological and historical preservation plans in greater detail.

The cultural resources assessment concludes that there is potential for archaeological remains to be found at the Site. If present, archaeological remains would most likely occur directly above or within the top portion of native glacial deposits or marine sediments, between about 7 to 10 feet bgs in the western part of the uplands area, and at about 15 feet bgs in the eastern part of the uplands area. Soil excavation performed in areas with the potential for archaeological remains will be monitored and managed in accordance with the archaeological monitoring plan in Appendix E.

5.8 OTHER APPLICABLE REGULATORY REQUIREMENTS

The following is a list of other applicable regulatory requirements for the cleanup action:

- Air Emissions – Applicable for site grading or excavation work that could generate airborne dust. Controls will be implemented during construction (e.g., wetting or covering exposed soils and stockpiles), as necessary, to meet Northwest Clean Air Agency substantive restrictions on off-site transport of airborne particulates. Sections 6.1.6.4, 7.1.7.4, 8.1.2.4, 9.1.6, and 11.1.2.1 of this report describe air emissions controls in greater detail.
- City Noise Ordinance Requirements – Construction activities will be carried out in a manner consistent with the City of Anacortes Municipal Code and State environmental noise standards (WAC 173-60).
- Health and Safety – Cleanup-related construction activities will be performed in accordance with the requirements of the Washington Industrial Safety and Health Act (RCW 49.17) and the Federal Occupational Safety and Health Act (29 CFR 1910, 1926). The associated regulations include requirements that workers are to be protected from exposure to harmful concentrations of contaminants and that excavations are to be properly shored. Section 15.0 and Appendix B of this report describe health and safety measures in greater detail.
- Minimum Standards for Construction and Maintenance of Wells – Groundwater monitoring wells in remedial excavation areas will be decommissioned prior to excavating soil. In addition, monitoring wells will be installed as part of the post-construction confirmational monitoring plan (see Section 11.3.2). Existing monitoring wells within the remedial excavation areas will be decommissioned, and any new monitoring wells will be constructed, in accordance with the requirements of WAC 173-160.

City of Anacortes building and construction permits, including demolition, grading, and drainage approvals, are not required because of the MTCA permit exemption; however, the substantive requirements of the permits must be met. The Port has provided project drawings to the City of Anacortes Building Department and will coordinate completion of the project work as it relates to required inspections, utility fees, etc.

6.0 PHASE 1 CLEANUP ACTION

This section describes the design elements of the Phase 1 cleanup action.

6.1 SITE PREPARATION

Phase 1 will include remedial excavation in four areas of the Port Uplands Area. The estimated maximum quantities of soil to be excavated in each area (including both overburden and underlying contaminated soil) are as follows:

- Remedial Excavation Area 1: 2,053 cy
- Remedial Excavation Area 2: 19 cy
- Remedial Excavation Area 3: 921 cy
- Remedial Excavation Area 4: 2,523 cy

The actual quantities of soil excavated in each area may be greater or less than these estimates based on the results of verification sampling at the excavation limits (see Sections 6.2.4 and 11.2.2).

The Phase 1 work area will be established by the contractor to minimize impacts to tenants in the project area and to maintain vehicle and pedestrian access in accordance with constraints described in the project contract documents for Phase 1 (Port, 2009d). Construction phasing and traffic control plans for work in the remedial excavation areas are detailed in the project contract documents and depicted in Phase 1 Sheets G1.3 and G1.4.

6.1.1 Construction Staging Area

The northeastern portion of Port Parcel 1 and a Port-owned property located across Q Avenue from the Site will be made available to the contractor. The staging area is expected to be used by the contractor for placement of construction trailers, contractor vehicle parking, and storage of supplies.

6.1.2 Soil Stockpiling Areas

Excavated soil will be stockpiled in the vicinity of the remedial excavation areas. Stockpile containment areas will be constructed in a manner to prevent environmental releases resulting from soil and water losses from the stockpiled material. The stockpile containments will be constructed of Ecology blocks and lined with an impermeable barrier as shown in Phase 1 Sheet C3.5. Stockpiled soil will be covered and secured from wind, rain, and other disturbances as appropriate to control erosion and dust.

Three types of soil stockpiles may be generated during Phase 1:

- Soil assumed to comply with cleanup levels and be suitable for reuse on site as backfill (will be sampled to confirm compliance with cleanup levels).
- Soil that has unknown concentrations of contaminants (will be sampled to confirm compliance with cleanup levels).
- Soil/wood debris to be transported off site for disposal (i.e., exceeding soil cleanup levels and/or unsuitable for reuse). It is assumed that this material will not need to be stockpiled and can be loaded directly into trucks for off-site disposal.

Some of the Phase 1 soil and wood debris may be excavated wet, in which case the excavated soil will be dewatered in a stockpile (or possibly mixed with other, drier soil) prior to off-site disposal. Excess water from the stockpiling areas will be removed and temporarily stored on site in portable tanks, and the water will be sampled to determine disposal requirements, as necessary. Wastewater will most likely be discharged to the local publicly owned treatment works (POTW) after confirming that it meets City of Anacortes discharge limits.

Soil stockpiling procedures for the Phase 1 cleanup action are described in greater detail in Sections 6.2.2 and 6.3.1.

6.1.3 Excavation Water Detention Areas

Groundwater may be encountered in some of the remedial excavations, in which case dewatering of the excavations may be required to maintain side slopes. Water collected during excavation dewatering will be temporarily stored on site in portable tanks and sampled as necessary to determine disposal requirements. Wastewater will most likely be discharged to the local POTW. If necessary, the water will be treated by settling and filtration prior to discharge to comply with City of Anacortes requirements. The excavation water detention (tank staging) area(s) will be located in the general vicinity of the remedial excavation areas.

6.1.4 Haul Road

A temporary haul road will be constructed for trucks and other construction-related traffic entering and leaving the project site. The haul road will extend eastward from the intersection of 17th Street and Q Avenue and will be constructed of crushed rock, gravel, and/or quarry spalls. Phase 1 Sheets G1.1 and C3.0 show the planned alignment of the haul road. The haul road will be primarily used by vehicles involved in the cleanup action.

6.1.5 Hours of Operation

Work associated with the cleanup action will be performed during hours allowed by City of Anacortes municipal code. City of Anacortes allowable work hours are 7:00 a.m. to 10:00 p.m. Exceptions to the allowable work hours may be made for utility connections in order to minimize tenant and property owner impacts. A variance will be required for work outside of the allowable hours. Variance on the allowable work hours will be coordinated with the City of Anacortes.

6.1.6 Temporary Site Controls

Temporary site controls will include site access control, traffic control, erosion control/stormwater pollution prevention, and dust and noise control.

6.1.6.1 Site Access Control

Site access will be controlled in general accordance with construction phasing and traffic control plans included in the project contract documents (see Phase 1 Sheets G1.3 and G1.4). Prior to the start of Phase 1 work, the Port will install temporary fencing to limit access to the Site. The contractor will be responsible for providing and installing all other fencing, barricades, signage, and other traffic control devices necessary for cordoning off the work site.

Vehicles will enter and leave the site via the construction haul road (described in Section 6.1.4). Seafarers' Way serves the existing commercial uses on the property as well as the planned Marine Skills Center building and parking area on Port Parcel 1. The haul road will provide the primary route for project-related vehicles. Trucks will be staged along the haul road while waiting for loading. A wheel wash will be positioned near the exit of the haul road to remove soil that might otherwise be tracked off site.

Temporary fencing, barricades, and traffic control flaggers will be used to control access to construction work areas. The fencing and other traffic control measures will remain in place for the duration of the project.

6.1.6.2 Traffic Control

Traffic control will be performed in general accordance with the construction phasing and traffic control plans contained in the project contract documents (see Phase 1 Sheets G1.3 and G1.4). Lane closure signs, traffic barricades, and traffic control flaggers will be utilized as necessary to maintain safe working conditions around the active work areas. Traffic controls will remain in place for the duration of the project.

Excavated materials and clean backfill will be transported to and from the Site in trucks. It is expected that the Phase 1 cleanup may generate a peak number of truck trips of the order of 10 per day. The number of truck trips will, however, vary depending on the daily activity.

Pedestrian access around or adjacent to work areas will not be restricted except during ongoing construction activities. When construction activities require closure of a pedestrian sidewalk or walkway, alternate pedestrian routing will be established.

6.1.6.3 Erosion Control/Stormwater Pollution Prevention

Best management practices (BMPs) will be used to control erosion during excavation and backfilling activities. BMPs will be implemented consistent with the State Department of Ecology Stormwater Management Manual for Western Washington and the Construction Stormwater General Permit for the project. A stormwater pollution prevention plan will be prepared as appropriate by the contractor. Erosion control procedures are detailed in the project contract documents and depicted in Phase 1 Sheets G1.7A and G1.8. Proposed project elements designed to prevent stormwater pollution include:

- Erosion of exposed soil will be controlled.
- Materials that could contribute pollutants to stormwater will be contained.
- Stockpiled soil will be covered and secured from wind, rain, and other disturbances as appropriate to control erosion and dust.
- Soil and silt will be prevented from entering storm drains through the use of silt fencing, silt dikes, storm drain inlet protection, catch basin silt barriers, fabric filter fences, straw bales, interceptor swales, wattle and rock check dams, and/or similar BMPs.
- A truck wheel wash will be installed in the westbound lane of the haul road so that trucks leaving the site will not track soil off site.

6.1.6.4 Dust and Noise Control

Site grading and excavation work could generate airborne dust. Engineering controls will be used during construction (e.g., wetting or covering exposed soil and stockpiles), as necessary, to meet Northwest Clean Air Agency substantive restrictions on off-site transport of airborne particulates. In addition, street sweeping will be performed continuously in areas where construction traffic mixes with general vehicular traffic.

Construction noise will be generated by a variety of construction equipment, including truck engines, generators and other small engines, and earthmoving equipment. Construction noise will be limited to daytime hours and is not expected to create adverse impacts due to the lack of sensitive noise receptors in the area. Construction activities will be carried out in a manner consistent with City of Anacortes municipal code and State environmental noise standards. The City of Anacortes allowable work hours are 7:00 a.m. to 10:00 p.m. A variance will be required for work outside of these hours. Noise monitoring will be conducted if required by the City.

6.1.7 Utility Protection/Relocation

Site utilities will be located prior to any excavation activities. A reasonable attempt was made to locate utilities during remedial design; however, the exact location or depth of utilities is unknown in certain instances. The contractor will be responsible for field-locating existing utilities using methods such as potholing prior to beginning excavation work.

Known site utilities include electricity, natural gas, telephone, television cable, water, sanitary sewer, and storm drains. Electrical and water utilities, including a City water main, several fire hydrants, and below- and aboveground power lines, may be encountered during excavation. Storm drains will also likely be encountered.

Utilities in the vicinity of the remedial excavation areas will be decommissioned and/or temporarily disconnected and rerouted as necessary prior to and during excavation activities. Utilities will be rerouted and/or restored during and after completion of backfilling and grading.

6.1.8 Monitoring Well Abandonment

Monitoring well MW-102 is located within Remedial Excavation Area 2. This well will be abandoned by a Washington-licensed driller in accordance with Ecology requirements (WAC 173-160-460) prior to any soil excavation in this area.

6.1.9 Excavation Shoring/Foundation Protection

Where a sloped excavation infringes on, or potentially endangers or compromises an existing site facility or feature, the contractor will provide shoring, sheeting, and/or bracing as required to perform the earthwork. Excavation slopes and shoring, where necessary, will comply with Washington State construction safety standards for excavation, trenching, and shoring (WAC 296-155, Part N). The contractor will select and design the means, methods, and sequencing of shoring for the Phase 1 excavations. As-builts for any permanent shoring/foundation protection will be included in the final construction completion report.

6.1.10 Cultural/Archaeological Preservation

A cultural resources assessment was completed for the Site in January 2009 to evaluate whether cleanup activities could potentially encounter cultural artifacts or archaeological remains that might be present in the subsurface (HRA, 2009a; Appendix D). Based on the results of the cultural resources assessment, an archaeological monitoring plan was prepared for excavation activities that have the potential to encounter cultural artifacts or archaeological remains (HRA, 2009b; Appendix E). These include:

- Excavation activities conducted west of R Avenue that extend deeper than 5 feet bgs (i.e., below historical fill). This includes portions of Excavation Areas 1 and 3.
- Excavation activities conducted at any location that extend deeper than 13 feet bgs (i.e., below historical fill). This includes a portion of Remedial Excavation Area 4 where a new sanitary sewer lift station will be installed.
- Excavation activities conducted south of R Avenue that extend deeper than 3 feet bgs (i.e., below historical fill). This includes the excavation necessary to install the wheel wash system along the haul road.

Excavation activities at these areas and depths will be monitored by a qualified archaeological resources specialist. The archaeological monitoring plan (Appendix E) establishes procedures to follow if cultural artifacts or archaeological remains are encountered. The archaeological monitoring plan was approved by the USACE on May 18, 2009 (USACE, 2009).

6.2 SOIL EXCAVATION

This section describes planned soil excavation activities, including the excavation approach and methods, soil segregation and stockpiling, construction dewatering, verification sampling, and backfilling and compaction.

6.2.1 Excavation Approach and Methods

Contaminated soil will be excavated at four areas within the Port Uplands Area as shown in Phase 1 Sheets G1.1 and C3.0 and Sheets C3.1 to C3.4. Soil excavation will be performed using commonly available excavation methods. Excavation procedures will include the following:

- At each remedial excavation area, soil excavation will be initiated at the designated locations shown in Phase 1 Sheets C3.1 to C3.4 and move radially away from these areas until clean sidewalls are achieved. Excavation will be performed using standard earthmoving equipment.
- Overburden soil will be excavated as needed to gain access to underlying contaminated soil. The excavations will be completed in a manner that allows segregation and reuse of clean overburden soil as described in Section 6.2.2.
- Field screening (headspace organic vapor screening, water sheen screening, and visual observation) will be performed by a geologist, environmental scientist, or engineer as soil excavation proceeds, to help determine when to collect verification samples. The preliminary limits of excavation will be determined by the results of field screening. Once the preliminary limits are reached, verification soil samples will be collected for laboratory analysis from the excavation sidewalls and base as discussed in Sections 6.2.4 and 11.2.
- If the initial verification samples collected from the excavation base indicate that further vertical excavation is necessary to achieve soil cleanup levels, additional excavation will be performed until the compliance excavation depths are reached (6 feet bgs at Remedial Excavation Areas 1, 2, and 4), or until subsequent verification samples obtained from the excavation base indicate that complete removal of contamination has been achieved (Remedial Excavation Area 3). The maximum excavation depth at Remedial Excavation Area 3 will be dictated by clean verification samples because, unlike Areas 1, 2, and 4, existing data for Area 3 suggest that complete removal of contamination at this location can likely be achieved by extending the excavation to a depth no greater than 10 feet bgs.
- If the initial verification samples collected from the excavation sidewalls indicate that further lateral excavation is necessary to achieve soil cleanup levels, additional excavation will be performed until subsequent verification samples obtained from the excavation sidewalls indicate that clean limits have been achieved.
- Excavations extending below the water table will be completed using commonly available dewatering techniques to minimize the water content of the excavated materials to the extent possible.

6.2.2 Soil Segregation and Stockpiling

Segregation and stockpiling of excavated soil will be conducted on site and as close as practicable to the remedial excavation areas. Soil will be segregated for stockpiling as follows:

- Shallow overburden soil expected to not exceed cleanup levels, and which is deemed geotechnically suitable for reuse on site as backfill, will be temporarily stockpiled and sampled to confirm that contaminant concentrations are below the soil cleanup levels listed in Table 1. Details regarding stockpile sampling for chemical characterization are discussed in Section 6.3.

- Deeper overburden soil expected to potentially exceed cleanup levels, and which is deemed suitable for reuse on site as backfill, will be temporarily stockpiled separately from the shallow overburden soil and sampled to assess contaminant concentrations relative to soil cleanup levels. Following stockpile sampling and chemical characterization as described in Section 6.3, this soil will used for backfill or disposed of, as appropriate.
- Soil known to contain contaminant concentrations exceeding cleanup levels based on previous sampling data will be loaded directly into trucks from the remedial excavations and transported off site for disposal at a permitted facility.

As depicted in Phase 1 Sheets C3.3 and C3.4, segregation of excavated soils will be based primarily on the depth of the soils relative to the original (pre-excavation) ground surface. Elevation (depth) control during excavation will be achieved using standard land survey equipment. Stockpiled soil will be covered and secured from wind, rain, and other disturbances as appropriate to control erosion and dust. Section 6.1.2 provides additional details regarding soil stockpiling procedures.

6.2.3 Construction Dewatering and Wastewater Characterization

Construction dewatering may be required for excavations that extend below the water table to facilitate soil removal and reduce the water content of excavated soil to the extent possible, and to enable verification sampling. Groundwater conditions at the Site suggest that soil excavations extending below approximately 10 feet bgs may encounter groundwater.

If construction dewatering is necessary, it will be accomplished using a contractor-designed system to allow excavation to proceed in conditions that allow for stable side slopes and collection of verification samples. Authorization for discharge of water from dewatering operations to the sanitary sewer will be needed from the City of Anacortes. The Port will request authorization and will obtain required approvals from the City of Anacortes for discharge of dewatering effluent to the local POTW, if necessary. If necessary, excavation water will be treated prior to discharge. Additionally, samples of wastewater discharged to the POTW will be collected and analyzed as necessary to confirm that the water complies with the City's discharge criteria. Wastewater samples will be analyzed for constituents required by the City, which may include aromatic volatile organic compounds, gasoline-, diesel-, and heavy oil-range petroleum hydrocarbons, lead, pH, total settleable solids, and/or sodium.

The contractor will be responsible for disposal of collected water in soil stockpiling areas. Water that drains from the stockpiles will likely be discharged to the local POTW as described above. This water will be treated and/or sampled as necessary to comply with City of Anacortes POTW discharge requirements or alternate disposal facility requirements.

6.2.4 Verification Sampling

Verification sampling will involve collecting soil samples from the base and sidewalls of the remedial excavations to verify that cleanup levels have been achieved and/or to document concentrations of contaminants remaining at the Site. Verification sampling will consist of the following steps:

- Discrete grab samples will be obtained from the limits of the excavations at the sampling density described in Section 11.2.

- The verification soil samples will be analyzed on a short turnaround basis to assess compliance with site-specific cleanup levels (Table 1) and minimize contractor standby time.
- At Remedial Excavation Areas 1, 2, and 4, the base of the excavation will be dictated by the design excavation depth of 6 feet bgs rather than attainment of cleanup levels. In these areas, the excavation base samples will be used to document contaminant concentrations remaining at the Site after soil removal actions are completed.

Verification samples for the Phase 1 cleanup action will be analyzed for arsenic, copper, lead, zinc, and/or cPAHs depending on the remedial excavation area. Further details regarding verification sampling are provided in Section 11.2.

6.2.5 Backfilling and Compaction

The contractor will survey the excavation limits prior to any backfilling for the purpose of developing as-built drawings and to compute pay volumes. The contractor will also survey the backfilled limits of excavation areas following placement of any stockpiled overburden soil that is reused as backfill, for the purpose of reporting.

Remedial excavations will be backfilled and compacted to surface grade with clean and suitable materials. A geotextile fabric will be placed at the base of the excavation as an environmental marker if the excavation does not achieve complete removal of contaminated soil (as indicated based on existing data or verification sample results). Stockpiled overburden soil with suitable physical and chemical characteristics will be reused as backfill to the extent possible, and will be supplemented with clean imported fill materials from a known source. Reuse of overburden soil will be dependent on the results of chemical characterization sampling as described in Section 6.3.1.2. In addition, the contractor will provide the Port with verification that all imported granular fill materials have been tested and certified to be free of contaminants at concentrations above the soil cleanup levels listed in Table 1. The source for the fill material will be documented in the construction completion report for the project.

6.3 Chemical Characterization of Excavated Soil for Disposal or Reuse

Excavated soil will be characterized for disposal or on-site reuse as required by MTCA and Washington State Dangerous Waste regulations and the selected disposal facility. Where possible, existing soil analytical data will be used to characterize contaminated soil for disposal. This approach will allow excavated contaminated soil to be transported directly to the disposal facility without further characterization. Based on the existing data and preliminary discussions with regional disposal facilities, it is expected that additional sampling of contaminated soil for waste designation or profiling purposes will not be required during Phase 1.

6.3.1 Stockpile Characterization Sampling

Where stockpile characterization sampling is necessary, stockpile sampling will be performed at a frequency consistent with Table 1 of Ecology's *Guidance for Remediation of Petroleum Contaminated Soils* (Ecology, 1995), as follows:

Cubic Yards of Soil	Minimum Number of Samples
0-100	3
101-500	5

501-1000	7
1001-2000	10
>2000	10 + 1 for each additional 500 cubic yards

Discrete grab samples will be collected from various zones and/or depth horizons within the stockpiles as the stockpiles are being constructed to obtain spatially representative samples of the stockpiled material. The stockpile samples will be collected from locations that are generally representative of the soils and where field screening indicates contamination may be present. If field screening does not indicate potential contamination, the stockpile will be divided into sections and each section will be sampled. To evaluate whether stockpiled overburden soil can be reused on site as backfill, the stockpile samples will be analyzed for the Site indicator hazardous substances (see Tables 1 and 4) and the results will be compared to the cleanup levels listed in Table 1.

6.3.2 Dangerous Waste Evaluation

Excavated soil determined to exceed site-specific soil cleanup levels will fall into one of two categories: 1) non-dangerous waste suitable for disposal at a Subtitle D facility; or 2) Washington-defined dangerous waste requiring either disposal at a Subtitle C (hazardous/dangerous waste) facility, or treatment followed by disposal at a Subtitle D facility. Based on an evaluation of existing soil analytical data, none of the known contaminated soil to be excavated during the Phase 1 cleanup action is expected to be designated as a dangerous waste on the basis of the dangerous waste characteristics and criteria defined in WAC 173-303. Furthermore, there is no indication of listed wastes being generated or disposed of at the Site. Consequently, it is not expected that contaminated soil excavated during the Phase 1 cleanup action will designate as a Washington-defined dangerous waste.

Before any stockpiled soil is transported off site for disposal, chemical characterization data for this soil will be reviewed to evaluate potential dangerous or non-dangerous waste status, and follow-up TCLP analyses will be performed to confirm waste designation as appropriate. Prior to transporting contaminated soil to a Subtitle D facility, analytical data representative of the soil will be evaluated to ensure compliance with Federal Land Disposal Restrictions criteria (i.e., the UTS criteria) defined in 40 CFR 268.48.

6.4 SITE RESTORATION

This section outlines the planned restoration of upland areas following soil excavation and backfilling activities. Site restoration plans are detailed in the project contract documents, and are depicted in Phase 1 Sheets C3.6A to C3.8A and Sheets L1.0 to L1.4.

6.4.1 Utilities

During the Phase 1 cleanup action, existing utilities will be restored and/or replaced, and new utilities will be installed, as follows:

- A new sanitary sewer lift station and associated components will be installed in Remedial Excavation Area 4.

- New utilities will be installed west of Remedial Excavation Area 4 and north along R Avenue up to the intersection with Seafarer's Way.
- Stormwater conveyance under R Avenue within the Phase 1 work areas will be maintained during construction activities. Existing stormwater retention and conveyance features in the vicinity of Remedial Excavation Area 1 will be restored to original condition, including the stormwater retention ditch on the west and east sides of R Avenue, and all piping.
- Existing utilities that are rendered obsolete by the installation of new utilities will be removed to the extent practicable.

6.4.2 Surface Restoration

Upland ground surfaces affected by the Phase 1 cleanup activities will be restored/finished with clean imported fill, recycled clean fill (overburden soil) from remedial excavations, crushed rock surfacing, and/or pavement as appropriate.

Any roadways or sidewalks removed during cleanup activities will be restored to original condition. Disturbed surfaces will be restored in accordance with pavement and landscape restoration plans included in the project contract documents (Phase 1 Sheets C3.6A to C3.8A and L1.0 to L1.4).

7.0 PHASE 2 CLEANUP ACTION

This section describes the design elements of the Phase 2 cleanup action.

7.1 SITE PREPARATION

Phase 2 will include excavation of soil in nine areas of the Port Uplands Area and the Marine Area 75-foot shoreline buffer zone (Remedial Excavation Areas 5 to 13), and dredging of sediment and debris from the beach/intertidal and subtidal portions of the Marine Area. The estimated quantities of soil and dredged material to be removed in each area (including both overburden and underlying contaminated soil/sediment) are as follows:

- Remedial Excavation Area 5: 19,555 cy
- Remedial Excavation Area 6: 759 cy
- Remedial Excavation Area 7: 171 cy
- Remedial Excavation Area 8: 1,676 cy
- Remedial Excavation Area 9: 4,492 cy
- Remedial Excavation Area 10: 2,351 cy
- Remedial Excavation Area 11: 5,962 cy
- Remedial Excavation Area 12: 1,976 cy
- Remedial Excavation Area 13: 70 cy
- Cap Area Dredging: 18,500 cy
- Backfill Area Dredging: 26,300 cy

The actual quantities of soil or dredged material removed from each area may be greater or less than these estimates based on the results of verification sampling at the excavation limits and/or conditions encountered in the field (see Sections 6.2.4 and 11.2.2).

The Phase 2 work areas will be established by the contractor to minimize impacts to tenants in the project area and to maintain vehicle and pedestrian access in accordance with constraints described in the project contract documents for Phase 2 (Port, 2009e). Construction phasing and traffic control plans for work in each remedial excavation and dredging area are detailed in the project contract documents and depicted in Phase 2 Sheets G1.4 and G1.5.

7.1.1 Construction Staging Area

A Port-owned property located across Q Avenue from the Site will be made available to the contractor as a staging area. The staging area will be used by the contractor for placement of construction trailers, contractor vehicle parking, and storage of supplies. Other designated contractor staging areas will be located on Site.

7.1.2 Soil Stockpiling Areas

Excavated soil will be stockpiled in the vicinity of the remedial excavation areas. Stockpile containment areas will be constructed in a manner to prevent environmental releases resulting from soil and water losses from the stockpiled material. The stockpile containments will be constructed of ecology blocks and lined with an impermeable barrier as shown in Phase 2 Sheet C1.12. Stockpiled soil will be covered and secured from wind, rain, and other disturbances as appropriate to control erosion and dust.

Four types of soil stockpiles may be generated during Phase 2:

- Soil assumed to comply with cleanup levels and be suitable for reuse on site as backfill (will be sampled to confirm compliance with cleanup levels).
- Soil that has unknown concentrations of contaminants and may be reused on site as backfill or disposed of, depending on the outcome of stockpile sampling and analysis.
- Soil and debris to be transported directly off site for disposal (i.e., exceeding soil cleanup levels and/or unsuitable for reuse). It is assumed that this material (with the exception of material identified as potential dangerous waste – see below) will not need to be stockpiled and can be loaded directly into trucks for off-site disposal.
- Soil and debris identified as potential dangerous waste based on existing data. This material will be sampled for waste designation purposes and appropriately managed based on the sampling results (i.e., either transported directly to an off-site Subtitle D facility, or first treated on site to comply with Federal UTS criteria and then transported to a Subtitle D facility). The remedial excavation areas that have been identified as containing potential dangerous waste are discussed further in Section 7.3.2.

Some of the Phase 2 soil and debris may be excavated wet, in which case the excavated soil will be dewatered in a stockpile (or possibly mixed with other, drier soil) prior to off-site disposal. Excess water from the stockpiling areas will be collected and temporarily stored on site in portable tanks, and the water will be sampled to determine disposal requirements, as necessary. Wastewater that meets City of Anacortes discharge limits will most likely be discharged to the local POTW.

Soil stockpiling procedures for the Phase 2 cleanup action are described in greater detail in Sections 7.2.2 and 7.3.1.

7.1.3 Pier 2 Dredged Material Handling Area

Sediment, wood waste, and debris removed from intertidal and subtidal areas will be transported by truck or barge to the Port's temporary material storage and handling facility at Pier 2 for dewatering and separation into like waste streams. Material will be self-contained during handling. Water that drains from the dredged material will be collected using a network of catch basins, treated, and discharged to the POTW. The Port has obtained an Ecology Solid Waste Permit (for construction and operation of solid waste piles in accordance with WAC 173-350-320) for the planned Pier 2 operations.

7.1.4 Excavation Water Detention Areas

Groundwater may be encountered in some of the remedial excavations, in which case dewatering of the excavations may be required to maintain side slopes and to collect verification samples. Water collected during excavation dewatering will be temporarily stored on site in portable tanks and sampled as necessary to determine disposal requirements. Wastewater will most likely be discharged to the local POTW. If necessary, the water will be treated by settling and filtration prior to discharge to comply with City of Anacortes requirements. The excavation water detention (tank staging) area(s) will be located in the general vicinity of the remedial excavation areas.

7.1.5 Haul Routes

The haul road constructed during Phase 1 will be used for overland transport of soil and sediment in trucks and for other construction-related traffic entering and leaving the project site.

Barges carrying dredged material from the Marine Area will travel north around Cap Sante, then west in Guemes Channel to Pier 2. The haul route for overwater transport of sediment dredge backfill from the Swinomish Channel Dredge Site to the Scott Mill Site is shown in Phase 2 Sheet C2.11. Should the open-water disposal option be available, barges would be hauled to Port Gardner near Everett, Washington.

7.1.6 Hours of Operation

Work associated with the cleanup action will be performed during hours allowed by City of Anacortes municipal code. City of Anacortes allowable work hours are 7:00 a.m. to 10:00 p.m. Exceptions to the allowable work hours may be made for utility connections in order to minimize tenant and property owner impacts and to allow for favorable tide conditions to complete the work. A variance will be required for work outside of the allowable hours. Variance on the allowable work hours will be coordinated with the City of Anacortes.

7.1.7 Temporary Site Controls

Temporary site controls will include site access control, traffic control, erosion control/stormwater pollution prevention, dust and noise control, and surface water quality control.

7.1.7.1 Site Access Control

Site access will be controlled in general accordance with the construction phasing and traffic control plans included in the project contract documents (see Phase 2 Sheets G1.4 and G1.5) and described in Section 6.1.6.1.

7.1.7.2 Traffic Control

Traffic will be controlled in general accordance with the construction phasing and traffic control plans included in the project contract documents (see Phase 2 Sheets G1.4 and G1.5) and described in Section 6.1.6.2.

Excavated materials and clean backfill will be transported to and from the Site in trucks. It is expected that the Phase 2 cleanup may generate a peak number of truck trips of the order of 30 per day. The number of truck trips will, however, vary depending on the daily activity.

7.1.7.3 Erosion Control/Stormwater Pollution Prevention

BMPs will be used to control erosion during excavation and backfilling activities. BMPs will be implemented consistent with the Department of Ecology Stormwater Management Manual for Western Washington and the Construction Stormwater General Permit for the project. A stormwater pollution prevention plan will be prepared as appropriate by the contractor. Erosion control procedures are detailed in the project contract documents and depicted in Phase 2 Sheets G1.6 and G1.7. Proposed project elements designed to prevent stormwater pollution include:

- Erosion of exposed soil will be controlled.
- Materials that could contribute pollutants to stormwater will be contained.
- Stockpiled soil will be covered and secured from wind, rain, and other disturbances as appropriate to control erosion and dust.
- Soil and silt will be prevented from entering storm drains through the use of silt fencing, silt dikes, storm drain inlet protection, catch basin silt barriers, fabric filter fences, straw bales, interceptor swales, wattle and rock check dams, and/or similar BMPs.
- A truck wheel wash will be installed in the westbound lane of the haul road so that trucks leaving the site will not track soil off site.
- A floating debris boom will be utilized to contain silt and floating debris in the offshore area of the Site (see Section 7.1.7.5).

7.1.7.4 Dust and Noise Control

Site grading and excavation work could generate airborne dust. Engineering controls will be used during construction (e.g., wetting or covering exposed soil and stockpiles), as necessary, to meet Northwest Clean Air Agency substantive restrictions on off-site transport of airborne particulates. In addition, street sweeping will be performed continuously in areas where construction traffic mixes with general vehicular traffic.

Construction noise will be generated by a variety of construction equipment, including truck and crane engines, generators and other small engines, dredges, and earthmoving equipment. Construction noise will be limited to daytime hours and is not expected to create adverse impacts due to the lack of sensitive noise receptors in the vicinity of the work areas. Construction activities will be carried out in a manner consistent with City of Anacortes municipal code and State environmental noise standards. Noise monitoring will be conducted if required by the City.

Materials sorting at Pier 2 will primarily be done inside of a covered area to contain dust and reduce light and noise impacts.

7.1.7.5 Surface Water Quality Control

Potential discharges to surface water during Phase 2 include localized temporary increases in turbidity during dredging and excavation, and leakage of petroleum products (e.g., fuels, oil, grease, hydraulic fluids) from equipment. These substances could enter surface water directly (from vessels or barge-mounted equipment involved in construction), or in stormwater runoff from upland areas. Turbidity is expected to increase temporarily due to short-term suspension of sediments in the water column at the point of dredging. Any turbidity associated with dredging will be localized and temporary, and will be limited to the mixing zone allowed by Ecology's water quality requirements as detailed in Appendix F.

BMPs will be used to control erosion and water quality impacts during dredging and backfill activities. BMPs will be implemented for dredging, transporting sediment, rock, and other materials by barge, transferring material from barge to upland areas, construction of dredged material stockpiles, transferring rock from upland areas to barge, and construction of wave attenuation structures. BMPs that may be used include: using a clamshell-type dredge bucket and ensuring complete closure of the bucket before raising it from the sediment surface and complete lowering of the bucket before releasing rock; using silt and debris control booms during dredging operations; performing periodic monitoring of water column turbidity; and minimizing barge propeller wash to avoid disturbing the sediment surface. The BMPs will be described in a pollution prevention plan or water quality control plan that will be part of the contractor's Construction Quality Control Plan. The contractor will adhere to Washington State water quality standards that limit the impact of turbidity.

The Pier 2 handling facility is self-contained and will be covered. Runoff water from within the handling area will be collected and treated prior to discharge to the POTW.

7.1.8 Utility Protection/Relocation

Site utilities will be located prior to any excavation activities. A reasonable attempt was made to locate utilities during remedial design; however, the exact location or depth of utilities is unknown in certain instances. The contractor will be responsible for field-locating existing utilities using methods such as potholing prior to beginning excavation work.

Known site utilities include: electricity, natural gas, telephone, television cable, water, sanitary sewer, storm drains, and a sheet pile wall cathodic protection system. Site utilities expected to be encountered during excavation include electricity, natural gas, telephone, water, sanitary sewer, and the sheet pile wall cathodic protection system. Storm drains, catch basins, and associated outfalls will also likely be encountered.

Utilities in the vicinity of the remedial excavation areas will be decommissioned and/or temporarily disconnected and rerouted as necessary prior to and during excavation activities. Utilities will be rerouted and/or restored during and after completion of backfilling and grading.

7.1.9 Monitoring Well Abandonment

Six monitoring wells are located in Phase 2 remedial excavation areas. Wells MW-109 and MW-110 are located in Remedial Excavation Areas 5 and 6 and wells MW-106 and RMW-10 are located in Remedial Excavation Areas 8 and 10 on Port property. In addition, wells MW-1 and MW-5 are located in Remedial Excavation Areas 12 and 13 on MJB property. These wells will be abandoned by a Washington-licensed driller in accordance with Ecology requirements (WAC 173-160-460) prior to initiating soil excavation in these areas.

7.1.10 Excavation Shoring/Foundation Protection

Where a sloped excavation potentially endangers or compromises an existing site structure or feature, the contractor will provide shoring, sheeting, and/or bracing as required to perform the earthwork. Excavation slopes and shoring, where necessary, will comply with Washington State construction safety standards for excavation, trenching, and shoring (WAC 296-155, Part N). The contractor will select and design the means, methods, and sequencing of shoring for the Phase 2 excavations. As-builts for any permanent shoring/foundation protection will be included in the final construction completion report.

It is anticipated that shoring will be used to protect the following areas/items during Phase 2:

- Shoring will be used in Remedial Excavation Area 6 to protect existing equipment foundations.
- A shoring/cut-off wall at MHHW may be used in Remedial Excavation Areas 8, 9, 11, and 12, to allow excavation to MHHW if necessary, and to minimize infiltration of water into excavation.
- Shoring will be used in Remedial Excavation Area 10 to protect the foundation of the ESD/Northwest Educational Service building. This area will be excavated eastward up to the existing sheet pile wall along the shoreline.

To avoid demolishing or using shoring to protect the Park Building, the primary structure of the Park Building will be lifted off of the slab foundation and temporarily moved to the contractor staging area west of Q Avenue. The Park Building will be removed prior to initiating soil excavation in Remedial Excavation Areas 5 and 8. The building foundation will be left in place and will be addressed by the Phase 2 contractor, as necessary. Partial or complete demolition of the Park Building foundation and associated under-slab utilities may be necessary to achieve removal of contaminated soil exceeding cleanup levels beneath the building. Restoration of the building foundation and primary Park Building structure will be completed as part of, or following, the Phase 3 cleanup action.

7.1.11 Demolition

Demolition will occur as part of the Phase 2 cleanup action in both upland and marine areas.

7.1.11.1 Upland Areas

Demolition of asphalt and concrete pavement will be completed as needed. The concrete structures on the east side of the MJB North Area property also will be demolished if necessary to complete the remedial excavations in that area of the Site. Excavation work in Remedial Excavation Areas 5 and 8 could encounter buried concrete foundations for the Park Building that may require removal in order to achieve cleanup objectives.

7.1.11.2 Marine Area

The Phase 2 cleanup action will include removal or demolition of the following shoreline or marine facilities/structures:

- An existing esplanade will be demolished as necessary to complete the shoreline excavation work.
- An existing small craft launch facility adjacent to the shoreline, including a 200-foot-long dock/pier and approximately 10 steel piles, will be removed and salvaged.
- Approximately 600 exposed timber piles within the Marine Area will be removed or cut off at an elevation no higher than 3 feet below the final capped or backfilled surface.
- A 615-foot riprap revetment along the Port property shoreline will be removed.
- A 360-foot section of the riprap revetment located along the MJB property shoreline will be removed.

- The existing timber pile breakwater structure and rock base located in the southern part of the Cap Sante Boat Haven entrance will be removed after the wave attenuation structures are constructed.

7.1.12 Cultural/Archaeological Preservation

A cultural resources assessment was completed for the Site in January 2009 to evaluate whether cleanup activities could potentially encounter cultural artifacts or archaeological remains that might be present in the subsurface (HRA, 2009a; Appendix D). Based on the results of the cultural resources assessment, an archaeological monitoring plan was prepared for excavation activities that have the potential to encounter cultural artifacts or archaeological remains (HRA, 2009b; Appendix E). These include:

- Excavation activities conducted at any location that extend deeper than 13 feet bgs (i.e., below historical fill). This includes Remedial Excavation Area 5 on the Port Uplands Area.
- Excavation activities conducted south of R Avenue that extend deeper than 3 feet bgs (i.e., below historical fill). This includes Remedial Excavation Areas 11, 12, and 13 on the MJB North Area.

Excavation activities at these areas and depths will be monitored by a qualified archaeological resources specialist. The archaeological monitoring plan (Appendix E) establishes procedures to follow if cultural artifacts or archaeological remains are encountered. The archaeological monitoring plan was approved by the USACE on May 18, 2009 (USACE, 2009).

7.2 SOIL EXCAVATION

This section describes planned soil excavation activities, including the excavation approach and methods, soil segregation and stockpiling, construction dewatering, verification sampling, and backfilling and compaction.

7.2.1 Excavation Approach and Methods

Contaminated soil will be excavated in nine remedial excavation areas as shown in Phase 2 Sheets C1.0 and C1.1. Remedial Excavation Areas 5 to 7 are on Port property west of the Marine Area shoreline buffer zone, and Remedial Excavation Areas 8 to 13 are in the Marine Area shoreline buffer zone on Port and MJB properties. Soil excavation will be performed using commonly available excavation methods. Excavation procedures will include the following:

- At each remedial excavation area, soil excavation will be initiated at the designated locations shown in Phase 2 Sheets C1.2 to C1.5 and move radially away from these areas until clean sidewalls are achieved. Excavation will be performed using standard earthmoving equipment.
- Overburden soil will be excavated as needed to gain access to underlying contaminated soil. The excavations will be completed in a manner that allows segregation and reuse of clean overburden soil as described in Section 7.2.2.
- Field screening (headspace organic vapor screening, water sheen screening, and visual observation) will be performed by a geologist, environmental scientist, or engineer as soil excavation proceeds, to help determine when to collect verification samples. The preliminary limits of excavation will be determined by the results of field screening. Once the preliminary limits are reached, verification soil samples will be collected for laboratory analysis from the excavation sidewalls and base as discussed in Sections 7.2.4 and 11.2.

- If the initial verification samples collected from the excavation base indicate that further vertical excavation is necessary to achieve soil cleanup levels, additional excavation will be performed until the compliance excavation depths are reached (6 feet bgs at Remedial Excavation Areas 6 and 7, and 10 feet bgs at Remedial Excavation Areas 8 through 13), or until subsequent verification samples obtained from the excavation base indicate that complete removal of contamination has been achieved (Remedial Excavation Area 5). Unlike the other remedial excavation areas, the maximum excavation depth at Remedial Excavation Area 5 will be dictated by clean verification samples, due to the risk of potential future impacts to groundwater should petroleum contamination at this location not be completely removed.
- If the initial verification samples collected from the excavation sidewalls indicate that further lateral excavation is necessary to achieve soil cleanup levels, additional excavation will be performed until subsequent verification samples obtained from the excavation sidewalls indicate that clean limits have been achieved.
- Excavations extending below the water table will be completed using commonly available dewatering techniques to minimize the water content of the excavated materials to the extent possible. For Remedial Excavation Areas 9, 11, and 12, a shoring/cut-off wall at the MHHW may be used to allow excavation up to the MHHW if necessary, and to minimize infiltration of water into the excavation.

7.2.2 Soil Segregation and Stockpiling

Segregation and stockpiling of excavated soil will be conducted on site and as close as practicable to the remedial excavation areas. Soil will be segregated for stockpiling as follows:

- Shallow overburden soil expected to not exceed cleanup levels, and which is deemed geotechnically suitable for reuse on site as backfill, will be temporarily stockpiled and sampled to confirm that contaminant concentrations are below the soil cleanup levels listed in Table 1. Details regarding stockpile sampling for chemical characterization are discussed in Section 7.3.
- Deeper overburden soil expected to potentially exceed cleanup levels, and which is deemed suitable for reuse on site as backfill, will be temporarily stockpiled separately from the shallow overburden soil and sampled to assess contaminant concentrations relative to soil cleanup levels. Following stockpile sampling and chemical characterization as described in Section 7.3, this soil will used for backfill or disposed of, as appropriate.
- Soil and debris known to contain contaminant concentrations exceeding cleanup levels based on previous sampling data will be loaded directly into trucks from the remedial excavations and transported off site for disposal at a permitted facility, with the exception of material identified as potential dangerous waste based on existing data.
- Soil and debris identified as potential dangerous waste based on existing data will be temporarily stockpiled and sampled for waste designation purposes. This material will be appropriately managed based on the sampling results (either transported directly to an off-site Subtitle D facility, or first treated on site and then transported to a Subtitle D facility). Details regarding stockpile sampling for chemical characterization are discussed in Section 7.3.

As discussed in Section 7.2.5, the overburden stockpiles from grouped remedial excavation areas (Areas 5-7, Areas 8-10, and Areas 11-13) will not be mixed or used to backfill other areas.

As depicted in Phase 2 Sheets C1.6 to C1.11, segregation of excavated soils will be based primarily on the depth of the soils occur relative to the original (pre-excavation) ground surface. Elevation (depth) control during excavation will be achieved using standard land survey equipment. Stockpiled soil will be covered and secured from wind, rain, and other disturbances as appropriate to control erosion and dust. Section 7.1.2 provides additional details regarding soil stockpiling procedures.

7.2.3 Construction Dewatering and Wastewater Characterization

Construction dewatering and wastewater characterization will be performed as necessary as discussed in Section 6.2.3. In addition, for Remedial Excavation Areas 9, 11, and 12, a shoring/cut-off wall at the MHHW may be used to allow excavation up to the MHHW if necessary, and to minimize infiltration of water into the excavation.

7.2.4 Verification Sampling

Verification sampling will involve collecting soil samples from the base and sidewalls of the remedial excavations to verify that cleanup levels have been achieved and/or to document concentrations of contaminants remaining at the Site. Verification sampling will consist of the following steps:

- Discrete grab samples will be obtained from the limits of the excavations at the sampling density described in Section 11.2.
- The verification soil samples will be analyzed on a short turnaround basis to assess compliance with site-specific cleanup/remediation levels (Table 1) and minimize contractor standby time.
- At Remedial Excavation Areas 6 to 13, the base of the excavation will be dictated by the design excavation depth (6 or 10 feet bgs depending on the area) rather than attainment of cleanup levels. In these areas, the excavation base samples will be used to document contaminant concentrations remaining at the Site after soil removal actions are completed.

Verification samples for the Phase 2 cleanup action will be analyzed for antimony, arsenic, chromium, copper, lead, mercury, nickel, thallium, zinc, diesel- and heavy oil-range hydrocarbons, PCBs, cPAHs, and/or dioxins/furans depending on the remedial excavation area. Further details regarding verification sampling are provided in Section 11.2.

7.2.5 Backfilling and Compaction

Backfilling and compaction procedures will be the same as described in Section 6.2.5. Confirmed clean overburden soil from Remedial Excavation Areas 5 to 7 will be used to backfill Remedial Excavation Areas 5 to 7. Confirmed clean overburden soil from Remedial Excavation Areas 8 to 10 will be used to backfill Remedial Excavation Areas 8 to 10. Confirmed clean overburden soil from Remedial Excavation Areas 11 to 13 will be used to backfill Remedial Excavation Areas 11 to 13. The overburden soils grouped as described will not be mixed or used to backfill other areas.

7.3 Chemical Characterization of Excavated Soil for Disposal or Reuse

Excavated soil will be characterized for disposal or on-site reuse as required by MTCA and Washington State Dangerous Waste regulations and the selected disposal facility. Where possible, existing soil analytical data will be used to characterize contaminated soil for disposal. This approach will allow excavated contaminated soil to be transported directly to the disposal facility without further characterization. Based on the existing data, it is expected that additional sampling of contaminated soil for waste designation and profiling purposes will be required in those areas where potential dangerous waste has been identified.

7.3.1 Stockpile Characterization Sampling

Where stockpile characterization sampling is necessary, stockpile sampling will be performed at a frequency consistent with Table 1 of Ecology's *Guidance for Remediation of Petroleum Contaminated Soils* (Ecology, 1995), as follows:

Cubic Yards of Soil	Minimum Number of Samples
0-100	3
101-500	5
501-1000	7
1001-2000	10
>2000	10 + 1 for each additional 500 cubic yards

Discrete grab samples will be collected from various zones and/or depth horizons within the stockpiles as the stockpiles are being constructed to obtain spatially representative samples of the stockpiled material. The stockpile samples will be collected from locations that are generally representative of the soils and where field screening indicates contamination may be present. If field screening does not indicate potential contamination, the stockpile will be divided into sections and each section will be sampled. To evaluate whether stockpiled overburden soil can be reused on site as backfill, the stockpile samples will be analyzed for the constituents of potential concern at the Site (see Tables 1 and 4) and the results will be compared to the cleanup levels listed in Table 1. To evaluate whether stockpiled contaminated soil excavated from potential dangerous waste locations designates as dangerous waste, the stockpile samples will be analyzed for one or more of the following, depending on the area: arsenic, lead, mercury, copper, and/or chromium (see Table 4). Based on initial testing results, follow-up TCLP analyses may be performed as shown in Table 4.

7.3.2 Dangerous Waste Evaluation

Excavated soil determined to exceed site-specific cleanup/remediation levels will fall into one of two categories: 1) non-dangerous waste suitable for disposal at a Subtitle D facility; or 2) Washington-defined dangerous waste requiring either disposal at a Subtitle C (hazardous/dangerous waste) facility, or on-site treatment followed by disposal at a Subtitle D facility. There is no indication of listed dangerous wastes being generated or disposed of at the Site. However, existing soil analytical data indicate that some of the contaminated soil to be excavated during Phase 2 could potentially designate as dangerous waste on the basis of the dangerous waste characteristics and criteria defined in WAC 173-303. Locations with potential dangerous waste include:

- Remedial Excavation Area 8 (arsenic exceeds TCLP trigger value at LAI-S-4)
- Remedial Excavation Area 9 (lead exceeds TCLP trigger value at LSB-8 and LSB-2; copper exceeds toxicity criteria threshold at LSB-02)

- Remedial Excavation Area 10 (mercury exceeds TCLP trigger value at RTP-41; lead, chromium, and mercury exceed TCLP trigger values at RTP-02; copper exceeds toxicity criteria threshold at RTP-02)
- Remedial Excavation Area 11 (previous TCLP lead exceedance at PP-16 [6.5 to 7 feet bgs]; lead exceeds TCLP trigger value at SB-03 and PP-17; arsenic exceeds TCLP trigger value at PP-17; copper exceeds toxicity criteria threshold at SB-03)
- Remedial Excavation Area 12 (previous TCLP lead exceedance at PP-25 [1 to 1.5 feet bgs]; lead exceeds TCLP trigger value at MW-1, SB-10, and PP-22

Before any stockpiled soil is transported off site for disposal, chemical characterization data for this soil will be reviewed to evaluate potential dangerous or non-dangerous waste status, and follow-up TCLP analyses will be performed to confirm waste designation as appropriate.

Soil identified as dangerous waste will be treated on Site prior to transport to an off-site disposal facility. The contractor will develop a soil treatment plan and provide data necessary to demonstrate that the soil treatment process will be consistent with State Dangerous Waste Regulations and meet disposal criteria. The contractor's treatment plan will be submitted to Ecology for review.

Prior to transporting contaminated or treated soil to a Subtitle D facility, analytical data representative of the soil will be evaluated to ensure compliance with Federal UTS criteria (40 CFR 268.48).

7.4 Sediment Dredging

Sediment dredging will occur in two areas (Marine Dredging Areas 1 and 2) as shown in Phase 2 Sheet C2.0. Approximately 44,800 cy of contaminated sediment and wood debris will be removed from the Marine Area. This section describes sediment dredging procedures such as dredging methods/equipment, temporary sediment storage and handling (dewatering and debris separation), water quality control, verification sampling, and backfilling/capping.

7.4.1 Dredging Approach and Methods

Contaminated sediment, wood debris, brick, and derelict exposed timber piles will be removed from intertidal and subtidal portions of the Marine Area. Two areas are designated for dredging based on the post-dredging capping or backfilling requirements: (1) beach/intertidal areas will be dredged so as to accommodate a cap, and (2) subtidal areas will be dredged so as to accommodate backfilling to match the surrounding grades with a thinner layer of clean imported fill. This section describes the dredging approach and methods for these areas. Dredging will generally be performed using conventional barge-based dredging equipment (e.g., clamshell-type dredge bucket). In beach/intertidal areas, land-based equipment (e.g., an excavator) may be used for sediment/debris removal if tidal conditions/shallow water prevents barge access.

7.4.1.1 Beach/Intertidal Areas

Sediment in beach/intertidal areas will be dredged to a depth that allows placement of a minimum 2-foot thick cap at the proposed final grade. Sediment and debris will be removed using land- and/or water-based equipment depending on the work area and tidal conditions. The target removal thickness where cleanup levels are exceeded is approximately 3 feet, to facilitate placement of the cap and accompanying habitat substrate.

7.4.1.2 Subtidal Areas

In the subtidal dredge areas of the Marine Area, sediment and debris will be removed using water-based dredging equipment. The target removal thickness where cleanup levels are exceeded is 2 feet, with a 1-foot allowable overdredge.

Water-based dredging equipment will consist of a barge-mounted, clamshell-type dredge or long-reach excavator, and dredged material transport barges. Dredging will be performed from a floating dredge derrick, which will load dredged sediment onto the transport barges.

7.4.1.3 Piling Removal Procedures

Dredging of the Marine Area will include removal of derelict exposed timber piles located in the dredge areas. The exposed piles will be removed or cut off at an elevation no higher than 3 feet below the final capped or backfilled surface. Pile removal will be completed as an incidental component of the dredging. The exposed piles removed during dredging will be handled in the same manner as general wood debris mixed with dredged sediment, as described in Section 7.4.2 below.

7.4.2 Dredged Material Handling (Dewatering and Debris Separation)

The dredged material will be initially transported to the Port's Pier 2 facility for dewatering and separation of wood and other debris from contaminated sediment. The separate waste streams generated by this process will be characterized prior to transporting the material off site for disposal or, in the case of larger rock material that can be effectively cleaned, re-used at the Site.

Material dredged using water-based equipment will be placed directly on transport barges and transported to the Pier 2 facility, where the material will be placed in containment cells for dewatering and debris separation. Material dredged using land-based equipment (i.e. beach/intertidal sediments) will be trucked to the Pier 2 facility and processed in the same manner as the material transported by barge.

Sediment segregation and disposal is discussed further in Section 7.5.

7.4.3 Verification Sampling

Verification sampling will involve collecting sediment samples to document concentrations of contaminants remaining on Site following dredging. Verification sampling will be performed as follows:

- Discrete sediment samples will be collected from the final limits of the dredging areas at an approximate density of 1 sample per 40,000 square feet to document the sediment quality of the dredged surface prior to placement of cap or backfill material.

- The verification samples will be analyzed for the indicator hazardous substances and wood debris indicators listed in Table 3 to document remaining contaminant concentrations at the Site. Wood debris content (percentage) will be estimated based on visual observation of the samples in the field.

7.4.4 Backfilling/Capping

The original bathymetry within the shoreline transitional slope and subsurface areas will be re-established by backfilling/capping once the transitional slope excavation has been completed. The proposed backfilling/capping layout of the Marine Area is depicted in Phase 2 Sheets C2.4 to C2.6. Approximately 43,200 cy of material will be used to backfill and cap the dredged areas. Dredged areas will be backfilled with clean imported sand and gravel and dredged materials appropriate for habitat improvement and stability and obtained from the Swinomish Channel Dredge Site as shown in Phase 2 Sheets C2.11 to

C2.13. A minimum 2.75-foot-thick capping layer of clean sand, gravel, and armor stone will be placed along the shoreline in areas where contaminants will remain at depth. Backfill/cap designs for various areas of the Site will generally include the following elements:

- The subtidal dredged areas will be backfilled to approximate the existing grade with clean, naturally-occurring, granular material that is free of wood waste, soil, clay balls, and other extraneous objectionable materials.
- The intertidal dredge area adjacent to the Port Uplands Area will be capped with a minimum 2.75-foot-thick layer of cap materials selected to protect and stabilize the shoreline. This cap will provide long-term protection of the confined underlying sediments from direct wave-break action when exposed by tides. The proposed layout of the various cap materials is presented on Phase 2 Sheet C2.4 to C2.6.
- Along the MJB North Area shoreline, the shoreline cap will be protected from erosion with a rock armor layer placed along the shoreline. The armored cap will be constructed to the extent shown in Phase 2 Sheet C2.6. The cap will include a minimum 2.75-foot-thick rock armor layer along with a 0.5-foot-thick top dressing of sand and gravel that will be placed in the interstices of the rock.

7. 5 DREDGED SEDIMENT SEGREGATION, STORAGE, AND DISPOSAL

This section describes segregation, storage, and disposal of dredged sediment.

7.5.1 Segregation and Temporary Storage

Sediment and debris removed from intertidal and subtidal areas will be transported by truck or barge to the materials handling facility at Pier 2. The dredged material will be dewatered and segregated into like waste streams at the Pier 2 facility.

7.5.2 Disposal

Dredged material that is processed at the Pier 2 facility will be disposed of at an off-site, permitted RCRA Subtitle D facility. A portion of the sediment to be dredged may qualify for open-water disposal. If found suitable by the DMMP, sediment that meets open-water disposal requirements will be transported directly from the Site to the Port Gardner dredged material disposal site for open-water disposal. Suitability of Site sediment for open-water disposal is currently being evaluated.

Wood debris larger than 2 feet in size, included exposed piles removed during dredging, will be disposed of as solid waste at an off-site disposal facility. If significant quantities of cobbles or boulders are recovered from the dredged material, the cobbles and boulders may be reclaimed for use as fill on upland portions of the Site.

7.6 TIMBER BREAKWATER REMOVAL

The existing timber breakwater in the southern part of the Cap Sante Marina entrance (approximately 458 feet long with 430 piles, totaling roughly 2,900 cy) will be removed after construction of the two new wave attenuation structures. The removal of the existing breakwater will consist of removing all walers and piles associated with the breakwater. Piles will be removed or cut off at an elevation no higher than 3 feet below the final capped or backfilled surface.

7.7 WAVE ATTENUATION STRUCTURE CONSTRUCTION

Two wave attenuation structures to reduce wave energy and erosion will be constructed offshore of the Port Uplands Area (Phase 2 Sheet C4.1). The purpose of the wave attenuators is to reduce wave energy along the Seafarers' Park shoreline, thereby limiting erosion of exposed sediment and soil and preventing erosion of contaminated soils remaining at depth, reducing the required size of shoreline cap materials, and providing conditions for the development of eelgrass and other appropriate types of aquatic habitat. This section describes the wave attenuator dimensions and construction materials and methods.

7.7.1 Dimensions and Construction Materials

The two wave attenuators will be approximately 400 feet and 600 feet long, respectively, will range from 65 to 80 feet wide, and will be approximately 16 feet high from base to crest (maximum crest elevation of +12 feet above the mean lower-low water line [MLLW]). The eastern face of the attenuators will be sloped at approximately 2H:1V, while the western (landward) face will be sloped at approximately 1.5H:1V (Phase 2 Sheet C4.3).

The wave attenuators will be constructed using approximately 31,800 cy of imported rock. The wave attenuators will be constructed of several types of rock, including an outer armor layer sized to resist wave impacts during extreme storm events and an inner bedding layer composed of smaller rock to support the outer armor layer. Fine-grained marine habitat fill material will be placed in the voids and interstitial space of the armor rock layer on the landward face of the wave attenuators. This fine-grained fill material will be installed to fill the voids between the rocks to the maximum extent practicable. Two lighted navigational aids and four day markers will be placed on top of the wave attenuators to assist approaching boaters.

7.7.2 Rock Delivery and Placement

Wave attenuator construction will consist of placing rock from a barge using mechanical methods. The rock will be placed by clamshell bucket, stone grab, or similar method that will not drop or cast the individual rocks, but rather, will release the rocks in such a manner that they will be firmly set and properly interlocked with underlying and adjacent rocks. This interlocking is necessary to resist displacement by wave action and to provide a uniform and compact section.

7.8 SITE RESTORATION

This section outlines the planned restoration of upland and marine areas following excavation, dredging, and backfilling activities. Site restoration plans are detailed in the project contract documents, and are depicted in Phase 2 Sheets C3.0 to C3.3 and Sheets L1.2 to L1.4.

7.8.1 Upland Areas

Restoration of upland areas will include utility replacement, resurfacing/surface improvements, and revegetation/landscaping as described below.

7.8.1.1 Utilities

During the Phase 2 cleanup action, existing utilities that are interrupted will be restored and/or replaced to original condition prior to backfilling excavation areas. The majority of the utility construction during Phase 2 will consist of reconnecting the utilities that serve the Park Building. If the Park Building foundation is removed during remedial excavation, the new utility lines will be roughed in short of the building footprint during Phase 2, and the final connections to the building will be completed during Phase 3 activities when the building foundation is reconstructed.

7.8.1.2 Surface Restoration

Upland ground surfaces affected by the Phase 2 cleanup activities will be restored with clean imported fill, recycled clean fill (overburden soil) from remedial excavations, crushed rock surfacing, and/or pavement as appropriate.

Any roadways or sidewalks removed during cleanup activities will be restored to original condition. Final restoration of disturbed surfaces will be completed during Phase 3 in accordance with pavement and landscape restoration plans (see Phase 2 Sheets C3.0 to C3.3 and Sheets L1.2 to L1.4). General plans for surface restoration and landscaping during the Phase 3 cleanup action are described in Section 8.0.

7.8.2 Marine Area

Site restoration and mitigation measures for the Marine Area include backfilling/capping, placement of marine habitat fill in areas outside of dredged areas in preparation for mitigation eelgrass planting (a component of the Phase 3 cleanup action), and replacement of the pier structure. These measures are described below.

7.8.2.1 Backfill/Cap Materials and Thicknesses

Marine and shoreline backfill and cap materials will be placed across the areas of dredging and shoreline excavation to restore original grades. Source materials for subtidal and intertidal backfilling may include clean dredged sediments obtained through maintenance dredging of the Swinomish Federal Navigation Channel. In beach/intertidal areas to be capped following dredging, the capping layer will consist of an approximately 2.75- to 3-foot-thick graded mix of material ranging in size from sand to cobble. The material gradation and cap thickness are designed so that the cap will maintain a minimum thickness of 2 feet during the extreme wave environment of the design wind storm (50-year recurrence interval). Placement of this cap layer will allow wave energy to winnow the cap, resulting in a surface gradation of materials that is dynamically stable on the Site.

Four different capping material gradations have been identified to provide the widest range of substrate conditions possible, and to maximize coverage of the marine dredge areas with fine substrate. Dredged areas of lower elevation (e.g., below -2 feet MLLW) will be backfilled with an approximately 2-foot-thick layer of material appropriate for propagation of eelgrass beds.

7.8.2.1.1 Nearshore/Intertidal Area

Existing riprap along the Port property shoreline will be removed and replaced with a block retaining wall (Phase 2 Sheets C4.5 and C4.6). This will create low-sloped, fine-sediment habitat in the upper intertidal zone. The block retaining wall will be installed along the shoreline upland of the existing MHHW line, allowing the shoreline to be graded at a shallower grade than currently exists.

The nearshore dredged area, and the intertidal zone between the nearshore dredged area and the block retaining wall, will be capped with a uniform 2.75- to 3-foot-thick cap layer composed of material ranging in size from sand to cobble. These substrate gradations will be worked by wave action to form a diverse substrate that changes seasonally due to variability in the direction and intensity of wind storms. It is anticipated that the shoreline in the northern Marine Area (i.e., along the Port Uplands Area) will generally have much finer substrate than the existing substrate, due to the erosion protection provided by the wave attenuators. The resulting clean sand and gravel beach will provide higher quality habitat than current conditions, particularly for forage fish. Cross sections of the shoreline stabilization, sediment cap, and transition areas are shown in Phase 2 Sheets C2.7 to C2.10.

Protection of the beach/intertidal cap along the MJB shoreline will also be required, as this area of the shoreline will not be protected by the new wave attenuation structures (see Phase 2 Sheet 4.2). Cap protection in this area will consist of a riprap revetment (see Phase 2 Sheet C4.4).

7.8.2.1.2 Subtidal Area

Subtidal dredge areas will be backfilled to approximately the original grade with a fine-grained material suitable for eelgrass substrate. This material will be obtained from the Swinomish Channel Dredge Site.

7.8.2.1.3 Mitigation Areas

To improve substrate quality for mitigation eelgrass planting, additional marine habitat fill will be placed in areas outside of the dredge area to be backfilled as described above. The same fine-grained fill used for backfilling of the subtidal dredge areas will be placed at a thickness of 2 feet across the mitigation areas in preparation for eelgrass planting. The mitigation area to be filled prior to planting is represented as Fill Type 7 on Phase 2 Sheet C2.4. This material will be obtained from the nearby Swinomish Channel.

7.8.2.2 Eelgrass Planting/Mitigation Measures

Existing eelgrass beds in the Marine Area will be disturbed during Phase 2 construction activities. The planned dredging and backfilling will eliminate approximately 1.45 acres of existing eelgrass. The density of the existing eelgrass is low (approximately 15 turions per square meter).

Eelgrass beds disturbed by the Phase 2 cleanup action will be replanted during Phase 3. Eelgrass will be planted over approximately 2.9 acres of the Marine Area to replace and supplement eelgrass removed during dredging.

Besides the restoration of eelgrass beds, the following mitigation measures will be implemented to eliminate, reduce, and/or avoid significant adverse environmental impacts associated with the Phase 2 construction:

- Riparian plantings will be installed to enhance nearshore habitat and provide improved conditions for surf smelt spawning habitat.
- Existing large substrate (riprap, angular cobble/brick, and wood waste) in the nearshore area will be replaced with a graded mix of sand to cobble in order to improve habitat within the Marine Area (see Section 7.8.2.1.1).
- Derelict exposed timber piles will be removed, improving long-term water and sediment quality.
- Riprap on Port property will be replaced with a block retaining wall, creating low-sloped fine sediment habitat in the upper intertidal area.
- Fine substrate will be placed over the landward sides of the wave attenuators, improving habitat conditions.
- Additional macroalgae attachment sites will be created with the construction of the wave attenuators, improving habitat conditions.
- Grated structures will be incorporated to minimize shading of nearshore areas.
- Construction activities will be timed to avoid outmigration of juvenile salmonids.

7.8.2.3 Pier Replacement

A pier and float structure will be constructed to replace the function of the Port's seasonal dock to be removed prior to dredging. The replacement structure will consist of a permanent concrete pier connected by gangway to a floating structure used for launching small boats. The concrete pier structure will be constructed on steel piles. The floating small boat facility will be connected to the concrete pier by an aluminum gangway and held in place by re-installing the steel piles salvaged from the removal of the original seasonal dock.

8.0 PHASE 3 CLEANUP ACTION

This section describes the preliminary design elements of the Phase 3 cleanup action. Phase 3 will consist of permanent restoration of land surfaces in the Port Uplands Area. Planned cleanup and site restoration activities at the MJB North Area are discussed in Section 9.0.

8.1 SITE PREPARATION

The Phase 3 work area will be established by the contractor to minimize impacts to tenants in the project area and to maintain vehicle and pedestrian access in accordance with constraints to be described in the forthcoming project contract documents for Phase 3.

8.1.1 Construction Staging Area

For Phase 3, it is anticipated that the northeastern portion of Port Parcel 1 and a Port-owned property located across Q Avenue from the Site will be made available to the contractor as necessary. The staging area is expected to be used by the contractor for placement of construction trailers, contractor vehicle parking, and storage of supplies.

8.1.2 Temporary Site Controls

Temporary site controls may include site access control, traffic control, erosion control, and dust and noise control.

8.1.2.1 Site Access Control

Site access control will be performed in general accordance with the construction phasing and traffic control plans to be developed for the forthcoming project contract documents. It is anticipated that traffic control measures implemented during Phase 3 will be similar to those implemented during Phase 1 (see Section 6.1.6.1).

8.1.2.2 Traffic Control

Traffic control will be performed in general accordance with the construction phasing and traffic control plans to be developed for the forthcoming project contract documents. It is anticipated that traffic control measures implemented during Phase 3 will be similar to those implemented during Phase 1 (see Section 6.1.6.2).

Site restoration materials will be transported to the Site in trucks. It is expected that the Phase 3 work will generate a peak number of truck trips of less than 10 per day. The number of truck trips will, however, vary depending on the daily activity.

8.1.2.3 Erosion Control/Stormwater Pollution Prevention

BMPs will be used to control erosion during site restoration activities. BMPs will be implemented consistent with the Department of Ecology Stormwater Management Manual for Western Washington and the Construction Stormwater General Permit for the project. A stormwater pollution prevention plan will be prepared as appropriate by the contractor. Erosion control procedures for Phase 3 will be detailed in the forthcoming project contract documents. It is anticipated that erosion control measures implemented during Phase 3 will be similar to those implemented during Phase 1 (see Section 6.1.6.3).

8.1.2.4 Dust and Noise Control

Dust and noise control will be performed as discussed in Section 6.1.6.4.

8.2 CONSTRUCTION ACTIVITIES

This section describes anticipated site restoration activities in the Port Uplands Area, including measures to enhance upland/riparian habitat and public access.

8.2.1 Surface (Hardscape) Improvements

Approximately 52% of the Port Uplands Area will be covered by impervious surfaces after project completion. This includes existing structures, as well as replacement of existing paved areas removed to access contaminated soil, and installation of new sidewalks, parking, street improvements, and a new extended shoreline esplanade.

At the completion of the project, final improvements to the section of haul road west of R Avenue will be made, including the final lift of asphalt to meet City of Anacortes requirements. In addition, a pavement overlay may be placed over Q Avenue and R Avenue between 17th Street and Seafarers' Way. The 17th Street right-of-way (80 feet) from Q Avenue to R Avenue will be deeded to the City.

Seafarers' Park elements disturbed or temporarily relocated during the cleanup action will be replaced. Site restoration elements include replacement of the Park Building and the esplanade and gathering/staging areas adjacent to the Park Building. Associated design elements such as concrete paving, signage, and cable guardrails will be consistent with the design elements at the adjacent Boat Haven.

8.2.2 Vegetation/Landscaping

Areas to the south and north of the Park Building and parking areas will be landscaped with lawn and low-growing plants. In addition, focused areas of riparian vegetation will be installed along the Port shoreline between a new small-boat launching facility and the southern Port property boundary. This vegetation is intended to provide shade for anticipated surf smelt spawning habitat that will exist at approximately +8 feet MLLW (i.e., the toe of the shoreline stabilization) upon completion of the Phase 2 cleanup action.

Site restoration landscaping will also include planting areas adjacent to street frontages, within and adjacent to parking areas, and along pedestrian walkways. These plantings will consist of drought-tolerant and low-growing shrubs. Riparian vegetation installed along the southern portion of the Port shoreline will consist of trees and shrubs that overhang the tidal habitat areas. These planting areas will be periodically interspersed with groups of lower shrubs and low groundcovers to provide view corridors.

8.2.3 Eelgrass Planting

Eelgrass beds disturbed by the Phase 2 actions will be replanted as a component of Phase 3 construction. Placement of marine habitat fill across approximately 2.9 acres of the Marine Area will be completed during Phase 2 construction. Eelgrass will be planted across the area of habitat fill shown in Phase 2 Sheet C2.4.

9.0 PHASE 4 CLEANUP ACTION

As described in the CAP, approximately 3,000 cy of contaminated shallow soil will be excavated from the interior portion of the MJB North Area (i.e., west of the 75-foot shoreline buffer zone). Based on the existing Site characterization data, soils above Site cleanup levels are not anticipated to extend below 6 feet bgs. However, as with the Phase 1 cleanup action, localized areas of deeper soil contamination containing indicator hazardous substance concentrations above the cleanup levels may be left in place on Site. Any such residual exceedances will be addressed through institutional controls (e.g., environmental covenants).

Prior to excavation, a utility locate will be conducted. To the extent practicable, all utilities will be protected and if removal is required, utilities will be repaired to pre-construction conditions. Existing MJB North Area interior monitoring well MW-7 will be abandoned (note that shoreline wells MW-1 and MW-5 will be abandoned during Phase 2; see Section 7.1.9). Excavated soils will be transported directly to an approved off-site disposal facility. BMPs and appropriate engineering controls will be employed for stormwater, dust, and noise control. Verification sampling will involve collecting soil samples from the base and sidewalls of the remedial excavations to verify that cleanup levels have been achieved and/or to document concentrations of contaminants remaining at the Site.

9.1 SITE PREPARATION

The Phase 4 work areas will be established by the contractor to minimize impacts to existing property uses and facilities. Site preparation also consists of those activities performed by the contractor to establish BMPs necessary to prevent impacts to the environment during construction.

9.1.1 Construction Staging Area

A northern portion of the MJB property will be made available to the contractor as a staging area. The staging area will be used by the contractor for placement of construction trailers, contractor vehicle parking, and storage of supplies.

9.1.3 Haul Routes

The haul road constructed during Phase 1 will be used for overland transport of soil in trucks and for other construction-related traffic entering and leaving the project site.

9.1.4 Hours of Operation

Work associated with the cleanup action will be performed during hours allowed by City of Anacortes municipal code. City of Anacortes allowable work hours are 7:00 a.m. to 10:00 p.m. Exceptions to the allowable work hours may be made for utility connections in order to minimize tenant and property owner impacts. A variance will be required for work outside of the allowable hours. Variance on the allowable work hours will be coordinated with the City of Anacortes.

9.1.5 Temporary Site Controls

Temporary site controls will include site access control, erosion control/stormwater pollution prevention, and dust and noise control.

9.1.5.1 Site Access Control

Prior to the start of Phase 4 work, the contractor will install temporary fencing to limit access to the Site. The contractor will be responsible for providing and installing all other fencing, barricades, signage, and other traffic control devices necessary for cordoning off the work site. Vehicles will enter and leave the site via the construction haul road.

9.1.5.2 Erosion Control/Stormwater Pollution Prevention

BMPs will be used to control erosion during site restoration activities. BMPs will be implemented consistent with the Department of Ecology Stormwater Management Manual for Western Washington and the Construction Stormwater General Permit for the project. A stormwater pollution prevention plan will be prepared as appropriate by the contractor. Erosion control procedures for Phase 4 will be detailed in the forthcoming project contract documents. It is anticipated that erosion control measures implemented may include:

- Erosion of exposed soil will be prevented and materials that could contribute pollutants to stormwater will be contained.
- Soil and silt will be prevented from entering storm drains through the use of silt fencing, silt dikes, storm drain inlet protection, catch basin silt barriers, fabric filter fences, straw bales, interceptor swales, wattle and rock check dams, and/or similar BMPs.
- The truck wheel wash installed in the westbound lane of the haul road will be used so that trucks leaving the site will not track soil off site.

9.1.5.3 Dust and Noise Control

Site grading and excavation work could generate airborne dust. Engineering controls will be used during construction (e.g., wetting or covering exposed soil), as necessary, to meet Northwest Clean Air Agency substantive restrictions on off-site transport of airborne particulates. Construction traffic will exit the property through the existing haul route and wheel wash. Because equipment will not be operating on paved surfaces prior to the wheel wash street sweeping will not be required. The contractor will not be allowed to track soils off site onto paved surfaces.

Construction noise will be generated by a variety of construction equipment, including truck engines, generators and other small engines, and earthmoving equipment. Construction noise will be limited to daytime hours and is not expected to create adverse impacts due to the lack of sensitive noise receptors in the area. Construction activities will be carried out in a manner consistent with City of Anacortes municipal code and State environmental noise standards. The City of Anacortes allowable work hours are 7:00 a.m. to 10:00 p.m. A variance will be required for work outside of these hours. Noise monitoring will be conducted if required by the City.

9.1.6 Utility Protection/Relocation

Site utilities will be located prior to any excavation activities. The contractor will be responsible for field-locating existing utilities using methods such as potholing prior to beginning excavation work. Utilities identified in the vicinity of the remedial excavation areas will be decommissioned and/or temporarily disconnected and rerouted as necessary prior to and during excavation activities. Utilities will be rerouted and/or restored during and after completion of backfilling and grading.

9.1.7 Monitoring Well Abandonment

Monitoring well MW-7 is located within Remedial Excavation Area MJB1. This well will be abandoned by a Washington-licensed driller in accordance with Ecology requirements (WAC 173-160-460) prior to any soil excavation in this area. Any additional wells identified within excavation areas will also be abandoned in accordance with these regulations.

9.1.8 Excavation Shoring/Foundation Protection

Where a sloped excavation infringes on, or potentially endangers or compromises an existing site facility or feature, the contractor will provide shoring, sheeting, and/or bracing as required to perform the earthwork. Excavation slopes and shoring, where necessary, will comply with Washington State construction safety standards for excavation, trenching, and shoring (WAC 296-155, Part N). The contractor will select and design the means, methods, and sequencing of shoring for the Phase 4 excavations. Although permanent shoring/foundation protection is not expected to be necessary, as-builts for any permanent shoring/foundation protection, if used, will be included in the final construction completion report.

9.1.9 Cultural/Archaeological Preservation

A cultural resources assessment was completed for the Site in January 2009 to evaluate whether cleanup activities could potentially encounter cultural artifacts or archaeological remains that might be present in the subsurface (HRA, 2009a; Appendix D). Based on the results of the cultural resources assessment, an archaeological monitoring plan was prepared for excavation activities that have the potential to encounter cultural artifacts or archaeological remains (HRA, 2009b; Appendix E). Excavation activities conducted within the Phase 4 limits that extend deeper than 3 feet bgs (i.e., below historical fill) will be monitored by a qualified archaeological resources specialist. The archaeological monitoring plan (Appendix E) establishes procedures to follow if cultural artifacts or archaeological remains are encountered. The archaeological monitoring plan was approved by the USACE on May 18, 2009 (USACE, 2009).

9.2 SOIL EXCAVATION

This section describes planned soil excavation activities, including the excavation approach and methods, soil segregation and stockpiling, construction dewatering, verification sampling, and backfilling and compaction.

9.2.1 Excavation Approach and Methods

During Phase 4A, contaminated soil will be excavated at four areas[2] within the MJB North Area as shown on Contract Drawing C-1. Final Drawings for the Phase 4B remedial excavations will be refined and completed after the Phase 2 project has been completed and the construction haul road has been removed in 2010. Soil excavation will be performed using commonly available excavation methods. Consistent with other Site remediation activities, it is anticipated that excavation procedures will include the following:

- At each remedial excavation area, soil excavation will be initiated at the designated locations shown on construction drawings. Sidewall sample results will dictate the need for additional excavations within each area to achieve cleanup goals. Excavation will be performed using standard earthmoving equipment.
- Once the initial design excavation limits are reached, verification soil samples will be collected for laboratory analysis from the excavation sidewalls and base as discussed in Sections 9.2.3 and 11.2.
- If the verification samples collected from the excavation sidewalls indicate that further lateral excavation is necessary to achieve soil cleanup levels, additional excavation will be performed

[2] The Cleanup Action Plan identified six preliminary excavation areas. Two of these areas are adjacent to the 75-foot Marine Area shoreline buffer zone and the Phase 2 work area and will be address as part of Phase 4B.

until subsequent verification samples obtained from the excavation sidewalls indicate that clean limits have been achieved.

- If verification samples collected from the excavation base exceed cleanup levels prior to reaching the conditional point of compliance (6 feet bgs), additional vertical excavation will be performed until subsequent verification samples meet cleanup levels or until the excavation depth reaches the conditional point of compliance.
- Excavations extending below the water table will be completed using commonly available dewatering techniques to minimize the water content of the excavated materials to the extent possible.

9.2.2 Soil Disposal

Upon excavation, soil from the Phase 4 cleanup action will be transported directly to an approved off-site Subtitle D facility for disposal. TCLP testing was completed and verifies that Phase 4A material does not characterize as dangerous waste (refer to Appendix I). During the final design of Phase 4B, additional testing would also be performed to verify that those materials could also be disposed of directly in a Subtitle D facility. No soil will be reclaimed for on-site testing and re-use.

9.2.3 Verification Sampling

Verification sampling will involve collecting soil samples from the base and sidewalls of the remedial excavations to verify that cleanup levels have been achieved and/or to document concentrations of contaminants remaining at the Site. Verification sampling will consist of the following steps:

- Discrete grab samples will be obtained from the limits of the excavations at the sampling density described in Section 11.2.
- The verification soil samples will be analyzed on a short turnaround basis to assess compliance with site-specific cleanup levels (Table 1) and minimize contractor standby time.
- In the event that the base of any excavation extends to a depth of 6 feet bgs (i.e., the conditional point of compliance), the excavation base samples will be used to document contaminant concentrations remaining at the Site after soil removal actions are completed.

Soil verification samples for the Phase 4 cleanup action will be analyzed for metals and cPAHs. Further details regarding verification sampling are provided in Section 11.2.

9.2.4 Backfilling and Compaction

The contractor will survey the excavation limits prior to any backfilling for the purpose of developing as-built drawings and to compute pay volumes. The contractor will also survey the backfilled limits of excavation areas following placement of any stockpiled overburden soil that is reused as backfill, for the purpose of reporting.

Remedial excavations will be backfilled and compacted to surface grade with clean and suitable materials. A geotextile fabric, or equivalent, will be placed at the base of the excavation as an environmental marker if the excavation does not achieve complete removal of contaminated soil (as indicated based on existing data or verification sample results). Reuse of overburden soil will not be allowed for Phase 4 work and all backfill materials will be imported. The contractor will provide written verification that all imported granular fill materials have been tested and certified to be free of contaminants at concentrations above the soil cleanup levels listed in Table 1. The source for the fill material and analytical results will be provided to Ecology as soon as the source is identified. This work will also be documented in the construction completion report for the project.

9.3 CHEMICAL CHARACTERIZATION OF EXCAVATED SOIL FOR DISPOSAL

Excavated soil will be characterized for disposal as required by MTCA, Washington State Dangerous Waste regulations, and the selected disposal facility. TCLP testing was performed and verifies that Phase 4A material does not characterize as dangerous waste. The results of these tests are included in Appendix I and will be provided to Waste Management and Allied Waste Services (Roosevelt Regional Landfill) for approval prior to the start of the Phase 4A work. This approach will allow excavated contaminated soil to be transported directly to the disposal facility without further characterization. During the final design of Phase 4B, additional testing would also be performed to verify that those materials could also be disposed of directly in a Subtitle D facility .

9.4 SITE RESTORATION

Upland ground surfaces affected by the Phase 4 cleanup activities will be restored/finished with clean imported fill, crushed rock surfacing, and/or pavement as appropriate. Any roadways or utilities removed during cleanup activities will be restored to original condition.

10.0 INSTITUTIONAL CONTROLS (RESTRICTIVE COVENANTS)

The site-wide cleanup action is expected to leave some contaminated soil in place below 6 feet bgs or beneath Site structures. Although residual contamination in soil below 6 feet bgs is deep enough to not pose current risks to human health and terrestrial ecological receptors, future development within areas of remaining contaminated soil could potentially generate conditions requiring appropriate safe handling procedures, stormwater controls, and consideration of disposal options for the indicator hazardous substances and concentrations encountered.

The only location where it is anticipated that contaminated soil will be left in place during the Phase 1 cleanup action is Remedial Excavation Area 2 adjacent to the Anacortes Concepts, LLC building. Soil arsenic concentrations within Remedial Excavation Area 2 exceed the Site cleanup level. Soil at this location will be removed to the extent practicable. However, it is possible that the arsenic-contaminated soil may extend under the Anacortes Concepts, LLC building. The excavation at this location will be performed so as not to impact the structural integrity of the building, resulting in the potential to leave contaminated soil in place.

The anticipated locations where contaminated soil will be left in place during the Phase 2 cleanup action include the following:

- **Northwest Educational Service Building** – The east end of the Northwest Educational Service Building on Port Parcel 2 was constructed over deep (6 to 15 feet bgs) contaminated soil present near the southern end of the subsurface containment wall adjacent to the shoreline. The excavation planned in the vicinity of this building (Remedial Excavation Area 10) is expected to leave contaminated soil in place beneath the building and at a distance from the building established to ensure the structural integrity of the building.
- **Other Port Upland Areas Below 6 feet bgs** – The cleanup objective for upland areas of the Port property outside of the shoreline buffer zone, the petroleum hydrocarbon removal area adjacent to the Park Building (Remedial Excavation Area 5), and the Parcel 1 arsenic removal area (Remedial Excavation Area 3), is to remove contaminated soil within 6 feet bgs that exceeds

cleanup levels. There are areas of soil contamination below 6 feet bgs that will be left in place. These areas are either currently underneath a 6-foot column of clean soil, or will be below 6 feet of clean backfill following soil removal in the upper 6 feet.

- **Shoreline Buffer Zone** – The estimated maximum depth of contamination within the shoreline buffer zone is approximately 16 feet bgs. Because excavation in the shoreline buffer zone will not extend below 10 feet bgs, localized areas of deeper soil contamination exceeding cleanup/remediation levels will remain in this area of the Site.

Restrictive covenants will be required for the portions of the Site where complete removal of soil exceeding cleanup/remediation levels will not be achieved. The covenants will restrict future development and will identify specific contaminated soil locations, depths, and approximate volumes that will require special management if disturbed, unless the soil contamination is removed at a later time. (Note: this information will also be included in the construction completion report.) The covenants also will require that soil management plans be developed prior to performing any future invasive work in areas of remaining contaminated soil. Draft restrictive covenants are included in Appendix A.

The areas of residual contaminated soil will be documented with the results of post-excavation verification sampling, and will continue to be addressed through restrictive covenants and confirmational/long-term monitoring. The restrictive covenants will be finalized and recorded after site restoration activities are completed. Copies of the recorded restrictive covenants will be sent to Ecology.

11.0 COMPLIANCE MONITORING

Compliance monitoring will be implemented during the site-wide cleanup action in accordance with WAC 173-340-410. The three types of compliance monitoring to be conducted include protection monitoring, performance monitoring, and confirmational monitoring. The objectives of compliance monitoring are to protect human health and the environment during the cleanup action (protection monitoring), verify that cleanup standards have been achieved (performance monitoring), and confirm the long-term effectiveness of the cleanup action (confirmational monitoring). Compliance monitoring activities are described in the following subsections. Table 4 shows the general analytical testing plan for performance and confirmational monitoring.

11.1 PROTECTION MONITORING

Human health and the environment will be protected during the cleanup action through the use of worker health and safety measures and environmental protection measures designed to protect air and surface water quality.

11.1.1 Worker Health and Safety

Cleanup-related construction activities will be performed in accordance with the requirements of the Washington Industrial Safety and Health Act (RCW 49.17) and the Federal Occupational Safety and Health Act (29 CFR 1910, 1926). These regulations include requirements that workers are to be protected from exposure to contaminants and that excavations are to be properly shored. A site health and safety plan (HASP) applicable to GeoEngineers' work is included as Appendix B and is discussed further in Section 15.0. The cleanup contractor will prepare and implement a separate HASP covering its work activities. Within contaminated areas, workers will be required to have current hazardous waste operations and emergency response (HAZWOPER) training. Earthwork associated with known or potentially contaminated materials will be conducted in accordance with the contractor's HASP.

11.1.2 Environmental Protection

Environmental protection measures will include dust control measures and surface water quality control measures.

11.1.2.1 Air Emissions and Dust Control

Short-term air emissions are expected to be limited to engine exhaust from trucks, earthmoving equipment, and other construction-related vehicles and equipment. In addition, site grading or excavation work could generate airborne dust. Dust control measures will be implemented by the contractor as discussed in Sections 6.1.6.4, 7.1.7.4, 8.1.2.4, and 9.1.6.4.

11.1.2.2 Surface Water Quality Control

Surface water quality control measures will be implemented by the contractor as discussed in Section 7.1.7.5. As a condition of the Ecology Construction Stormwater General Permit, the contractor will develop a stormwater pollution prevention plan. The contractor will inspect and maintain the stormwater management, erosion and sediment control, and spill prevention and control BMPs associated with the work.

11.2 PERFORMANCE MONITORING

Performance monitoring will be conducted to verify that the cleanup action attains soil and sediment cleanup standards established for the Site. This section describes performance monitoring methods including verification of soil excavation and sediment dredging elevations and cap thicknesses, soil verification sampling, and sediment verification sampling. Planned chemical characterization sampling of soil excavated during the Phase 1, Phase 2, and Phase 4 cleanup actions is discussed in Sections 6.3, 7.3, and 9.3, respectively.

11.2.1 Verification of Soil Excavation and Sediment Dredging Elevations and Cap Thicknesses

Performance monitoring following soil excavation and sediment dredging will initially include topographic or bathymetric surveys to verify that at least 90 percent of the excavation or dredge area has achieved the required cut elevations, with the caveat that "high-spots" above the required elevations (i.e., up to 10 percent of the area) are relatively isolated (i.e., non-contiguous), and not the result of intentional bias during implementation. Surveys will also be performed upon completion of backfilling and cap construction activities to verify conformance with design backfill/cap thicknesses and elevations.

11.2.2 Soil Verification Sampling

Once required cut elevations have been verified at each upland remedial excavation area, soil samples will be obtained from the limits of the excavation to verify that the soil cleanup and remediation levels shown in Table 1 have been achieved and/or to document contaminant concentrations remaining in place at depth. Soil verification sampling will be conducted as follows:

- Discrete grab samples will be obtained from the sidewalls and base of the uplands remedial excavations at a density comparable to the average sampling density used to characterize the Site during the RI.
    - Remedial excavation will proceed laterally until cleanup/remediation levels are achieved on the excavation sidewalls (with the exception of dioxin/furans, as described below). In excavations completed outside of the shoreline buffer zone, sidewall samples will be collected at a frequency of one sample per 40 linear feet of sidewall. If the perimeter of

the excavation is less than 40 feet, a minimum of four sidewall samples will be obtained (i.e., one sample per sidewall assuming a four-sided excavation). In excavations completed within the shoreline buffer zone, sidewall samples will be collected at a frequency of two samples per 40 linear feet of sidewall (one from 0 to 6 feet bgs and one from 6 to 10 feet bgs) for comparison to the depth-dependent cleanup/remediation levels applicable to the shoreline buffer zone (see Table 1).

  - In Remedial Excavation Areas 3, 5, MJB1, MJB2, MJB3, and MJB4, excavation will proceed vertically until cleanup levels are achieved on the excavation base (with the exception of dioxin/furans, as described below). Base samples in Remedial Excavation Areas 3, 5, MJB1, MJB2, MJB3, and MJB4 will be collected at a frequency of one sample per 600 square feet of base area. If the area of the base is less than 600 square feet, a minimum of one base sample will be obtained.
  - In Remedial Excavation Areas 1, 2, 4, and 6 to 13, the base of the excavations will be dictated by the design excavation depth rather than attainment of cleanup or remediation levels. Because these excavations will not be completed deeper than 6 feet bgs (Areas 1, 2, and 4) or 10 feet bgs (Areas 6 to 13), some localized contaminated soil may remain in place in the excavations. Therefore, base samples from these excavations will be used to document contaminant concentrations remaining in place. Base samples in Remedial Excavation Areas 1, 2, 4, and 6 to 13 will be collected at a frequency of one sample per 2,000 square feet of base area. If the area of the base is less than 2,000 square feet, a minimum of one base sample will be obtained.

- Soil verification samples will be analyzed only for those constituents known to exceed soil cleanup or remediation levels at each remedial excavation area based on existing analytical data. The samples will be analyzed on a short turnaround basis to allow timely decision-making regarding the need for further excavation to achieve cleanup levels.
- As with other constituents, dioxins/furans will be analyzed only in areas where dioxins/furans are intentionally removed as part of the cleanup action. However, dioxin/furan results will only be used to document concentrations that are left in place at the excavation limits. Accordingly, one discrete base sample and one four-point composite sidewall sample will be obtained for dioxin/furan analysis at each remedial excavation area where dioxins/furans are intentionally removed. Samples collected for dioxin/furan analysis will be placed on hold at the laboratory and analyzed only after verification sample results for other constituents indicate that cleanup levels have been achieved.
- Soil verification sampling results for a given remedial excavation area may be evaluated using Ecology's Statistical Guidance for Site Managers (Ecology, 1992) if at least ten verification samples are collected from the excavation. If sidewall verification sample results for target constituents do not exceed soil cleanup or remediation levels, no further excavation will be performed. If sidewall verification sample results exceed cleanup or remediation levels, additional excavation will be performed. Following each additional excavation, one or more verification samples will be obtained from the limits of the extended excavation to verify attainment of cleanup/remediation levels. The same approach will be used to determine final vertical excavation limits at remedial excavation areas where the base of the excavation is not dictated by the design excavation depth (i.e., Remedial Excavation Areas 3, 5, MJB1, MJB2A, MJB3, and MJB5). Additional verification samples obtained from the extended excavations will be collected at the same frequencies as the initial verification samples.
- This process will be repeated until cleanup levels have been attained.

- In areas where excavation activities leave contaminated soil in place (as indicated based on existing data or verification sample results), a geotextile fabric will be laid across the bottom of the excavations prior to backfilling to demarcate the vertical extent of the excavations.

11.2.3 Sediment Verification Sampling

Once required sediment removal elevations have been verified by comparison of pre- and post-dredge surveys, sediment samples will be collected to document concentrations of contaminants remaining in the Marine Area prior to backfilling/capping. Sediment verification sampling procedures will include the following:

- Discrete grab samples will be collected from the base of the sediment removal areas at an approximate density of 1 sample per 40,000 square feet.
- The sediment verification samples will be submitted for analysis of indicator hazardous substances and wood debris indicators listed in Table 3 to document remaining contaminant concentrations. Wood debris content will be estimated based on visual observations.

11. 3 CONFIRMATIONAL (LONG-TERM) MONITORING

Confirmational monitoring will be performed after the site-wide cleanup action is completed to evaluate the long-term effectiveness of the cleanup action. This section describes confirmational monitoring methods including groundwater monitoring, Marine Area backfill and cap monitoring, and biological monitoring. A long-term monitoring plan for the Site will be prepared and submitted with the construction completion report after cleanup and site restoration activities are completed.

11.3.1 Groundwater Monitoring

Confirmational groundwater monitoring will be performed quarterly for a minimum of one year after the cleanup action is completed to evaluate the long-term effectiveness of the cleanup action. The four consecutive quarterly monitoring events will be initiated after cleanup and site restoration activities are completed.

A network of groundwater monitoring wells will be established at the Site, as approved by Ecology. The groundwater monitoring wells will be sampled for the constituents of potential concern identified in Site soils, including dissolved metals, diesel- and heavy oil-range hydrocarbons, PCBs, and cPAHs (see Table 4). In addition, groundwater samples collected during the first quarterly monitoring event will be analyzed for dioxins/furans. The monitoring well network will include existing and new monitoring wells to be installed after cleanup activities are completed. Both shoreline and inland area wells will be monitored. New monitoring wells will be installed at locations selected in consultation with Ecology, and will be constructed in accordance with the requirements of WAC 173-160.

Results of the groundwater monitoring will be reviewed by Ecology to determine if the confirmational monitoring objectives have been met.

11.3.2 Marine Area Cap and Backfill Monitoring

To ensure that aquatic protection, cap/backfill stability, and substrate suitability objectives continue to be met in the future, long-term Marine Area cap and backfill monitoring will be performed.

As described in the CAP, two rounds of post-construction sediment bioassay monitoring will be performed in the beach/intertidal cap and subtidal backfill areas (see Table 4). Surface sediments will be sampled at the six stations that previously failed bioassay tests during the RI, and at one or more stations located closer to the existing sheet pile wall along the shoreline. If the bioassay samples fail, retesting will be performed to confirm the initial bioassay results, and follow-up chemical analyses will be performed as necessary.

In addition to bioassay monitoring, the Port will monitor integrity of the cap and backfill areas through visual observation and repeat bathymetric surveys. Details of the Marine Area cap and backfill monitoring will be presented in the long-term monitoring plan submitted with the construction completion report.

11.3.3 Marine Area Biological Monitoring

To ensure that habitat mitigation/restoration objectives continue to be met in the future, long-term habitat recovery monitoring will be performed, which will include monitoring of eelgrass and other aquatic organisms.

The cleanup contractor will monitor and manage the habitat plantings through the end of the cleanup action to ensure the successful establishment and survival of the plantings. Details of the Marine Area biological monitoring will be presented in the long-term monitoring plan submitted with the construction completion report.

12.0 CONTINGENCIES PLAN

The planned performance monitoring will ensure that contaminated soil and sediments are removed to the extent practicable. Confirmational (long-term) groundwater and sediment monitoring will ensure that deeper contaminated soil left in place does not pose a risk to the Marine Area via contaminant migration to groundwater and sediment/surface water. Groundwater sampling completed during the RI demonstrated that groundwater at the existing shoreline wells complies with groundwater cleanup levels, indicating that leaching of soil contaminants to groundwater is not currently an exposure pathway of concern. However, the remedial excavation activities may create soil disturbances that mobilize sorbed contaminants below the water table. If contaminants are detected above cleanup levels in groundwater and/or sediment after an initial four quarters of confirmational groundwater monitoring, semi-annual groundwater and/or sediment monitoring will be conducted as appropriate. If groundwater and/or sediment samples continue to exceed the cleanup levels without abating, additional actions will be considered. Similarly, if long-term monitoring indicates that shoreline protection, cap/backfill stability, substrate suitability, and/or habitat mitigation/restoration objectives are not being achieved, contingency actions will be developed and implemented as approved by Ecology.

A detailed contingencies plan for the Site will be prepared and submitted with the construction completion report after cleanup and site restoration activities are completed.

13.0 FINANCIAL ASSURANCE

Pursuant to WAC 173-340-440(11) and the terms of the Consent Decree, the Port, K-C, and MJB will provide to Ecology financial assurances sufficient to cover costs associated with the operation and maintenance of the cleanup action at the Site, including institutional controls, compliance monitoring, and corrective measures. In addition, the PLPs will adjust the financial assurance coverage if necessary, and provide Ecology's project coordinator with documentation of the updated financial assurance, in accordance with the terms of the Decree.

14.0 QUALITY ASSURANCE/QUALITY CONTROL

This section describes general QA/QC procedures to be implemented during the cleanup action, including contractor quality control, construction monitoring and field documentation, and analytical QA/QC. Details regarding analytical QA/QC are presented in the Quality Assurance Project Plan (QAPP), included as Appendix C of this report.

14.1 CONTRACTOR QUALITY CONTROL

The contractor will prepare a construction quality assurance plan before commencing work. This plan will include construction plans for each of the primary elements of work, as well as a quality control plan. The quality control plan will address the following:

- General requirements;
- Quality control organization;
- Documentation of methods and procedures;
- Requirements for corrective action when QC and/or acceptance criteria are not met; and
- Any additional elements that the contractor deems necessary to adequately control construction processes required by the contract.

The contractor will maintain QC records. These records will include evidence that the required inspections or tests have been performed, including the type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed corrective action; and corrective actions taken.

In addition to the contractor's construction quality assurance plan, the Port will perform general oversight of the contractor's activities.

14.2 CONSTRUCTION MONITORING AND FIELD DOCUMENTATION

Construction monitoring will be performed by the Port and its representatives. A comprehensive record of field activities will be maintained. Field documentation for this project will include field notes, field forms, field reports, and chain-of-custody forms for samples submitted for analytical testing. The field documentation will record construction, sampling, and monitoring activities, sampling personnel, and weather conditions, as well as decisions, corrective actions, and/or modifications to the project plans and procedures discussed in this report.

14.3 ANALYTICAL QA/QC

Analytical QA/QC is described in the QAPP (Appendix C). The QAPP describes soil, sediment, and groundwater sampling, analysis, and QC procedures that will be implemented to produce chemical and field data that are representative, valid, and accurate for use in evaluating the effectiveness of the cleanup action.

15.0 HEALTH AND SAFETY

Cleanup-related construction activities will be performed in accordance with the requirements of the Washington Industrial Safety and Health Act (RCW 49.17) and the Federal Occupational Safety and Health Act (29 CFR 1910, 1926). These regulations include requirements that workers are to be protected from exposure to contaminants and that excavations are to be properly shored.

A site HASP describing actions that will be taken to protect the health and safety of GeoEngineers personnel (the Port's environmental construction management consultant) is provided in Appendix B. The Port's cleanup contractor will be required to prepare and submit a separate HASP for use by contractor personnel. Personnel engaged in work that involves hazardous material excavation and handling will comply with MTCA safety and health provisions in WAC 173-340-810 and will be HAZWOPER, OSHA, and WISHA certified as necessary.

16.0 SCHEDULE

Pending permit approvals, cleanup-related construction work is scheduled to begin in June 2009 and is expected to be completed within approximately two years of the construction start date. The Phase 1 cleanup action will begin in June 2009. The Phase 2 construction is anticipated to begin July 15, 2009. In-water construction components of Phase 2 would be suspended between January 14, 2010 and July 16, 2010 due to the permitted in-water work restrictions. Phase 3 will be implemented following completion of all Phase 2 activities. Phase 4 is anticipated to occur concurrent with Phase 2 work. Depending on contractor procurement for Phase 4, the work is anticipated to be initiated in the fall of 2009, with completion in late 2009 or early 2010.

17.0 REPORTING

The following reports will be prepared to document the cleanup action:

- **Construction Completion Report.** Upon completion of cleanup-related construction activities, a construction completion report summarizing the cleanup activities and results of performance monitoring will be prepared in accordance with WAC 173-340-400. Waste manifests, contaminated soil disposal receipts, and as-built drawings will be included in the construction completion report. A long-term monitoring plan and a contingencies plan also will be submitted with the report. A draft version of the construction completion report will be submitted to Ecology for review and comment prior to finalization.
- **Confirmational Groundwater Monitoring Report.** A report summarizing the results of confirmational groundwater monitoring will be prepared upon completion of the four quarterly groundwater monitoring events.

Compliance monitoring data generated during the cleanup action will be provided to Ecology in the electronic format required by Ecology's Environmental Information Management Policy 840.

18.0 LIMITATIONS

USE OF THIS REPORT

This report has been prepared for the exclusive use of the Port of Anacortes, Kimberly-Clark Corporation, MJB Properties, and the Washington State Department of Ecology. Any use of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and written authorization by GeoEngineers, Inc. and Anchor Environmental, L.L.C., shall be at the user's sole risk. Any unauthorized use of (or reliance on) this report shall release GeoEngineers and Anchor Environmental from any liability resulting from such use (or reliance). Within the limitations of scope, schedule, and budget, GeoEngineers, Inc.'s and Anchor Environmental, L.L.C.'s respective services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. GeoEngineers, Inc. and Anchor Environmental, L.L.C. assume no responsibility for any consequence arising from any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available.

We have prepared this report for the exclusive use of the Port of Anacortes, Kimberly-Clark Corporation, its authorized agents, and regulatory agencies. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.

Within the limitations of scope, schedule and budget, GeoEngineers, Inc.'s and Anchor Environmental, L.L.C.'s services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, expressed or implied, should be understood.

Any electronic form, facsimile, or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and Anchor Environmental, L.L.C. and will serve as the official document of record.

19.0 REFERENCES

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TABLE 1
SOIL CLEANUP/REMEDIATION LEVELS FOR INDICATOR HAZARDOUS SUBSTANCES
FORMER SCOTT PAPER COMPANY MILL SITE

Area	Uplands		Shoreline Buffer Zone			Import Fill & Overburden Soil Stockpile Criteria for Use as Backfill
	Port	MJB	Port	MJB	Port & MJB	
Depth	All Depths		< 6 feet bgs		6-10 feet bgs	
Constituent	Site-Specific MTCA Method B		Lowest of Site-Specific MTCA Method B or Sediment CSL		Sediment CSL	
Metals (mg/kg)						
Antimony	32	32	32	32	NA	32
Arsenic	20	20	20	20	NA	20
Chromium (total)	117	117	117	117	NA	117
Copper	100	366	100	366	390	100
Lead	220	220	220	220	530	220
Mercury	9	9	0.59	0.59	0.59	0.59
Nickel	100	977	100	977	NA	100
Thallium	5.6	5.6	5.6	5.6	NA	5.6
Zinc	270	662	270	662	NA	270
Total Petroleum Hydrocarbons (mg/kg)						
Diesel-Range	2,000*	2,000*	2,000*	2,000*	2,000*	2,000
Heavy Oil-Range	2,000*	2,000*	2,000*	2,000*	2,000*	2,000
cPAHs (mg/kg)						
Total cPAHs TEQ	0.14	0.14	0.14	0.14	NA	0.14
PCBs (mg/kg)						
Total PCBs	1	1	1	1	1.3**	1
Dioxins and Furans (ng/kg)						
Total dioxins/furans - human health TEQ	11	11	11	11	NA	11
Total dioxins - ecological TEQ	5	5	5	5	NA	5
Total furans - ecological TEQ	3	3	3	3	NA	3

Notes:

cPAHs = Carcinogenic polycyclic aromatic hydrocarbons

PCBs = Polychlorinated biphenyls

TEQ = Toxicity Equivalent Quotient

mg/kg = Milligrams per kilogram

ng/kg = Nanograms per kilogram

CSL = Cleanup Screening Level (WA Sediment Management Standards)

NA = Not applicable (not a sediment constituent of concern)

* MTCA Method A Cleanup Level

**Based on sediment CSL chemical criteria, normalized to the average Site sediment total organic carbon level of 2 percent

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TABLE 2
GROUNDWATER CLEANUP LEVELS FOR INDICATOR HAZARDOUS SUBSTANCES
FORMER SCOTT PAPER COMPANY MILL SITE

Constituent	Site-Specific MTCA Method B Groundwater Cleanup Level (ug/L)
Metals	
Antimony	640
Arsenic	8
Chromium (total)	50
Copper	20
Lead	8.1
Mercury	0.04
Nickel	22
Zinc	160
Total Petroleum Hydrocarbons	
Diesel-Range	500*
Heavy Oil-Range	500*
cPAHs	
Total cPAHs TEQ	0.1
PCBs	
Total PCBs	1.8
Dioxins and Furans	
Total dioxins/furans TEQ	0.000034

Notes:

* MTCA Method A Cleanup Level

cPAHs = Carcinogenic polycyclic aromatic hydrocarbons

PCBs = Polychlorinated biphenyls

TEQ = Toxicity Equivalent Quotient

ug/L = Micrograms per liter

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TABLE 3
SEDIMENT CLEANUP LEVELS
FOR SEDIMENT CONSTITUENTS OF CONCERN
FORMER SCOTT PAPER COMPANY MILL SITE

Chemicals	Site-Specific Sediment Cleanup Level[1]
Conventionals (%)	
Wood debris (by volume)	25[2]
Total volatile solids (by weight)	12.2[2]
Metals (mg/kg)	
Copper	390
Lead	450
Mercury	0.41
PCBs (mg/kg)	
Total PCBs	12 mg/kg OC
Total Petroleum Hydrocarbons (mg/kg)	
Diesel-Range	2,000
Heavy Oil-Range	2,000

Notes:

[1]Proposed cleanup levels are based on the SQS (Sediment Quality Standards - WAC 173-204-320).

[2]Wood debris and total volatile solids criteria based on site-specific bioassays completed during RI.

PCBs = Polychlorinated biphenyls

OC = Organic carbon

mg/kg = Milligrams per kilogram

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TABLE 4
SAMPLING AND ANALYTICAL TESTING PLAN - PHASES 1 & 2
FORMER SCOTT PAPER COMPANY MILL SITE

Sample Type	Metals									TCLP Metals				TPH							
	Antimony	Arsenic	Chromium (Total)	Copper	Lead	Mercury	Nickel	Thallium	Zinc	TCLP-Arsenic[1]	TCLP-Chromium[2]	TCLP-Lead[3]	TCLP-Mercury[4]	Diesel- and Heavy Oil-Range Hydrocarbons	PCBs	cPAHs	Dioxins/Furans	Wood Debris	Total Volatile Solids	Total Organic Carbon	Bioassay
Soil Stockpile Characterization Sampling																					
Phase 1																					
Initial Analysis - Overburden Stockpiles	x	x	x	x	x	x	x	x	x					x	x	x	x				
Potential Follow-Up Analysis - Overburden Stockpiles (see footnotes										x	x	x	x								
Phase 2																					
Initial Analysis - Overburden Stockpiles	x	x	x	x	x	x	x	x	x					x	x	x	x				
Potential Follow-Up Analysis - Overburden Stockpiles (see footnotes										x	x	x	x								
Initial Analysis - Suspected Dangerous Waste Stockpiles*		x	x	x	x	x															
Potential Follow-Up Analysis - Suspected Dangerous Waste Stockpiles* (see footnotes										x	x	x	x								
Remedial Excavation Soil Verification Sampling (Performance Monitoring)																					
Phase 1																					
Remedial Excavation Area 1				x	x				x							x					
Remedial Excavation Area 2		x																			
Remedial Excavation Area 3		x																			
Remedial Excavation Area 4																x					
Phase 2																					
Remedial Excavation Area 5				x	x				x					x		x	x				
Remedial Excavation Area 6				x					x								x				
Remedial Excavation Area 7																	x				
Remedial Excavation Area 8 (< 6 feet bgs)		x		x										x			x				
Remedial Excavation Area 8 (6-10 feet bgs)				x										x							
Remedial Excavation Area 9 (< 6 feet bgs)		x		x	x									x		x	x				
Remedial Excavation Area 9 (6-10 feet bgs)				x	x									x							
Remedial Excavation Area 10 (< 6 feet bgs)	x		x	x	x	x	x		x					x	x	x					
Remedial Excavation Area 10 (6-10 feet bgs)				x	x	x								x	x						
Remedial Excavation Area 11 (< 6 feet bgs)	x	x	x	x	x			x	x							x					
Remedial Excavation Area 11 (6-10 feet bgs)				x	x																
Remedial Excavation Area 12 (< 6 feet bgs)	x	x		x	x			x	x												
Remedial Excavation Area 12 (6-10 feet bgs)				x	x																
Remedial Excavation Area 13 (< 6 feet bgs)		x		x																	
Remedial Excavation Area 13 (6-10 feet bgs)				x																	
Dredge Area Sediment Verification Sampling (Performance Monitoring)																					
Phase 2				x	x	x								x	x			x	x	x	
Confirmational/Long-Term Monitoring																					
Groundwater Monitoring	x	x	x	x	x	x	x	x	x					x	x	x	x				
Subtidal Dredge Area (Long-Term) Sediment Monitoring				x	x	x								x	x			x	x	x	x

Notes:

[1]Run follow-up TCLP-arsenic analysis if total arsenic > 100 mg/kg (20x TCLP criterion).

[2]Run follow-up TCLP-chromium analysis if total chromium > 117 mg/kg (site-specific soil cleanup level for total chromium) or if other metals are being analyzed by TCLP and total chromium > 100 mg/kg (20x TCLP criterion).

[3]Run follow-up TCLP-lead analysis if total lead > 680 mg/kg (highest total lead result for the two Port Uplands Area samples that were analyzed for, and passed, TCLP-lead).

[4]Run follow-up TCLP-mercury analysis if total mercury > 4 mg/kg (20x TCLP criterion).

* Suspected dangerous waste stockpiles will be created for Remedial Excavation Areas 8 through 12.

TCLP = Toxicity Characteristic Leaching Procedure

TPH = Total petroleum hydrocarbons

PCBs = Polychlorinated biphenyls

cPAHs = Carcinogenic polycyclic aromatic hydrocarbons

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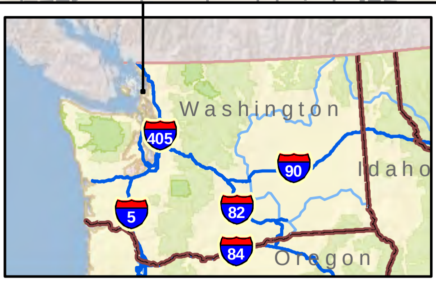

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2,000 0 2,000
Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps, Street Maps 2005

Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north

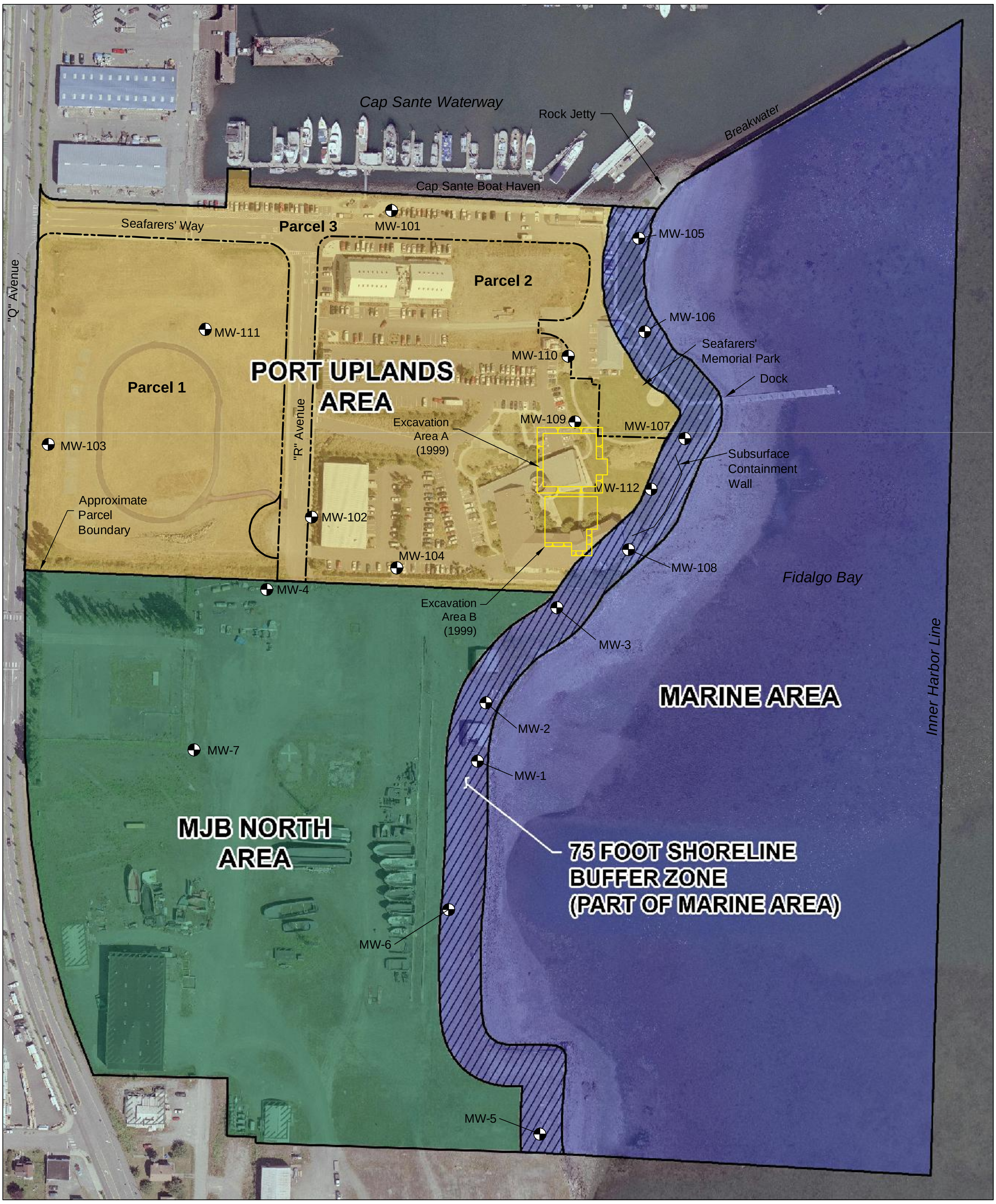
Vicinity Map

Scott Paper Mill
Anacortes, Washington

GEOENGINEERS

Figure 1

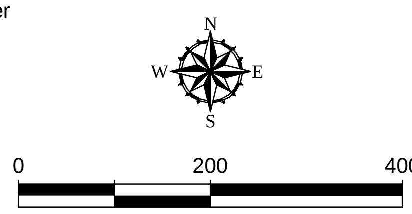
Office: SEA Path: P:\5\5147007\GIS\514700711 Fig1 VicinityMap.mxd KKS Map Revised: April 27, 2009



Source: AutoCAD figure provided by Landau Associates, dated September 2006. Base map source: David C. Smith and Associates, July 2004.

Legend

MW-111 Monitoring Well with Designation



Site Plan

Scott Paper Mill
Anacortes, Washington

Figure 2

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LEGEND

- Monitoring Well Location
- Push Probe Soil Sample Location
- Test Pit Sample Location
- Soil Sample Location
- Soil Boring Location
- Property Line
- Fence Line
- Proposed Security Fence
- Parking Area

Areas of Proposed Remedial Excavation

- Anticipated Limit of Excavation from 0 to 2' BGS
- Anticipated Limit of Excavation from 0 to 6' BGS
- Shoreline Buffer Zone Excavation
- **MJB4** Remedial Excavation Area Designation

NOTES

1. Extent of contaminated soil and estimated limits of remedial excavation are based on regulatory requirements and the existing chemical analytical for soil collected at the sample locations shown on the drawing.
2. Design documents are currently in development. Areas shown are not actual excavation limits for construction.
3. Excavation activities that extend deeper than 3-feet below ground surface will be monitored by an archeological resources specialist.
4. All monitoring wells located within excavation areas will be abandoned in accordance with WAC 173-160-381.

MJB NORTH AREA
REMEDIAL EXCAVATION AREAS
Anacortes, Washington

By: APS with AMEC Geomatrix	Date: 06/10/09	Figure 3

Plot Date: 06/10/09 - 3:35pm, Plotted by: dholmer
Drawing Path: K:\Jobs\000105-Kimberly Clark\000105-01\, Drawing Name: 00010501-82.dwg

APPENDIX A
DRAFT RESTRICTIVE COVENANTS

EXHIBIT - G

Model Restrictive (Environmental) Covenant

After Recording Return to:
____
Department of Ecology
[fill in regional address]

Environmental Covenant

Grantor: **[land owner]**
Grantee: State of Washington, Department of Ecology
Legal: **[fill in brief legal description]**
Tax Parcel Nos.: **[fill in]**
Cross Reference: **[if amendment, recording number of original covenant]**

Grantor, **_____[land owner]_______**, hereby binds Grantor, its successors and assigns to the land use restrictions identified herein and grants such other rights under this environmental covenant (hereafter "Covenant") made this day of **_____________**, 200**__** in favor of the State of Washington Department of Ecology (Ecology). Ecology shall have full right of enforcement of the rights conveyed under this Covenant pursuant to the Model Toxics Control Act, RCW 70.105D.030(1)(g), and the Uniform Environmental Covenants Act, 2007 Wash. Laws ch. 104, sec. 12.

This Declaration of Covenant is made pursuant to RCW 70.105D.030(1)(f) and (g) and WAC 173-340-440 by [NAME OF PROPERTY OWNER], its successors and assigns, and the State of Washington Department of Ecology, its successors and assigns (hereafter "Ecology").

A remedial action (hereafter "Remedial Action") occurred at the property that is the subject of this Covenant. The Remedial Action conducted at the property is described in the following document[s]:

[INSERT THE DATE AND TITLE FOR CLEANUP ACTION PLAN and other documents as applicable].

These documents are on file at Ecology's [Insert Office Location] Office.

+++++++Select the appropriate scenario for the property+++++++

SCENARIO 1:

This Covenant is required because the Remedial Action resulted in residual concentrations of [SPECIFICALLY LIST SUBSTANCE(S)] which exceed the Model Toxics Control Act Method [LIST APPLICABLE METHOD] Cleanup Level(s) for [SOIL, GROUNDWATER, ETC.] established under WAC 173-340-____.

++++and/or++++

SCENARIO 2:

This Restrictive Covenant is required because a conditional point of compliance has been established for [SOIL, GROUNDWATER, ETC.].SCENARIO 3:

If the Remedial Action does not fit within Scenarios 1 and/or 2 and you believe that the property still needs a Restrictive Covenant, contact the AG's office.

+++

The undersigned, [NAME OF PROPERTY OWNER], is the fee owner of real property (hereafter "Property") in the County of [NAME OF COUNTY], State of Washington, that is subject to this Covenant. The Property is legally described [AS FOLLOWS: (insert legal description language)] -or- [IN ATTACHMENT A OF THIS COVENANT AND MADE A PART HEREOF BY REFERENCE (attach document containing legal description)].

[NAME OF PROPERTY OWNER] makes the following declaration as to limitations, restrictions, and uses to which the Property may be put and specifies that such declarations shall constitute covenants to run with the land, as provided by law and shall be binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Property (hereafter "Owner").

Section 1. (This Section must describe with particularity the restrictions to be placed on the property.)

1. If the property was remediated to industrial soil cleanup standards, then use the following sentence: "The Property shall be used only for traditional industrial uses, as

described in RCW 70.105D.020(23) and defined in and allowed under the [CITY -or- COUNTY] of [________________'s] zoning regulations codified in the [OFFICIAL NAME OF ZONING REGULATION] as of the date of this Restrictive Covenant."

2. If the groundwater contains hazardous substances above cleanup levels, then use the following sentence: "No groundwater may be taken for [LIST THE PROHIBITED USES, E.G., DOMESTIC, AGRICULTURAL, OR ANY USE] from the Property."

3. If the soil contains hazardous substances above cleanup levels, then describe prohibited activities as follows:

a. For contaminated soil under a structure use the following sentence: "A portion of the Property contains [SPECIFICALLY LIST SUBSTANCE(S)] contaminated soil located [SPECIFICALLY DESCRIBE WHERE THE SOIL IS LOCATED, I.E., UNDER THE SOUTHEAST PORTION OF BUILDING 10]. The Owner shall not alter, modify, or remove the existing structure[s] in any manner that may result in the release or exposure to the environment of that contaminated soil or create a new exposure pathway without prior written approval from Ecology."

b. Example language for contaminated soil under a cap: "Any activity on the Property that may result in the release or exposure to the environment of the contaminated soil that was contained as part of the Remedial Action, or create a new exposure pathway, is prohibited. Some examples of activities that are prohibited in the capped areas include: drilling, digging, placement of any objects or use of any equipment which deforms or stresses the surface beyond its load bearing capability, piercing the surface with a rod, spike or similar item, bulldozing or earthwork."

Section 2. Any activity on the Property that may interfere with the integrity of the Remedial Action and continued protection of human health and the environment is prohibited.

Section 3. Any activity on the Property that may result in the release or exposure to the environment of a hazardous substance that remains on the Property as part of the Remedial Action, or create a new exposure pathway, is prohibited without prior written approval from Ecology.

Section 4. The Owner of the property must give thirty (30) day advance written notice to Ecology of the Owner's intent to convey any interest in the Property. No conveyance of title, easement, lease, or other interest in the Property shall be consummated by the Owner without adequate and complete provision for continued monitoring, operation, and maintenance of the Remedial Action.

Section 5. The Owner must restrict leases to uses and activities consistent with the Covenant and notify all lessees of the restrictions on the use of the Property.

Section 6. The Owner must notify and obtain approval from Ecology prior to any use of the Property that is inconsistent with the terms of this Covenant. Ecology may approve any inconsistent use only after public notice and comment.

Section 7. The Owner shall allow authorized representatives of Ecology the right to enter the Property at reasonable times for the purpose of evaluating the Remedial Action; to take samples, to inspect remedial actions conducted at the property, to determine compliance with this Covenant, and to inspect records that are related to the Remedial Action.

Section 8. The Owner of the Property reserves the right under WAC 173-340-440 to record an instrument that provides that this Covenant shall no longer limit use of the Property or be of any further force or effect. However, such an instrument may be recorded only if Ecology, after public notice and opportunity for comment, concurs.

[NAME OF GRANTOR]

____

[Name of Signatory]
[Title]

Dated: __________________

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

____

[Name of Person Acknowledging Receipt]
[Title]

Dated: __________________

[INDIVIDUAL ACKNOWLEDGMENT]

STATE OF ____________________
COUNTY OF __________________

On this ______ day of __________________, 20__, I certify that ______________ personally appeared before me, and acknowledged that **he/she** is the individual described herein and who executed the within and foregoing instrument and signed the same at **his/her** free and voluntary act and deed for the uses and purposes therein mentioned.

____
Notary Public in and for the State of Washington, residing at ______________.
My appointment expires______________.

[CORPORATE ACKNOWLEDGMENT]

STATE OF ____________________
COUNTY OF __________________

On this ______ day of __________________, 20__, I certify that ______________ personally appeared before me, acknowledged that **he/she** is the ____________________ of the corporation that executed the within and foregoing instrument, and signed said instrument by free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that **he/she** was authorized to execute said instrument for said corporation.

____
Notary Public in and for the State of Washington, residing at _______________.
My appointment expires_______________.

[REPRESENTATIVE ACKNOWLEDGEMENT]

STATE OF ____________________
COUNTY OF __________________

On this ______ day of __________________, 20__, I certify that ______________ ______ personally appeared before me, acknowledged that **he/she** signed this instrument, on oath stated that **he/she** was authorized to execute this instrument, and acknowledged it as the

___________________________ [type of authority] of _________________________ [name of party being represented] to be the free and voluntary act and deed of such party for the uses and purposes mentioned in the instrument.

____
Notary Public in and for the State of Washington, residing at ______________.
My appointment expires ______________.

Exhibit A
Legal Description

APPENDIX B
SITE HEALTH AND SAFETY PLAN

GEOENGINEERS, INC.

SITE HEALTH & SAFETY PLAN (HASP)

Former Scott Paper Mill Site

This HASP is to be used in conjunction with the GeoEngineers Safety Program Manual. Together, the written safety programs and this HASP constitute the site safety plan for this site. This plan is to be used by GeoEngineers personnel on this site and must be available on site. If the work entails potential exposures to other substances or unusual situations, additional safety and health information will be included and the plan will be approved by the GeoEngineers Health and Safety Manager. All plans are to be used in conjunction with current standards and policies outlined in the GeoEngineers Health and Safety Program Manual.

GENERAL PROJECT INFORMATION

Project Name:	Former Scott Paper Mill Site
Project Number:	5147-007-11
Type of Project:	Monitoring well abandonment (Phase 1, 2, and 4), cleanup action oversight (Phase 1, 2, and 4), excavation/dredging monitoring (Phase 1, 2, and 4), verification soil and sediment sampling (Phase 1, 2, and 4), monitoring well installation, development and sampling, long-term sediment and groundwater monitoring, long-term habitat monitoring (eelgrass survey), and long-term cap integrity monitoring (beach inspection, bathymetric survey).
Project Address:	R Avenue and Seafarers' Way, Anacortes, Washington
Start/Completion:	Summer 2009/Fall 2011 (or later)
Subcontractors:	Utility Locate Contractor Drilling Contractor Construction Contractors Analytical Contractors Survey Contractor

Liability Clause - This Site Safety Plan is intended for use by GeoEngineers employees only. It does not extend to the other contractors or subcontractors working on this site. If requested by subcontractors, this site safety plan may be used as a minimum guideline for those entities to develop safety plans or procedures for their own staff to work under. In this case, Form B-3 shall be signed by the subcontractor.

ORGANIZATION CHART

Chain of Command	Title	Name	Telephone Numbers
1	Project Manager	John Herzog	O: (206) 239-3252 C: (206) 406-6431
2	HAZWOPER Supervisor	Robert Trahan	O: (206) 239-3253 C: (206) 240-2300
3	Field Engineer/Geologist	Abhijit Joshi	O: (206) 239-3256 C: (425) 223-9028

Chain of Command	Title	Name	Telephone Numbers
4	Site Safety and Health Supervisor	Abhijit Joshi	See above
5	Client-Assigned Site Supervisor	Becky Darden	(360) 299-1818
6	Health and Safety Program Manager	Tony Orme	O: (425) 861-6000 C: (425) 922-2233
N/A	Subcontractor(s)	TBD	TBD
	Current Owner	Bob Elsner Becky Darden	(360) 299-1818

Site Safety and Health Supervisor -- The individual present at a hazardous waste site responsible to the employer and who has the authority and knowledge necessary to establish the site-specific health and safety plan and verify compliance with applicable safety and health requirements.

COMPREHENSIVE WORK PLAN

As described in the Engineering Design Report, the cleanup action will be divided into four phases of work (Phases 1 through 4). Following the cleanup action, long-term monitoring will be performed. These phases are described below.

Phase 1 Cleanup Action

- Coordinate a public utility locate (one-call) and a private utility locating company to mark underground utilities at the site.
- Observe abandonment of one monitoring well to be completed by a Washington-licensed driller.
- Relocation of utilities and construction of a lift station including the excavation of approximately 1,700 cubic yards (cy) of soil.
- Construction monitoring of remedial excavation with observations and field activities recorded in field notes/forms, chain-of-custody (COC) forms, etc.
    - Approximately 5,700 cy of soil will be excavated to depths of 6 to 10+ feet bgs at four inland remedial excavation areas, including approximately 2,400 cy of contaminated soil impacted by metals and cPAHs, and 3,300 cy of overburden soil assumed to be clean and suitable for reuse on site as backfill (to be confirmed by stockpile sampling).
- Collection of soil verification samples from the bottom and sidewalls of completed excavations for field screening and chemical analyses to guide the remedial excavation and evaluate the excavation limits for remaining chemical concentrations.
- Collection of stockpile soil samples for waste characterization and assessment of suitability for reuse on site as backfill.
- Collection of excavation water (if required) and truck/equipment wash water samples to determine if City of Anacortes discharge requirements are met.

- Excavated areas will be backfilled with clean soil. Excavated overburden soil will be reused on site as backfill if deemed suitable based on physical properties and stockpile sampling.
- Utilities, pavement/concrete surfaces, and landscaping interrupted or removed to facilitate soil excavation will be restored.
- Perform quality control monitoring and testing during the placement and compaction of backfill material.
- Construction monitoring of excavation and site restoration activities, with observations and field activities recorded in field notes/forms, COC forms, etc.

Phase 2 Cleanup Action

- Coordinate a public utility locate (one-call) and a private utility locating company to mark underground utilities at the site.
- Observe abandonment of up to six monitoring wells to be completed by a Washington-licensed driller.
- Contaminated soil removal at three inland remedial excavation areas within the Port Uplands Area; contaminated soil removal at six remedial excavation areas within the 75-foot wide shoreline buffer zone; and contaminated sediment and wood debris removal within the Marine Area.
    - Approximately 37,000 cy of soil will be excavated to depths of 1 to 15 feet bgs at three inland and six shoreline remedial excavation areas, including approximately 21,900 cy of contaminated soil and 15,100 cy of overburden soil assumed to be clean and suitable for reuse on site as backfill.
    - Approximately 47,000 cy of contaminated sediment, derelict timber piles, wood, and other debris will be removed by dredging or excavation within the Marine Area. The depth of removal will range from approximately 2 feet below the mudline in areas backfilled to grade, to approximately 3 feet below the mudline in areas where a multi-component cap will be placed to isolate contaminated sediment and wood debris left in place. Brick and derelict piles will be removed from these areas concurrent with the dredging/excavation.
- Some existing upland infrastructure, including utilities and paved surfaces, will be removed to allow better access to the contaminated soil and sediment in the area.
- Collection of soil and sediment verification samples from the bottom and sidewalls of completed excavations/dredge areas for field screening, chemical analyses, and/or bioassay/toxicity testing to guide the remedial excavation and evaluate the excavation limits for remaining chemical concentrations.
- The mixed dredged material will be stockpiled on site or transported to the Port's Pier 2 sediment handling facility for dewatering, removal of large timbers and other debris, and waste characterization sampling, if necessary, prior to transporting off site for disposal. The material that can be removed by excavation using land-based equipment will be stockpiled on site. The dredged material placed on a barge will require transport to the Pier 2 facility for stockpiling and handling. When the material has been dewatered, separated into like-waste streams (sediment, wood waste, and construction debris), and characterized (if necessary), the waste streams will be transported off site to a permitted disposal facility.

- Collection of stockpile soil samples for waste characterization and assessment of suitability for reuse on site as backfill.
- Collection of excavation water (if required) and truck/equipment wash water samples to determine if City of Anacortes discharge requirements are met.
- Excavated areas will be backfilled with clean soil. Excavated overburden soil will be reused on site as backfill if deemed suitable based on physical properties and stockpile sampling.
- Intertidal and subtidal dredged areas will be backfilled with clean imported sand and gravel selected to provide suitable substrate for aquatic organisms living in Fidalgo Bay. Shoreline capping materials will be placed to achieve proposed grade elevations, mitigate potential future erosion, and improve habitat conditions.
- Observe demolition, dredging, pile removal, and record field observations in field notes/forms, COC forms, etc.
- Observe construction of wave attenuation structures.
- Perform quality control monitoring and testing during the placement and compaction of backfill material.
- Construction monitoring of excavation and site restoration activities, with observations and field activities recorded in field notes/forms, COC forms, etc.

Phase 3 Cleanup Action

Phase 3 of the cleanup action will consist of final surface repairs/restoration and landscaping at the Port Uplands Area, and will involve little to no oversight by GeoEngineers.

Phase 4 Cleanup Action

Phase 4 of the cleanup action will consist of removing approximately 3,500 cy of contaminated shallow soil from remedial excavation areas within the inland portion of the MJB North Area (i.e., west of the 75-foot shoreline buffer zone). Based on the existing Site characterization data, these excavations are not anticipated to extend below 6 feet bgs. The Phase 4 design elements have not been finalized; consequently, this HASP does not cover Phase 4 work.

Post-Cleanup Action

- Installation of monitoring wells along the shoreline and farther inland by a Washington licensed driller.
- Monitoring well development and quarterly groundwater sample collection from site monitoring wells for the purposes of conformational/long-term monitoring to evaluate the long-term effectiveness of the cleanup action.
- Perform uplands cap integrity monitoring by observing and photo-documenting the uplands area cap during the quarterly groundwater monitoring events,
- Perform long-term sediment by collecting one or two rounds of post-construction sediment bioassay samples from the nearshore cap and offshore wood debris areas.
- Perform marine area cap integrity monitoring by inspecting beach and performing bathymetric survey.

- Perform shoreline/intertidal zone erosion monitoring by observing and photo documenting the shoreline restoration area during the quarterly groundwater monitoring events to note the condition of the beach substrate and plants.
- Long-term habitat recovery monitoring will be performed which will include eelgrass and biological monitoring.

LIST OF FIELD ACTIVITIES

Check the activities to be completed during the project

X Site reconnaissance
X Construction monitoring
X Surveying
X Monitor well abandonment/installation
X Monitor well development
X Soil sample collection
X Field screening of soil samples
X Sediment sample collection
X Field screening of sediment samples
X Groundwater sampling
X Groundwater depth and free product measurement
X Soil stockpile testing
X Dewatering treatment effluent testing
X Remedial excavation
X Remedial dredging
X Long-term soil/sediment cap integrity monitoring
X Eelgrass/Biological monitoring
____ Exploratory borings
____ Test pit exploration
____ Product sample collection
____ Vapor measurements
____ Remediation system monitoring
____ Recovery of free product

PERSONNEL TRAINING RECORDS

Name of Employee on Site	Level of HAZWOPER Training (24/40 hr)	Date of 8 Hr Refresher Training	Date of HAZWOPER Supervisor Training	First Aid/ CPR	Date of Other Trainings	Date of Respirator Fit Test
Abhijit Joshi	40 hr	4/3/08	--	3/11/08		--
Robert Trahan	40 hr	12/11/08	7/23/08	7/8/08		--
Rob Leet	40 hr	12/12/07	12/12/07	--		--
John Herzog	--	--	--	--		--
Chris Bailey	40 hr	12/12/07	12/12/07	3/11/08		--

EMERGENCY INFORMATION

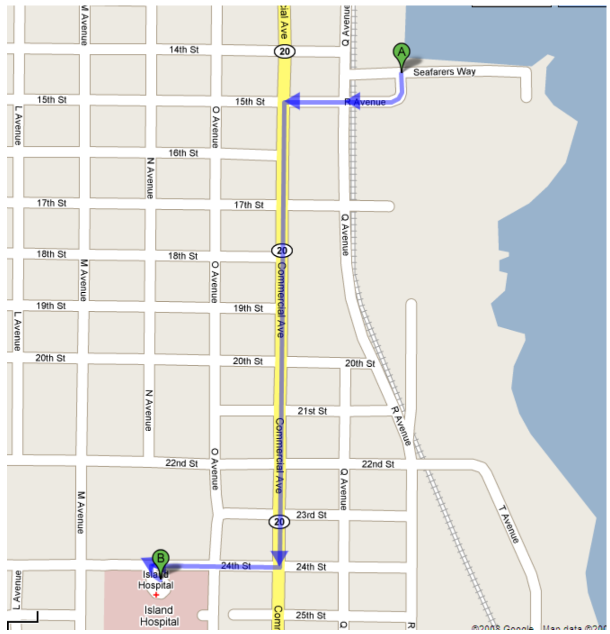
Hospital Name and Address: Island Hospital
1211 24th Street
Anacortes, Washington 98221

Phone Numbers (Hospital ER): Phone: (360) 468-3185

Distance: 0.8 miles

Route to Hospital:

1. Head south on R Avenue toward Q Avenue — 469 feet
2. Continue on 15th St — 351 feet
3. Turn left at Commercial Ave/WA-20-SPUR — 0.5 mi
4. Turn right at 24th St — 0.1 mi
5. Arrive at 1211 24th Street, Anacortes, WA (Island Hospital)



Ambulance: 9-1-1

Poison Control: Seattle (206) 253-2121; Other (800) 732-6985

Police: 9-1-1

Fire: 9-1-1

Location of Nearest Telephone: Cell phones are carried by field personnel.

Nearest Fire Extinguisher: Located in the GEI vehicle on site.

Nearest First-Aid Kit: Located in the GEI vehicle on site.

Standard Emergency Procedures

1. Get help -
   - send another worker to phone 911 (if necessary)
   - as soon as feasible, notify GeoEngineers' project manager
2. Reduce risk to injured person -
   - turn off equipment
   - move person from injury location (if possible)
   - keep person warm
   - perform CPR (if necessary)
3. Transport injured person to medical treatment facility (if necessary) -
   - by ambulance (if necessary) or GeoEngineers vehicle
   - stay with person at medical facility
   - keep GeoEngineers manager apprised of situation and notify human resources manager of situation

HAZARD ANALYSIS

Note: A hazard assessment will be completed at every site prior to beginning field activities. Updates will be included in the daily log. This list is a summary of hazards listed on the form.

PHYSICAL HAZARDS

X	Drill rigs and Concrete Coring, including working inside a warehouse
X	Backhoe
X	Trackhoe
	Crane
	Front End Loader
X	Excavations/trenching (1:1 slopes for Type B soil)
X	Shored/braced excavation if greater than 4 feet of depth
X	Overhead hazards/power lines
X	Tripping/puncture hazards (debris on-site, steep slopes or pits)
X	Overwater hazards
X	Street traffic
X	Heat/ Cold, Humidity
X	Utilities/ utility locate
X	Heavy Lifting
X	Pinch points
X	Sharp edges
X	Noise
X	Misc. Construction Equipment

- Utility check list completed—there may be site specific procedures for preventing drilling or digging into utilities. Add these procedures to the standard GeoEngineers utility check list.
- Work areas will be marked with reflective cones, barricades and/or caution tape. Personnel will wear high-visibility vests for increased visibility by vehicle and equipment operators.
- Field personnel will be aware constantly of the location and motion of heavy equipment. A safe distance will be maintained between personnel and the equipment. Personnel will be visible to the operator at all times and will remain out of the swing and/or direction of the equipment apparatus. Personnel will approach operating heavy equipment only when they are certain the operator has indicated it is safe to do so.
- Heavy equipment and/or vehicles used on this site will not work within 20 feet of overhead utility lines without first ensuring that the lines are not energized. This distance may be reduced to 10 feet depending on the client and the use of a safety watch.
- Excessive levels of noise (exceeding 85 dBA) are anticipated during construction, drilling and sheet pile installation. Personnel potentially exposed will wear ear plugs or muffs with a noise reduction rating (NRR) of at least 25 dB whenever it becomes difficult to carry on a conversation 6 feet away from a co-worker or whenever noise levels become bothersome. (Increasing the distance from the source will decrease the noise level noticeably.)
- Personnel entry into unshored or unsloped excavations deeper than 4 feet **is not allowed.** Any trenching and shoring requirements will follow guidelines established in WAC 296-155, the Washington State Construction standards or OSHA 1926.651 Excavation Requirements. In the

event that a worker is required to enter an excavation deeper than 4 feet, a trench box or other acceptable shoring will be employed or the side walls of the excavation will be sloped according to the soil type and guidelines as outlined in OSHA/DOSH regulations. If the shoring/sloping deviates from that outlined in the WAC, it will be designed and stamped by a PE. Prior to entry, personnel will conduct air monitoring as described later in this plan. All hazardous encumbrances and excavated material will be stockpiled at least 2 feet from the edge of a trench or open pit. If concentrations of volatile gases accumulate within an open trench or excavation, the means of entering shall adhere to confined space entry and air monitoring procedures outlined under the air monitoring recommendations in this plan and the GeoEngineers Safety Program Manual.

- Personnel will avoid tripping hazards, steep slopes, pit and other hazardous encumbrances. If it becomes necessary to work within 6 feet of the edge of a pit, slope, pier or other potentially hazardous area, appropriate fall protection measures will be implemented by the Site Safety and Health Supervisor in accordance with OSHA/DOSH regulations and the GeoEngineers Safety Program manual.
- Heat stress control measures must be implemented according to the GeoEngineers, Inc. program with water provided on site. See Additional Programs at end of this HASP.
- Boat use will follow the GeoEngineers, Inc. Work Boat Use Policy. All employees will wear Coast Guard approved life jackets and there will be an emergency kit with flares available in the boat. A cell phone will also be in the boat. Cross-Sound travel will be done only during daylight hours. The boat operator will be trained in safe boating practices.

Engineering Controls

____	Trench shoring (1:1 slope for Type B Soils)
X	Locate work spaces upwind/wind direction monitoring
X	Soil stockpile covers (as needed)
X	Other (specify)_______Dust control for metals exposure______________
____	

CHEMICAL HAZARDS (POTENTIALLY PRESENT AT SITE)

	Petroleum Products	
X	Diesel fuel	
X	Other petroleum products (list)	Motor Oil
	Organic Compounds	
X	Polychlorinated biphenyls.	
X	PAHs (polycyclic aromatic hydrocarbons)	
X	Other	Dioxins and furans
X	Other	Ammonia
X	Other	Hydrogen sulfide
	Metals	
X	Antimony	
X	Arsenic	
X	Cadmium	
X	Chromium	
X	Copper	

X	Lead
X	Mercury
X	Nickel
X	Thallium
X	Zinc

Summary of Chemical Hazards

Compound/ Description	Exposure Limits/IDLH[b]	Exposure Routes	Toxic Characteristics[d]
Diesel fuel	None established by OSHA, but ACGIH has adopted 100 mg/m^3 for a TWA (as total hydrocarbons)	Ingestion, inhalation, skin absorption, skin and eye contact	Irritated eyes, skin, and mucous membrane; fatigue; blurred vision; dizziness; slurred speech; confusion; convulsions; and headache, and dermatitis
Motor oil – may contain metals, gas, antifreeze and PAHs	Depends on the ancillary contaminants	Ingestion, inhalation, skin absorption, skin and eye contact	Depends on the ancillary contaminants.
PCBs (as Aroclor 1254)	PEL 0.5 mg/m^3 TLV 0.5 mg/m^3 REL 0.001 mg/m^3 IDLH 5.0 mg/m^3	Inhalation (dusts or mists), skin absorption, ingestion, skin and/or eye contact	Irritated eyes, chloracne, liver damage, reproductive effects, potential carcinogen
Polycyclic aromatic hydrocarbons (PAHs)	PEL 0.2 mg/m^3 TLV 0.2 mg/m^3 REL 0.1 mg/m^3 IDLH 80 mg/m^3	Inhalation, ingestion, skin and/or eye contact	Dermatitis, bronchitis, potential carcinogen
Dioxins/furans	See below	See below	See below
Ammonia	PEL 35 mg/m^3 REL 27 mg/m^3 IDLH 210 mg/m^3	Inhalation, ingestion (solution), skin and/or eye contact (solution/liquid)	Irritation eyes, nose, throat; dyspnea (breathing difficulty), wheezing, chest pain; pulmonary edema; pink frothy sputum; skin burns, vesiculation; liquid: frostbite.
Arsenic	PEL 0.01 mg/m^3 TLV 0.01 mg/m^3 Ceiling 0.002 mg/m^3 IDLH 5 mg/m^3	Inhalation, ingestion, skin and/or eye contact	Ulcerated nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, potential carcinogen
Chromium	PEL 1 mg/m^3 TLV 0.5 mg/m^3 REL 0.5 mg/m^3 IDLH 250 mg/m^3	Inhalation, ingestion, skin and/or eye contact	Chromium III is an essential nutrient, Chromium VI can cause irritation to nose, skin ulcers, linked to cancer.
Copper (dusts and mists)	PEL 1 mg/m3 TLV 1 mg/m3 REL 1 mg/m3 IDLH 100 mg/m3	Inhalation, ingestion, skin and/or eye contact	Irritated eyes and respiratory system, coughing, difficulty breathing, wheezing, potential carcinogen

Compound/ Description	Exposure Limits/IDLH[b]	Exposure Routes	Toxic Characteristics[d]
Lead (and inorganic compounds as lead)	PEL 0.05 mg/m3 TLV 0.05 mg/m3 REL 0.05 mg/m3 IDLH 100 mg/m3	Inhalation, ingestion, skin and/or eye contact	Lassitude (weakness, exhaustion), insomnia, facial pallor, anorexia, weight loss, malnutrition, constipation, abdominal pain, colic, anemia, gingival lead line, tremor, wrist and ankle paralysis, encephalopathy, kidney disease, irritated eyes, hypotension.
Mercury (and inorganic compounds as mercury)	PEL none TLV 0.025 mg/m^3 REL none Ceiling 0.1 mg/m^3 IDLH 10 mg/m^3	Inhalation, ingestion, skin and/or eye contact	Irritated eyes and skin, coughing, chest pain, difficulty breathing, bronchitis, pneumonitis, tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion), stomatitis, salivation, gastrointestinal disturbance, anorexia, weight loss, proteinuria.
Thallium	PEL 0.1 mg/m^3 REL 0.1 mg/m^3 IDLH 15 mg/m^3	Inhalation, ingestion, skin and/or eye contact	Nausea, diarrhea, abdominal pain, vomiting; ptosis, strabismus; peri neuritis, tremor; retrosternal (occurring behind the sternum) tightness, chest pain, pulmonary edema; convulsions, chorea, psychosis; liver, kidney damage; alopecia; paresthesia legs.
Zinc	TLV/PEL none Treat as particles not otherwise specified and maintain levels below 3 mg/m3 respirable and 10 mg/m3 inhalable	Inhalation	Metal fume fever (usually onsets at 77-600 mg zinc/ m3).

Compound/ Description	Exposure Limits/IDLH[b]	Exposure Routes	Toxic Characteristics[d]
Hydrogen Sulfide	OSHA PEL of 20 ppm or the ACGIH PEL of 10 ppm	Inhalation, skin and/or eye contact	Irritated eyes and skin, dermatitis, mucous membrane and respiratory tract irritant; pulmonary edema, which may be immediate or delayed, can occur after exposure to high concentrations. Symptoms of acute exposure include nausea, headaches, delirium, disturbed equilibrium, tremors, convulsions, and skin and eye irritation. Inhalation of high concentrations of hydrogen sulfide can produce extremely rapid unconsciousness and death. Exposure to the liquefied gas can cause frostbite injury.

The metals contaminants listed above present the greatest risk to site personnel through inhalation and ingestion of soil particles. Sediment sampling also found concentrations of heavy metals which could result in exposures close to the PEL if conditions are dry and dusty. The inhalation/ingestion hazards should be significantly mitigated by wet conditions while excavating contaminated soil.

PCBs

PCB is a generic term for a range of polychlorinated biphenyl compounds used commercially in heat transfer media and in the chemical/coatings industry. PCBs have been marketed commercially under the trade names Askarel® and Aroclor®, with a designation referring to the percent weight of chlorine. Prolonged skin contact with PCBs may cause acne-like symptoms, known as chloracne. Irritation to eyes, nose and throat may also occur. Acute and chronic exposure can cause liver damage, and symptoms of edema, jaundice, anorexia, nausea, abdominal pains and fatigue. If pregnant women accidentally ingest PCBs, stillbirth or infant skin and eye problems may occur. PCBs are a suspect human carcinogen. The EPA currently classifies PCBs as a Class B2, or probable, human carcinogen. The Washington State Permissible Exposure Limit (PEL)-Time Weighted Average (TWA) for PCBs with 54 percent chlorine content is 0.5 milligrams per cubic meter (mg/m^3), while the PEL-TWA for PCBs with 42 percent chlorine is 1 mg/m^3. Skin exposure may contribute significantly to uptake of these chemicals, and therefore all skin exposure to the liquid product or contaminated water, soil or dust should be strictly avoided.

Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)

Exposure to cPAHs can occur via inhalation of vapors, ingestion, and skin and eye contact. Skin contact can result in reddening or corrosion. Ingestion can cause nausea, vomiting, blood pressure fall, abdominal pain, convulsions and coma. Damage to the central nervous system can also occur. The U.S. Department of Health and Human Services (1989) has classified 15 PAHs compounds as having sufficient evidence for carcinogenicity, while the U.S. EPA (1990) has classified at least five of the identified PAHs as human carcinogens. There is no currently assigned PEL-TWA for cPAHs, but the closely related material coal tar is listed as coal tar pitch volatiles with a PEL-TWA of 0.2 mg/m^3.

PAHs and cPAHs as soil contaminants can be irritating to eyes and mucous membranes. PAHs are also formed during combustion and are linked to lung cancers with exposure to combustion byproducts. Lymphatic cancers are reported in the literature with PAHs in the presence of carbon black.

Dioxins/Furans

Generally, dioxin exposures to humans are associated with increased risk of severe skin lesions such as chloracne and hyperpigmentation, altered liver function and lipid metabolism, general weakness associated with drastic weight loss, changes in activities of various liver enzymes, depression of the immune system, and endocrine- and nervous-system abnormalities. It is a potent teratogenic and fetotoxic chemical in animals. A very potent promoter in rat liver cancers, 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) causes cancers of the liver and other organs in animals. Populations occupationally or accidentally exposed to chemicals contaminated with dioxin have increased incidences of soft-tissue sarcoma and non-Hodgkin's lymphoma.

Dioxin-contaminated soil may result in dioxins occurring in a food chain. This is especially important for the general population. It has been estimated that about 98 % of exposure to dioxins is through the oral route. Exposure as a vapor is normally negligible because of the low vapor pressure typical of these compounds. In the 1980s, a concentration level of 1 ppb 2,3,7,8-TCDD in soil was specified as "a level of concern," based on cancer effects. However, recent studies indicate that end points other than cancer (such as those listed above) are also of concern based on a projected intake from 1 ppb 2,3,7,8-TCDD in soil.

Human studies have shown alteration in delayed-type hypersensitivity after exposure to dioxins. NIOSH recommends respiratory protection at the “lowest feasible level.”

Very little human toxicity data from exposure to tetrachlorodibenzodioxins (TCDDs) and/or polychlorinated dibenzodioxins (PCDDs) are available. Health-effect data obtained from occupational settings in humans are based on exposure to chemicals contaminated with dioxins. It produces a variety of toxic effects in animals and is considered one of the most toxic chemicals known. Most of the available toxicity data are from high-dose oral exposures to animals (including tumor production, immunological dysfunction, and teratogenesis). Very little dermal and inhalation exposure data are available in the literature. It is important for field personnel to remember that although dioxins are toxic and carcinogenic, most of the information is based on exposure to high doses of liquid product. These products are not very volatile, so the major concern is on skin protection and inhalation/ingestion of soil particles. The American Conference of Governmental Industrial Hygienists (ACGIH) recommends a 20 ppm threshold limit value (TLV) for 1,4-dioxane (an example of numerous dioxin compounds), lists it as being absorbed through the skin, and lists it as potentially carcinogenic as well as toxic to liver and kidneys. This is typical of health effects for dioxin/furan compounds. Care should be taken especially in sampling product from drums and wells known to contain detectable levels of dioxins. Emphasis will be on working outside in well-ventilated areas using proper PPE (as discussed later in this plan). There is significant variability in dioxin lethality in animals. The signs and symptoms of dioxin poisoning in humans, however, are analogous to those observed in animals.

Mercury

Mercury is a neurotoxic substance that can produce a wide range of health effects depending on the amount and timing of exposure. Mercury is a liquid at room temperature but vaporizes readily; in vapor form it is readily absorbed through the lungs. Repeated exposures to low levels of mercury vapor over long periods have been associated with tremors, irritability, impulsiveness, drowsiness, impaired memory, and sleep disturbances. These effects may occur at lower levels of exposure in children than adults.

When mercury attaches to an organic molecule, it may be absorbed into the body through the digestive tract. Methyl-mercury, which is produced naturally by certain bacteria, is such a molecule. It can cross the placenta and enter the brain, causing severe brain damage in fetuses. High mercury levels in fish consumed by pregnant women have been linked to severe brain damage and cerebral palsy in newborns. For more information: http://www.ilpi.com/safety/mercury.html

Hydrogen Sulfide

Hydrogen sulfide is a colorless, flammable, highly toxic gas. It is shipped as a liquefied, compressed gas. It has a characteristic rotten-egg odor that is detectable at concentrations as low as 0.5 ppb. Inhalation is the major route of hydrogen sulfide exposure. The gas is rapidly absorbed by the lungs. The odor threshold (0.5 ppb) is much lower than the OSHA PEL of 20 ppm or the ACGIH PEL of 10 ppm. However, although its strong odor is readily identified, olfactory fatigue occurs at high concentrations and at continuous low concentrations. For this reason, **odor is not a reliable indicator of hydrogen sulfide's presence and may not provide adequate warning of hazardous concentrations**. Hydrogen sulfide is slightly **heavier** than air and may accumulate in enclosed, poorly ventilated, and low-lying areas. Prolonged exposure to hydrogen sulfide, even at relatively low levels, may result in painful dermatitis and burning eyes. Direct contact with the liquefied gas can cause frostbite. Absorption through intact skin is minimal.

Hydrogen sulfide is produced naturally by decaying organic matter and is released from sewage sludge, liquid manure, sulfur hot springs, and natural gas. It is a by-product of many industrial processes including petroleum refining, tanning, mining, wood- pulp-processing, rayon manufacturing, sugar-beet processing, and hot-asphalt paving. Hydrogen sulfide is used to produce elemental sulfur, sulfuric acid, and heavy water for nuclear reactors.

Hydrogen sulfide is a mucous membrane and respiratory tract irritant; pulmonary edema, which may be immediate or delayed, can occur after exposure to high concentrations. Symptoms of acute exposure include nausea, headaches, delirium, disturbed equilibrium, tremors, convulsions, and skin and eye irritation.

Inhalation of high concentrations of hydrogen sulfide can produce extremely rapid unconsciousness and death. Exposure to the liquefied gas can cause frostbite injury.

Respiratory Protection: Positive-pressure, self-contained breathing apparatus (SCBA) is recommended in response situations that involve exposure to potentially unsafe levels of hydrogen sulfide.

Skin Protection: Chemical-protective clothing is not generally required because hydrogen sulfide gas is not absorbed through the skin, and skin irritation is rare. Direct contact with the liquefied gas can cause frostbite.

Rescuers should have a safety line during rescue operations because of the extremely rapid toxic action of hydrogen sulfide.

Prolonged exposure to hydrogen sulfide, even at relatively low levels, may result in painful dermatitis and burning eyes. Direct contact with the liquefied gas can cause frostbite. Absorption through intact skin is minimal.

Hydrogen sulfide is produced naturally by decaying organic matter and is released from sewage sludge, liquid manure, sulfur hot springs, and natural gas. It is a by-product of many industrial processes including petroleum refining, tanning, mining, wood-pulp.

BIOLOGICAL HAZARDS AND PROCEDURES

Y/N	Hazard	Procedures
________	Poison Ivy or other vegetation	________
________	Insects or snakes	________
________	Used hypodermic needles or other infectious hazards	**Do not pick up or contact**
________	Others	________

Site personnel shall avoid contact with or exposures to potential biological hazards encountered.

ADDITIONAL HAZARDS (UPDATE IN DAILY LOG)

Include evaluation of:

- *Physical Hazards* (excavations and shoring, equipment, traffic, tripping, heat stress, cold stress and others).
- *Chemical Hazards* (odors, spills, free product, airborne particulates and others present).
- *Biological Hazards* (snakes, spiders, other animals, discarded needles, poison ivy and others present).

AIR MONITORING PLAN

Work upwind if at all possible.

Check instrumentation to be used:

______ TLV Monitor (flammability only, for methane and petroleum vapors)
__X__ PID (Photoionization Detector)
__X__ Other (i.e., detector tubes): Gas meter (for hydrogen sulfide monitoring)

Check monitoring frequency/locations: and type (specify: work space, borehole, breathing zone):

______ 15 minutes - Continuous during soil disturbance activities or handling samples
______ 15 minutes
______ 30 minutes
__X__ Hourly (in breathing zone during soil excavation, drilling, sampling)

Additional personal air monitoring for specific chemical exposure:

Dust/ Metals

If drilling or excavation activities generate visible dust, the SSO will be notified immediately to assess the need for air monitoring and lab analysis for inhalable and respirable particulates.

Dioxins and Furans

There are no established PELs for dioxins and furans, thus the emphasis will be working in well-ventilated areas with protective equipment used during sampling and other activities. In areas where dioxins have been found or while sampling product known or suspected to contain dioxin, personnel will wear respirators with combination HEPA (P100)/organic vapor respirators or equivalent**.** Dioxins are not listed to have an ionization potential (IP) so the PID will not be used as a method of detection. Respiratory protection shall be used whenever working in areas known or suspected to contain dioxins or furans.

PAHs
For napthalenes and polycyclic aromatic hydrocarbons, if PID monitoring indicates levels greater than 10 ppm over background for 5 minutes in the breathing zone, personnel shall upgrade to respirators with combination HEPA/organic vapor filters. Site personnel will wear respirators while doing any soil or product disturbance or sampling if there is dust or if there are odors. Naphthalene will be detected by the PID and has a distinct mothball smell.

Action levels:

- The workspace will be monitored using a photoionization detector (PID). These instruments must be properly maintained, calibrated and charged (refer to the instrument manuals for details). Zero this meter in the same relative humidity as the area it will be used in and allow at least a 10-minute warm-up prior to zeroing. Do not zero in a contaminated area. The PID can be tuned to read chemicals specifically if there are not multiple contaminants on site. It can be tuned to detect one chemical with response factor entered into the equipment, but the PID picks up all volatile organic compounds (VOCs) present. Ionization potential (IP) of chemical has to be less than lamp (11.7/ 10.6eV) and PID does not detect methane. The ppm readout on the instrument is relative to the IP of isobutylene (calibration gas), so conversion must be made in order to estimate ppm of the chemical on-site.
- An initial vapor measurement survey of the site should be conducted to detect "hot spots" if contaminated soil is exposed at the surface. Vapor measurement surveys of the workspace should be conducted at least hourly or more often if persistent petroleum-related odors are detected. Additionally, if vapor concentrations exceed 5 ppm above background continuously for a 5-minute period as measured in the breathing zone, upgrade to Level C PPE or move to a noncontaminated area.
- Standard industrial hygiene/safety procedure is to require that action be taken to reduce worker exposure to organic vapors when vapor concentrations exceed ½ the TLV. Because of the variety of chemicals, the PID will not indicate exposure to a specific PEL and is therefore not a preferred tool for determining worker exposure to chemicals. If odors are detected, then employees will upgrade to respirator with Organic Vapor cartridges and will contact the Health and Safety Program Manager for other sampling options.

Air Monitoring Action Levels

Contaminant	Activity	Monitoring Device	Frequency of Monitoring Breathing Zone	Action Level	Action
Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes and in event of odors	Background to 5 parts per million (ppm) in breathing zone	Use Level D or Modified Level D PPE.
Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes and in event of odors	5 to 25 ppm in breathing zone	Upgrade to Level C PPE.

Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes	> 25 ppm in breathing zone	Stop work and evacuate the area. Contact Certified Industrial Hygienist (CIH) for guidance.
Combustible Atmosphere	Environmental Remedial Actions	PID/TLV	Start of shift; prior to excavation entry; every 30 to 60 minutes	<10% LEL or <1000 ppm	Depends on contaminant. The PEL is usually exceeded before the LEL.
Combustible Atmosphere	Environmental Remedial Actions	PID/TLV Or 4 gas meter	Start of shift; prior to excavation entry; every 30 to 60 minutes	>10% LEL or >1000 ppm	Stop work and evacuate the site. Contact CIH for guidance.
Oxygen Deficient/Enriched Atmosphere	Environmental Remedial Actions Confined Spaces	Oxygen meter Or 4 gas meter	Start of shift; prior to excavation entry; every 30 to 60 minutes	>19.5 <23.5%	Continue work if inside range. If outside range, exit area and contact CIH.

SITE CONTROL PLAN

Site control elements are included in the Engineering Design Report. The site control plan has been developed to minimize employee exposure to hazardous substances and includes the following.

Several site maps are included with the Engineering Design Report. The hospital route map is included with this HASP.

TRAFFIC OR VEHICLE ACCESS CONTROL PLANS

Traffic and vehicle access control plans are included in the Port Contract Documents. Traffic will be controlled by the contractor with the help of road work signs and cones.

SITE WORK ZONES

Site work zones (Construction Staging Areas, Soil stockpiling areas, and Excavation Water Detention Areas) are demarcated on in the Port Contract Documents. In general, hot zones/exclusion zones will be located around each excavation.

Hot zone/exclusion zone (Define and indicate on site map):

	Method of delineation/ excluding non-site personnel
X	Fence
	Survey Tape
X	Traffic Cones
X	Other Road Work Signs

BUDDY SYSTEM

Personnel on-site should use the buddy system (pairs), particularly whenever communication is restricted. If only one GeoEngineers employee is on-site, a buddy system can be arranged with subcontractor/contractor personnel.

SITE COMMUNICATION PLAN

Positive communications (within sight and hearing distance or via radio) should be maintained between pairs on-site, with the pair remaining in proximity to assist each other in case of emergencies. The team should prearrange hand signals or other emergency signals for communication when voice communication becomes impaired (including cases of lack of radios or radio breakdown). In these instances, you should consider suspending work until communication can be restored; if not, the following are some examples for communication:

- Hand gripping throat: Out of air, can't breathe.
- Gripping partner's wrist or placing both hands around waist: Leave area immediately, no debate.
- Hands on top of head: Need assistance.
- Thumbs up: Okay, I'm all right, or I understand.
- Thumbs down: No, negative.

DECONTAMINATION PROCEDURES

Decontamination consists of removing outer protective tyvek clothing and washing soiled boots and then be removed, and respirator, hands and face will be washed in either a portable wash station or a bathroom facility in the support zone. Employees will perform decontamination procedures and wash.

Specify other site specific decontamination procedures:

WASTE DISPOSAL OR STORAGE

PPE disposal (specify): Disposable PPE (gloves) will be placed into plastic trash bags and disposed as solid waste.

Drill cutting/purge water/excavated soil & sediment disposal or storage:

_____ On-site, pending analysis and further action
__x__ Secured (list method) Drums
__x__ Other (describe destination, responsible parties): Stockpiling, landfill disposal as described in EDR

PERSONAL PROTECTIVE EQUIPMENT

PPE will consist of standard Level D equipment.

Air monitoring will be conducted for flammable vapors and for establishing the level of respiratory protection.

- Level D PPE will be worn at all times on site. Potentially exposed personnel will wash gloves, hands, face, and other pertinent items to prevent hand-to-mouth contact. This will be done prior to hand-to-mouth activities including eating, smoking, etc. Adequate personnel and equipment decontamination will be used to decrease potential ingestion and inhalation. Individual PELs or action limits are not expected to be exceeded given the planned activities. If there are waste oil contaminants in the soil and conditions are damp, airborne dust is not likely to be an issue. If conditions are dry and dust is visible during site activities, personnel will use P100 cartridges on their respirators.

Personal Protective Equipment (PPE). Minimum level of protective equipment for these sites is Level D. After the initial and/or daily hazard assessment has been completed, select the appropriate protective gear (PPE) to preserve worker safety. Task-specific levels of PPE shall be reviewed with field personnel during the pre-work briefing conducted prior to the start of site operations.

Check applicable personal protection gear to be used:

__X__ Hardhat
__X__ Steel-toed boots
__X__ Safety glasses
__X__ Hearing protection (if it is difficult to carry on a conversation 3 feet away)
__X__ Rubber boots (if wet conditions)
__X__ Lifejackets (for near/over water work)

Gloves (specify):

__X__ Nitrile
_____ Latex
_____ Liners
_____ Leather
_____ Other (specify) ____________________

Protective clothing:

__X__ Tyvek (if dry conditions are encountered, Tyvek is sufficient)
_____ Saranex (personnel shall use Saranex if liquids are handled or splash may be an issue)
__X__ Cotton
__X__ Rain gear (as needed)
__X__ Layered warm clothing (as needed)

Inhalation hazard protection:

__X__ Level D
_____ Level C (respirators with organic vapor filters/ P100 filters)

Limitations of Protective Clothing

PPE clothing ensembles designated for use during site activities shall be selected to provide protection against known or anticipated hazards. However, no protective garment, glove, or boot is entirely chemical-resistant, nor does any PPE provide protection against all types of hazards. To obtain optimum performance from PPE, site personnel shall be trained in the proper use and inspection of PPE. This training shall include the following:

- Inspect PPE before and during use for imperfect seams, non-uniform coatings, tears, poorly functioning closures, or other defects. If the integrity of the PPE is compromised in any manner, proceed to the contamination reduction zone and replace the PPE.
- Inspect PPE during use for visible signs of chemical permeation such as swelling, discoloration, stiffness, brittleness, cracks, tears, or other signs of punctures. If the integrity of the PPE is compromised in any manner, proceed to the contamination reduction zone and replace the PPE.
- Disposable PPE should not be reused after breaks unless it has been properly decontaminated.

Respirator Selection, Use, and Maintenance

GeoEngineers has developed a written respiratory protection program in compliance with OSHA requirements contained in 29 CFR 1910.134. Site personnel shall be trained on the proper use, maintenance, and limitations of respirators. Site personnel that are required to wear respiratory protection shall be medically qualified to wear respiratory protection in accordance with 29 CFR 1910.134. Site personnel that will use a tight-fitting respirator must have passed a qualitative or quantitative fit test conducted in accordance with an OSHA-accepted fit test protocol. Fit testing must be repeated annually or whenever a new type of respirator is used. Respirators will be stored in a protective container.

Respirator Cartridges

If site personnel are required to wear air-purifying respirators, the appropriate cartridges shall be selected to protect personnel from known or anticipated site contaminants. The respirator/cartridge combination shall be certified and approved by NIOSH. A cartridge change-out schedule shall be developed based on known site contaminants, anticipated contaminant concentrations, and data supplied by the cartridge manufacturer related to the absorption capacity of the cartridge for specific contaminants. Site personnel shall be made aware of the cartridge change-out schedule prior to the initiation of site activities. Site personnel shall also be instructed to change respirator cartridges if they detect increased resistance during inhalation or detect vapor breakthrough by smell, taste, or feel although breakthrough is not an acceptable method of determining the change-out schedule. At a minimum, cartridges should be changed a minimum of once daily.

Respirator Inspection and Cleaning

The Site Safety and Health Supervisor shall periodically (i.e., weekly) inspect respirators at the project site. Site personnel shall inspect respirators prior to each use in accordance with the manufacturer’s instructions. In addition, site personnel wearing a tight-fitting respirator shall perform a positive and negative pressure user seal check each time the respirator is donned to ensure proper fit and function. User seal checks shall be performed in accordance with the GeoEngineers respiratory protection program or the respirator manufacturer’s instructions.

ADDITIONAL ELEMENTS

HEAT STRESS PREVENTION

List all the site specific procedures for preventing heat stress.

The State of Washington has regulations that provide specific requirements for handling employee exposure to heat stress. GeoEngineers’ program complies with both sets of requirements and will be implemented in all areas where heat stress is identified as a potential health issue.

The Washington State requirements for preventing heat stress apply to outdoor work environments from May 1 through September 30, annually, only when employees are exposed to outdoor heat at or above an applicable temperature listed in Table 1. To determine which temperature applies to each worksite, select the temperature associated with the general type of clothing or personal protective equipment (PPE) each employee is required to wear.

Table 1. Outdoor Temperature Action Levels

All other clothing	89°
Double-layer woven clothes including coveralls, jackets and sweatshirts	77°

Nonbreathing clothes including vapor barrier clothing or PPE such as chemical resistant suits	52°

Keeping workers hydrated in a hot outdoor environment requires more water be provided than at other times of the year. GeoEngineers is prepared to supply at least one quart of drinking water per employee per hour. When employee exposure is at or above an applicable temperature listed in Table 1, Project Managers will ensure that:

- A sufficient quantity of drinking water is readily accessible to employees at all times; and
- All employees have the opportunity to drink at least one quart of drinking water per hour.

EMERGENCY RESPONSE

Indicate what site specific procedures you will implement.

- Personnel on-site should use the "buddy system" (pairs).
- Visual contact should be maintained between "pairs" on-site, with the team remaining in proximity to assist each other in case of emergencies.
- If any member of the field crew experiences any adverse exposure symptoms while on-site, the entire field crew should immediately halt work and act according to the instructions provided by the SSO.
- Wind indicators visible to all on-site personnel should be provided by the SSO to indicate possible routes for upwind escape. Alternatively, the SSO may ask on-site personnel to observe the wind direction periodically during site activities.
- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated should result in the evacuation of the field team, contact of the PM, and reevaluation of the hazard and the level of protection required.
- If an accident occurs, the SSO and the injured person are to complete, within 24 hours, an Accident Report for submittal to the PM, the HSM and HR. The PM should ensure that follow-up action is taken to correct the situation that caused the accident or exposure.

A SAMPLING AND MONITORING PLAN FOR DRUMS AND CONTAINERS

Sampling of dewatering containers and stockpiles is discussed in the EDR.

SITE CONTROL MEASURES

Site control measures are listed above in Site Control Plan.

SPILL CONTAINMENT PLANS (DRUM AND CONTAINER HANDLING)

The contractor will be responsible for spill containment.

STANDARD OPERATING PROCEDURES FOR SAMPLING, MANAGING, AND HANDLING DRUMS AND CONTAINERS

Drums and containers used during the cleanup shall meet the appropriate Department of Transportation (DOT), OSHA and U.S. Environmental Protection Agency (EPA) regulations for the waste that they contain. Site operations shall be organized to minimize the amount of drum or container movement. When practicable, drums and containers shall be inspected and their integrity shall be ensured before they are moved. Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled. Before drums or containers are moved, all employees involved in the transfer operation shall be warned of the potential hazards associated with the contents.

Drums or containers and suitable quantities of proper absorbent shall be kept available and used where spills, leaks or rupture may occur. Where major spills may occur, a spill containment program shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred. Fire extinguishing equipment shall be on hand and ready for use to control incipient fires.

ENTRY PROCEDURES FOR TANKS OR VAULTS (CONFINED SPACES)

GeoEngineers employees will not be entering confined spaces to perform work unless they have been trained in the classroom and with hands-on experience with retrieval equipment. If a project requires confined space entry, please include a copy of the confined space permit and include the training documentation in this HASP.

Trenches greater than 4 ft in depth with the potential for build-up of a hazardous atmosphere are considered confined spaces.

PERSONNEL MEDICAL SURVEILLANCE

GeoEngineers' employees are not in a medical surveillance program as they do not fall into the category of "Employees Covered" in OSHA 1910.120(f)(2) which states a medical surveillance program is required for the following employees:

1. All employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year;
2. All employees who wear a respirator for 30 days or more a year or as required by state and federal regulations; and
3. All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation; and
4. Members of HAZMAT teams.

SANITATION

Washrooms are present in on-site buildings.

LIGHTING

Field work will be conducted during daylight hours; if at dusk, street lights are present.

EXCAVATION, TRENCHING AND SHORING

All employees working on project sites where there is an excavation greater than 4 feet in depth will be trained in excavation safety and will utilize safe procedures. OSHA designates a 5 foot depth for instituting excavation safety procedures; however GeoEngineers will use the most conservative depth of 4 feet as specified by states such as Washington, Oregon, and California. This program is for the protection of employees while working in excavations; however employees should not enter excavations if there is an alternative.

GeoEngineers employees often do not have stop work authority on projects controlled by other contractors, however any GeoEngineers employee, regardless of job title, working in the field will be responsible for contacting the Project Manager if they observe practices on the job site that are serious safety violations that are not under their control. They will document the unsafe practices and will contact the site safety coordinator as identified by the client. If no one is on site, the Project Manager, once notified, will contact the client. This action establishes GeoEngineers commitment to site health and safety on all job sites as our duty of care to the public, contractors, and clients.

GeoEngineers is responsible for its subcontractors and will also be providing inspections and corrections of any work that subcontractors perform around excavations.

OTHER PROGRAMS

None.

DOCUMENTATION TO BE COMPLETED FOR HAZWOPER PROJECTS

NOTE: The Field Log is to contain the following information:

Updates on hazard assessments, field decisions, conversations with subs, client or other parties.
Air monitoring/calibration results; personnel, locations monitored, activity at the time of monitoring
Actions taken
Action level for upgrading PPE and rationale
Meteorological conditions (temperature, wind direction, wind speed, humidity, rain, snow, etc.).

Required forms:

Field Log
Health and Safety Plan acknowledgment by GEI employees (Form B-2)
Contractors Health and Safety Plan Disclaimer (Form B-3)
Conditional forms available at GeoEngineers office: Accident Report

APPROVALS

1.	Plan Prepared	Victoria England/Zanna Satterwhite Signature	5/21/09 Date
2.	Plan Approval	John Herzog PM Signature	 Date
3.	Health & Safety Officer	Tony Orme Health & Safety Program Manager	 Date

FORM B-1
HEALTH AND SAFETY PRE-ENTRY BRIEFING
PORT OF ANACORTES - FORMER SCOTT PAPER MILL SITE
5147-007-11

Inform employees, contractors, and subcontractors or their representatives about:

- The nature, level, and degree of exposure to hazardous substances they're likely to encounter, all site-related emergency response procedures, any identified potential fire, explosion, health, safety, or other hazards.

Conduct briefings for employees, contractors, and subcontractors, or their representatives as follows:

- A pre-entry briefing before any site activity is started.
- Additional briefings, as needed, to make sure that the site-specific HASP is followed.
- Make sure all employees working on the site are: Informed of any risks identified and trained on how to protect themselves and other workers against the site hazards and risks

Update all information to reflect current sight activities and hazards.

All personnel participating in this project must receive initial health and safety orientation. Thereafter, brief tailgate safety meetings will be held as deemed necessary by the Site Safety and Health Supervisor.

The orientation and the tailgate safety meetings shall include a discussion of emergency response, site communications and site hazards.

Date	Topics	Attendee	Company Name	Employee Initials

FORM B-2
SITE SAFETY PLAN – GEOENGINEERS' EMPLOYEE ACKNOWLEDGMENT

PORT OF ANACORTES - FORMER SCOTT PAPER MILL SITE
5147-007-11

(All GeoEngineers' site workers complete this form, which should remain attached to the safety plan and filed with other project documentation).

I, ____, do hereby verify that a copy of the current Safety Plan has been provided by GeoEngineers, Inc., for my review and personal use. I have read the document completely and acknowledge a full understanding of the safety procedures and protocol for my responsibilities on site. I agree to comply with all required, specified safety regulations and procedures. I understand that I will be informed immediately of any changes that would affect site personnel safety.

Signed ______________________________ Date ______________________

Range of Dates From: ______________________________
To: ______________________________

Signed ______________________________ Date ______________________

Range of Dates From: ______________________________
To: ______________________________

Signed ______________________________ Date ______________________

Range of Dates From: ______________________________
To: ______________________________

Signed ______________________________ Date ______________________

FORM B-3
SUBCONTRACTOR AND SITE VISITOR SITE SAFETY FORM

PORT OF ANACORTES - FORMER SCOTT PAPER MILL SITE
5147-007-11

I, ____, verify that a copy of the current site Safety Plan has been provided by GeoEngineers, Inc. to inform me of the hazardous substances on site and to provide safety procedures and protocols that will be used by GeoEngineers' staff at the site. By signing below, I agree that the safety of my employees is the responsibility of the undersigned company.

Signed ____________________________ Date ____________________

Firm: ____

Signed ____________________________ Date ____________________

Firm: ____

Signed ____________________________ Date ____________________

Firm: ____

Signed ____________________________ Date ____________________

Firm: ____

Signed ____________________________ Date ____________________

Firm: ____

Signed ____________________________ Date ____________________

Firm: ____

APPENDIX C
QUALITY ASSURANCE PROJECT PLAN

APPENDIX C
QUALITY ASSURANCE PROJECT PLAN
FORMER SCOTT PAPER COMPANY MILL SITE

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Tables

APPENDIX C
QUALITY ASSURANCE PROJECT PLAN
FORMER SCOTT PAPER COMPANY MILL SITE

This Quality Assurance Project Plan (QAPP) was developed for environmental sampling and compliance monitoring activities at the former Scott Paper Company Mill Site (the "Site"). Cleanup activities are being conducted by the Port of Anacortes (the "Port") to satisfy requirements of a Consent Decree for the Site. Objectives of the cleanup action are discussed, and planned sampling and monitoring activities are outlined, in the main sections of the Engineering Design Report (EDR). The QAPP serves as the primary guide for the integration of quality assurance (QA) and quality control (QC) functions into sampling activities. The QAPP presents the objectives, procedures, organization, functional activities, and specific QA/QC activities designed to achieve data quality objectives for the project. This QAPP is based on guidelines in Washington Administrative Code (WAC) 173-340-820; WAC 173-204; the Puget Sound Estuary Program (PSEP) protocols (1996); and Washington Department of Ecology's (Ecology's) Sediment Sampling and Analysis Plan Appendix (SAPA; Ecology 2008).

Throughout the project, environmental measurements will be conducted to produce data that meet established objectives and that are scientifically valid and of known and acceptable quality. QA/QC procedures will be implemented so that the precision, accuracy, representativeness, completeness, and comparability of the data generated meet data quality objectives for the project.

1.0 PROJECT ORGANIZATION AND RESPONSIBILITY

Descriptions of the responsibilities, lines of authority, and communication for the key positions pertinent to environmental QA/QC are provided below. This organization facilitates the efficient production of project work, allows for an independent quality review, and permits resolution of any QA issues before submittal.

1.1 ENVIRONMENTAL PRINCIPAL-IN-CHARGE AND PROJECT MANAGER

The Principal-in-Charge has overall responsibility for executing the project in accordance with contractual requirements. John Herzog is the Principal-in-Charge. The Project Manager is responsible for selecting project team members, assigning and coordinating project tasks, determining subcontractor participation, establishing and adhering to budgets and schedules, providing technical oversight, and coordinating production and review of project deliverables. John Herzog (206-239-3252) is the Project Manager.

1.2 ENVIRONMENTAL FIELD COORDINATOR

The Field Coordinator is responsible for the daily management of activities in the field. Specific responsibilities include the following:

- Provides technical direction to the field staff.
- Develops schedules and allocates resources for field tasks.
- Coordinates data collection activities to be consistent with information requirements.
- Supervises the compilation of field data and laboratory analytical results.
- Assures that data are correctly and completely reported.
- Implements and oversees field sampling in accordance with project plans.

- Supervises field personnel.
- Coordinates work with on-site subcontractors.
- Schedules sample shipment with the analytical laboratory.
- Monitors that appropriate sampling, testing, and measurement procedures are followed.
- Coordinates the transfer of field data, sample tracking forms, and log books to the Project Manager for data reduction and validation.
- Participates in QA corrective actions as required.

Robert Trahan (or another designee) will be the Field Coordinator.

1.3 ENVIRONMENTAL QUALITY ASSURANCE LEADER

The QA Leader is responsible for coordinating QA/QC activities as they relate to the acquisition of field data. Specific responsibilities include the following:

- Serves as the official contact for laboratory data QA concerns.
- Reviews and approves the laboratory QA Plan.
- Responds to laboratory data QA needs, answers laboratory requests for guidance and assistance, and resolves issues.
- Monitors laboratory compliance with data quality requirements.
- Ensures that appropriate sampling, testing, and analysis procedures are followed and that proper QC checks are implemented.
- Reviews the implementation of the QAPP and the overall quality of the analytical data generated.
- Maintains the authority to implement corrective actions as necessary.

Mark Lybeer (206-239-3227) is the QA Leader.

1.4 LABORATORY MANAGEMENT

Subcontracted laboratories conducting sample analyses for this project are required to obtain approval from the QA Leader before initiating sample analysis, to assure that the laboratory QA Plan complies with the project QA objectives. The Laboratory's QA Coordinator administers the laboratory QA Plan and is responsible for laboratory QC. Specific responsibilities of this position include:

- Ensure implementation of the laboratory QA Plan.
- Serve as the laboratory point of contact.
- Activate corrective action as necessary for QC measures that exceed control limits.
- Provide final review of laboratory QA/QC data included in analytical data packages.
- Administer QA/QC sample analysis.
- Comply with the specifications established in the project plans as related to laboratory services.
- Participate in QA audits and compliance inspections.

OnSite Environmental will provide laboratory analytical services for the project. David Baumeister (425-883-3881) is the Laboratory's QA Coordinator for the project.

1.5 HEALTH AND SAFETY

A site-specific health and safety plan (HASP) will govern GeoEngineers' field activities; the HASP is presented in Appendix B of the EDR. The Field Coordinator will be responsible for implementing the HASP during sampling activities. The Project Manager will discuss health and safety issues with the Field Coordinator on a routine basis during field activities.

The Field Coordinator will stop any GeoEngineers work activities that do not comply with the HASP. Companies providing services for this project on a contracted or subcontracted basis will be responsible for developing and implementing their own HASP.

2.0 DATA QUALITY OBJECTIVES

The overall data quality objective for the project is to collect environmental sampling data of known, acceptable, and documentable quality. The specific objectives established for the project are:

- Implement the procedures outlined herein for field sampling, sample custody, equipment operation and calibration, laboratory analysis, and data reporting to ensure consistency and thoroughness of data generated.
- Achieve the level of QA/QC required to produce scientifically valid analytical data of known and documented quality. This will be accomplished by establishing criteria for data precision, accuracy, representativeness, completeness, and comparability, and by evaluating project data against these criteria.

The sampling design, field procedures, laboratory procedures, and QC procedures are established to provide high-quality data for use in this project. Specific data quality factors that may affect data usability include quantitative factors such as precision, bias, accuracy, completeness, analytical reporting limits, and water quality target test parameters (for sediment toxicity testing), and qualitative factors such as representativeness and comparability. The measurement quality objectives (MQOs) associated with these data quality factors are summarized in Table C-1 and are discussed below.

2.1 ANALYTES AND MATRICES OF CONCERN

Samples of soil and sediment will be collected during field activities as shown in Table 4 of the EDR. Groundwater samples may also be collected. Tables C-2 through C-4 summarize the planned analyses for soil, sediment, and groundwater, respectively.

2.2 ANALYTICAL DETECTION LIMITS

Analytical methods have quantitative limitations at a given statistical level of confidence that are typically expressed as the method detection limit (MDL). Individual instruments often can detect but not accurately quantify compounds at concentrations lower than the MDL, down to a lower limit referred to as the instrument detection limit (IDL). Although results reported near the MDL or IDL provide insight to site conditions, QA dictates that analytical methods achieve a consistently reliable level of detection known as the practical quantitation limit (PQL) or method reporting limit (MRL). The contract laboratory will provide numerical results for all analytes and report them either as detected or not detected above the PQL/MRL.

Achieving a stated detection limit for a given analyte is helpful in providing statistically useful data. Intended data uses, such as comparison to numerical criteria or risk assessment, typically dictate specific project target reporting limits (TRLs) necessary to fulfill stated objectives. Tables 1 through 3 in the EDR present Site-specific cleanup levels that dictate maximum acceptable TRLs for this project. The TRLs for Site contaminants of potential concern are presented in Tables C-1 through C-3 for soil, sediment, and groundwater, respectively. These TRLs will serve as the target laboratory MRLs for this project. It may be possible to achieve MRLs less than the TRLs under ideal conditions. However, the TRLs presented in Tables C-1 through C-3 are considered targets because several factors may influence final MRLs. First, moisture and other physical conditions of soil and sediment samples can affect MRLs. Second, analytical procedures may require sample dilutions or other practices to accurately quantify a particular analyte at concentrations above the range of the instrument. The effect of this is that other analytes could be reported as not detected, but at an MRL significantly higher than a specified TRL. Data users must be aware that elevated MRLs can bias statistical data summaries, and careful interpretation is required when using data sets with MRLs exceeding TRLs.

2.3 PRECISION

Precision is the measure of mutual agreement among replicate or duplicate measurements of an analyte from the same sample, and applies to field duplicate or split samples, replicate analyses, and duplicate spiked environmental samples (e.g., matrix spike duplicates, laboratory control sample duplicates). The closer the measured values are to each other, the more precise the measurement process. Precision error may affect data usability. Good precision is indicative of relative consistency and comparability between different samples. Precision will be expressed as the relative percent difference (RPD) for replicate/duplicate analyses, calculated as:

$$RPD\,(\%) = \frac{|D_1 - D_2|}{(D_1 + D_2)/2}\ X\ 100,$$

Where

D_1 = Concentration of analyte in sample.

D_2 = Concentration of analyte in replicate/duplicate sample.

The RPD will be calculated for samples and compared to the project RPD goals. Project RPD goals for all analyses are 35 percent for water samples and 50 percent for soil and sediment samples, unless the primary and duplicate sample results are less than 5 times the MRL, in which case RPD goals will not apply for data quality assessment purposes.

2.4 ACCURACY

Accuracy is a measure of bias in the analytical process. The closer the measurement value is to the true value, the greater the accuracy. Accuracy is typically evaluated by adding a known spike concentration of a target or surrogate compound to a sample prior to analysis. The detected concentration or percent recovery of the spiked compound reported in the sample provides a quantitative measure of analytical accuracy. Since most environmental data collected represent single points spatially and temporally rather than an average of values, accuracy is generally more important than precision in assessing the data. In general, if percent recoveries are low, non-detect results may be reported for compounds of interest when in fact these compounds are present (i.e., false negative results), and results for detected compounds may be biased low. The reverse is true when percent recoveries are high. In this case, non-detect values are considered accurate, whereas detected values may be higher than true values.

For this project, accuracy will be expressed as the percent recovery of a known surrogate spike, matrix spike, or laboratory control sample (blank spike), concentration:

$$Recovery\,(\%) = \frac{Spiked\ Result - Unspiked\ Result}{Known\ Spike\ Concentration}\ X\ 100$$

Accuracy criteria for surrogate spikes, matrix spikes, and laboratory control samples (blank spikes) are presented in Table C-1.

2.5 Representativeness, Completeness and Comparability

Representativeness expresses the degree to which data accurately and precisely represent the actual site conditions. Representativeness of the data will be evaluated by:

- Comparing actual sampling procedures to those specified in the EDR and this QAPP.
- Reviewing analytical results for field duplicates to determine the variability in the analytical results.
- Invalidating non-representative data or identifying data to be classified as questionable or qualitative. Only representative data will be used in subsequent data reduction, validation, and reporting activities.

Completeness establishes whether a sufficient amount of valid measurements were obtained to meet project objectives. The number of samples and results expected establishes the comparative basis for completeness. The completeness goal is 90 percent useable data for the samples/analyses planned. If the completeness goal is not achieved, an evaluation will be performed to determine if the data are adequate to meet study objectives.

Comparability expresses the confidence with which one set of data can be compared to another. Although numeric goals do not exist for comparability, a statement on comparability will be prepared to assess overall usefulness of data sets generated during the project, following the evaluation of precision and accuracy.

2.6 Holding Times

Holding times are defined as the time between sample collection and extraction, sample collection and analysis, or sample extraction and analysis. Some analytical methods specify a holding time for analysis only. For many methods, holding times may be extended by sample preservation techniques in the field. If a sample exceeds a holding time, then the results may be biased low. For example, if the extraction holding time for volatile analysis of soil sample is exceeded, then the possibility exists that some of the organic constituents may have volatilized from the sample or degraded. Results for that analysis would be qualified as estimated to indicate that the reported results may be lower than actual site conditions. Holding times are presented in Table C-5.

2.7 Blanks

According to the *National Functional Guidelines for Organic Data Review* (USEPA, 1999), "The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. The criteria for evaluation of blanks apply to any blank associated with the samples (e.g., method blanks, instrument blanks, trip blanks, and equipment blanks)." Trip blanks are placed with samples during shipment; method blanks are created during sample preparation and follow samples throughout the analysis process.

Analytical results for blanks will be interpreted in general accordance with *National Functional Guidelines for Organic Data Review* and professional judgment.

3.0 SAMPLE COLLECTION, HANDLING AND CUSTODY

3.1 SAMPLING EQUIPMENT AND DECONTAMINATION PROCEDURES

Soil samples will be collected using excavation equipment (i.e., backhoe or excavator), hand tools such as spades, hand trowels, stainless steel spoons, and stainless steel mixing bowls (for composite samples), and/or drilling equipment (e.g., split-spoon drive sampler). Sediment samples will be collected using a grab type sampler or will be collected directly from the dredge bucket. Groundwater samples will be collected from monitoring wells using submersible or peristaltic pumps and low-flow sampling protocol.

Excavation equipment used for soil sampling will not be decontaminated; however, samples will be collected from the center of the backhoe or excavator bucket or from an area of soil that the surface of the bucket has not touched. Sediment sampling equipment, if used, will be decontaminated prior to the collection of each sediment sample. Sediment sampling equipment decontamination procedures will consist of washing with a non-phosphate detergent solution and rinsing with marine water from each sample location. The sediment samples will be collected from an area of sediment that is not in contact with the surface of the sampler. Drilling equipment used for monitoring well installations will be decontaminated before beginning each exploration using a hot-water pressure washer.

Reusable sampling equipment that comes in contact with soil, sediment, or groundwater will be decontaminated before each use. Decontamination procedures for this equipment will consist of the following: (1) wash with brush and non-phosphate detergent solution (e.g., Liqui-Nox and distilled water), (2) rinse with distilled water, and (3) place the decontaminated equipment on clean plastic sheeting or in a clean plastic bag. Field personnel will limit cross-contamination by changing gloves between sampling events. Wash water used to decontaminate the reusable sampling equipment will be discharged to the sanitary sewer on Port property.

In addition to the decontamination procedures described above, sampling equipment that has visible contaminant residue will be decontaminated by hot-water pressure washing and/or as follows:

- Wash with brush and non-phosphate detergent solution.
- Rinse with potable water.
- Rinse with distilled water.

3.2 FIELD SCREENING PROCEDURES

The potential presence of contamination in soil samples will be evaluated using field screening techniques. Field screening results will be recorded on the field logs and the results will be used as a general guideline to delineate areas of possible contamination. In addition, screening results will potentially be used as a basis for selecting soil samples for chemical analysis. The following screening methods will be used: (1) visual screening; (2) water sheen screening; (3) headspace vapor screening; and (possibly) (4) metals screening.

3.2.1 Visual Screening

The soil will be observed for unusual color and/or staining indicative of possible contamination.

3.2.2 Water Sheen Screening

Water sheen screening involves placing a portion of the soil sample in a pan containing distilled water, and observing the water surface for signs of sheen. This is a relatively sensitive, qualitative field screening method that can help identify the presence or absence of petroleum hydrocarbons and other contaminants, sometimes at concentrations lower than regulatory cleanup guidelines. The following sheen classifications will be used:

Classification	Identifier	Description
No Sheen	(NS)	No visible sheen on the water surface.
Slight Sheen	(SS)	Light, colorless, dull sheen; spotty to globular; spread is irregular, not rapid; sheen dissipates rapidly; areas of no sheen remain.
Moderate Sheen	(MS)	Light to heavy sheen; may have some color/iridescence; globular to stringy; spread is irregular to flowing, may be rapid; few remaining areas of no sheen on the water surface.
Heavy Sheen	(HS)	Heavy sheen with color/iridescence; stringy; spread is rapid; entire water surface may be covered with sheen; sheen flows off the sample.

Headspace Vapor Screening

This is a semi-quantitative field screening method that can help identify the presence or absence of volatile organic compounds (VOCs) in soil samples. A portion of the soil sample will be placed in a resealable plastic bag. Ambient air will be captured in the bag; the bag will be sealed and then shaken gently to expose the soil to the air trapped in the bag. The bag will remain closed for approximately 5 minutes at ambient temperature before the headspace vapors are measured. Vapors present within the sample bag's headspace will be measured by inserting the probe of a photoionization detector (PID) through a small opening in the bag, taking care not to clog the probe with soil. The maximum PID reading (in part per million [ppm]) and the ambient air temperature will be recorded on the field log for each sample. The PID will be calibrated to 100 ppm isobutylene each day prior to soil sampling. No soil sample used for headspace screening will be submitted to the laboratory for chemical analysis.

Metals Screening

(Methodology TBD – metal-specific test strips, XRF, etc.)

3.3 SAMPLE CONTAINERS AND LABELING

The Field Coordinator will establish field protocol to manage field sample collection, handling, and documentation. Soil, sediment, and groundwater samples will be placed in appropriate laboratory-prepared containers. Sample containers and preservatives are listed in Table C-5.

Each sediment sample will be placed in a decontaminated stainless steel bowl and homogenized by mixing with a decontaminated stainless steel spoon prior to transferring the sample to the appropriate container.

Sample containers will be labeled with the following information at the time of sample collection:

- Project name and number

- Type of sample preservative used (where applicable)
- Sample name, which will include a reference to date and sampling depth (if applicable)
- Date and time of collection

The sample collection activities will be noted in the field log books. The Field Coordinator will monitor consistency between the EDR, sample containers/labels, field log books, and chain-of-custody (COC) forms.

3.4 SAMPLE STORAGE

Samples will be placed in a cooler with ice after they are collected. The objective of the cold storage will be to attain a sample temperature of 2 to 6 degrees Celsius. Holding times (Table C-5) will be observed during sample storage.

3.5 SAMPLE SHIPMENT

Samples will be transported and delivered to the analytical laboratory in the sample coolers. The samples will either be transported by field personnel or by courier service. The Field Coordinator will monitor that the cooler has been properly secured using clear plastic tape and/or custody seals.

3.6 CHAIN-OF-CUSTODY RECORDS

Field personnel are responsible for the security of samples from the time the samples are collected until the samples have been received by the shipper or laboratory. A COC form will be completed for each group of samples being shipped to the laboratory. Information to be included on the COC form includes:

- Project name and number;
- Sample identification numbers;
- Date and time of sampling;
- Sample matrix (soil, sediment, water, etc.), preservative, and number of containers for each sample;
- Analyses to be performed;
- Names of sampling personnel;
- Project manager name and contact information including phone number; and
- Shipping information including shipping container number, if applicable.

The original COC form will be signed by a member of the field team and bear a unique tracking number. Field personnel will retain carbon copies and place the original and remaining copies in a plastic bag. The plastic bag containing the COC form will be placed in the cooler before sealing the cooler for transport to the laboratory.

3.7 LABORATORY CUSTODY PROCEDURES

The laboratory will follow their standard operating procedures (SOPs) to document sample handling from time of receipt (sample log-in) to reporting. Documentation will include, at a minimum, the analyst's name or initials, time, and date.

3.8 FIELD DOCUMENTATION

Field documentation provides important information about potential problems or special circumstances surrounding sample collection. Field personnel will maintain daily field logs. The field logs will be prepared on field report forms or in a bound logbook. Entries in the field logs and associated sample documentation forms will be made in waterproof ink, and corrections will consist of line-out deletions that are initialed and dated. Individual logbooks will become part of the project files at the conclusion of the field work.

At a minimum, the following information will be recorded during the collection of each sample.

- Sample location and description
- Site or sampling area sketch showing sample location and measured distances
- Sampler's name(s)
- Date and time of sample collection
- Designation of sample as composite or discrete
- Sample matrix (soil, sediment, or water)
- Type of sampling equipment used
- Field instrument (e.g., PID) readings
- Field observations and details that are pertinent to the integrity/condition of the samples (e.g., weather conditions, performance of the sampling equipment, sample depth control, sample disturbance, etc.)
- Preliminary sample descriptions (e.g., lithologies, field screening results)
- Gross characteristics of sediment samples (e.g. texture, color, biological structures, presence of debris, etc.)
- Sample preservation
- Sample transport/shipping arrangements
- Name of recipient laboratory

In addition to the sampling information, the following specific information also will be recorded in the field log for each day of sampling.

- Sampling team members
- Time of arrival/entry on Site and time of Site departure
- Other personnel present at the Site
- Summary of pertinent meetings or discussions with regulatory agency or contractor personnel
- Deviations from sampling plans, QAPP procedures, and HASP
- Changes in field personnel and responsibilities with reasons for the changes
- Levels of safety protection
- Calibration readings for any field instruments used

The handling, use, and maintenance of field log books are the Field Coordinator's responsibility.

4.0 CALIBRATION PROCEDURES

4.1 Field Instrumentation

Field instrument calibration and calibration checks facilitate accurate and reliable field measurements. The calibration of field instruments used on the project will be checked and adjusted as necessary in general accordance with the manufacturer's recommendations. Methods and intervals of calibration checks and instrument maintenance will be based on the type of instrument, stability characteristics, required accuracy, intended use, and environmental conditions. The basic calibration check frequencies are described below.

The calibration of the PID used for headspace vapor screening will be checked at the start of each day it is used. If necessary (based on the calibration check results), the instrument will be calibrated in general accordance with the manufacturer's specifications. Calibration check and calibration results will be recorded in the field logbook.

The calibration of the water quality meter (e.g., Horiba U-22) will be checked, and if necessary, the instrument will be calibrated, prior to each water sampling event. The instrument will be calibrated in general accordance with the manufacturer's specifications. Calibration check and calibration results will be recorded in the field logbook.

4.2 Laboratory Instrumentation

For chemical analytical testing, calibration procedures will be performed in general accordance with the analytical methods used and the laboratory's SOPs. Calibration documentation will be retained at the laboratory.

5.0 LABORATORY DATA REPORTING AND DELIVERABLES

Laboratories will report data in formatted hardcopy and digital formats. Analytical laboratory measurements will be recorded in standard formats that display, at a minimum, the field sample identification, the laboratory identification, reporting units, data qualifiers, analytical method, analyte tested, analytical result, extraction and analysis dates, and quantitation limits. Each sample delivery group will be accompanied by sample receipt forms and a case narrative identifying data quality issues. Laboratory electronic data deliverable (EDD) requirements will be established by GeoEngineers, Inc. with the contract laboratory. The laboratory will send final analytical testing results to the Project Manager.

Chromatograms will be provided for samples analyzed using Ecology Method NWTPH-Dx. The laboratory will assure that the full height of all peaks appear on the chromatograms and that the same horizontal time scale is used to allow for comparisons to other chromatograms.

6.0 INTERNAL QUALITY CONTROL

Table C-6 summarizes the types and frequency of QC samples to be analyzed, including both field QC and laboratory QC samples.

6.1 Field Quality Control

Field QC samples serve as a control and check mechanism to monitor the consistency of sampling methods and the potential influence of off-site factors on project samples. Examples of off-site factors include airborne VOCs and contaminants that may be present in potable water used during drilling activities.

6.1.1 Field Duplicates

In addition to replicate analyses performed in the laboratory, field duplicates also serve as measures for precision. Under ideal field conditions, field duplicates (sometimes referred to as splits), are created by thoroughly mixing a volume of the sample matrix, placing aliquots of the mixed sample in separate containers, and identifying one of the aliquots as the primary sample and the other as the duplicate sample. Field duplicates measure the precision and consistency of laboratory analytical procedures and methods, as well as the consistency of the sampling techniques used by field personnel.

One field duplicate will be collected for every ten soil verification samples and every ten sediment verification samples. Field duplicates will not be collected for sediment toxicity testing or from soil stockpiles. For groundwater, one field duplicate will be collected for every ten samples collected per sampling event.

6.1.2 Equipment Rinsate Blanks

Equipment rinsate blanks will be used to evaluate the effectiveness of decontamination procedures for preventing possible cross-contamination of project samples. Rinsate samples will be collected by slowly pouring distilled water over decontaminated sampling equipment and collecting the rinse water in appropriate sample containers for analysis.

A minimum of one equipment rinsate blank will be collected for every day of soil and/or sediment verification sampling and every day of groundwater sampling. Equipment rinsate blanks will not be collected for sediment toxicity testing or for soil stockpile characterization sampling.

6.1.3 Trip Blanks

Trip blanks consist of samples of reagent water that accompany samples to be analyzed for VOCs during sample storage in coolers and transport to the laboratory. They are used to assess potential contamination of samples during collection and transport due to the presence of VOCs in ambient air. Because VOCs are not a contaminant of concern at the Site, trip blanks will not be analyzed during this project.

6.2 Laboratory Quality Control

Laboratory QC procedures will be evaluated through a formal data quality assessment process. The analytical laboratory will follow standard analytical method procedures that include specified QC monitoring requirements. These requirements will vary by method, but generally include:

- Method blanks
- Internal standards
- Instrument calibrations
- Matrix spike/matrix spike duplicates (MS/MSD)
- Laboratory control samples/laboratory control sample duplicates (LCS/LCSD)

- Laboratory replicates or duplicates
- Surrogate spikes

The following QC requirements are specific to sediment toxicity testing (bioassays).

- Negative and positive controls
- Reference sample testing
- Water quality target test parameters

6.2.1 Laboratory Blanks

Laboratory procedures utilize several types of blanks, but the most commonly used blanks for QC monitoring are method blanks. Method blanks are laboratory QC samples that consist of either a soil-like material having undergone a contaminant destruction process, or reagent (contaminant-free) water. Method blanks are extracted and analyzed with each batch of environmental samples undergoing analysis. Method blanks are particularly useful during volatiles analysis since VOCs can be transported in the laboratory through the vapor phase. If a substance is detected in a method blank, then one (or more) of the following occurred:

- Sample containers, measurement equipment, and/or analytical instruments were not properly cleaned and contained contaminants.
- Reagents used in the process were contaminated with a substance(s) of interest.
- Volatile substances in ambient laboratory air with high solubility or affinities toward the sample matrix contaminated the samples during preparation or analysis.

It is difficult to determine which of the above scenarios took place if blank contamination occurs. However, it is assumed that the conditions that affected the blanks also likely affected the project samples. If target analytes are detected in method blanks, data validation guidelines assist in determining which substances in project samples are considered "real," and which ones are attributable to the analytical process. Furthermore, the guidelines state, ". . . there may be instances where little or no contamination was present in the associated blank, but qualification of the sample is deemed necessary. Contamination introduced through dilution water is one example."

Calibrations

Several types of instrument calibrations are used, depending on the analytical method, to assess the linearity of the calibration curve and assure that the sample results reflect accurate and precise measurements. The main calibrations used are initial calibrations, daily calibrations, and continuing calibration verification.

Matrix Spike/Matrix Spike Duplicates (MS/MSD)

MS/MSD samples are used to assess influences or interferences caused by the physical or chemical properties of the sample itself. For example, extreme pH can affect the results for semivolatile organic compounds. Or, the presence of a particular compound may interfere with accurate quantitation of another analyte. MS/MSD data is reviewed in combination with other QC monitoring data to determine matrix effects. In some cases, matrix effects cannot be determined due to dilution and/or high levels of related substances in the sample. A matrix spike is evaluated by spiking a project sample with a known amount of one or more of the target analytes, ideally at a concentration that is 5 to 10 times higher than the sample result. A percent recovery is then calculated by subtracting the un-spiked sample result from the spiked sample result, dividing by the known concentration of the spike, and multiplying by 100.

MS/MSD samples will be analyzed at a frequency of one MS/MSD per 20 project samples. The samples for the MS/MSD analyses should be collected from a boring or sampling location that is believed to have only low-level contamination. A sample from an area of low-level contamination is needed because the objective of MS/MSD analyses is to determine the presence of matrix interferences, which can best be achieved with low levels of contaminants. Additional sample volume will be collected for the MS/MSD analyses as required by the laboratory.

Laboratory Control Sample/ Laboratory Control Sample Duplicates (LCS/LCSD)
Also known as blanks spikes, laboratory control samples (LCS) are similar to MS samples in that a known amount of one or more of the target analytes are spiked into a prepared sample medium, and a percent recovery of the spiked substances is calculated. The primary difference between LCS and MS samples is that the LCS uses a contaminant-free sample medium. For example, reagent water is typically used for LCS water analyses. The purpose of an LCS is to help assess the overall accuracy and precision of the analytical process including sample preparation, instrument performance, and analyst performance.

Laboratory Replicates/Duplicates
Laboratories utilize MS/MSDs, LCS/LCSDs, and/or replicates to assess precision. Replicates are a second analysis of a field-collected environmental sample. Replicates can be split at varying stages of the sample preparation and analysis process; they most commonly consist of a second analysis on the extracted media.

Surrogate Spikes
Surrogate spikes are used to verify proper extraction procedures and the accuracy of the analytical instrument. Surrogates are substances with characteristics similar to the target analytes. A known concentration of surrogate is added to the project sample and passed through the instrument, and percent recovery is calculated. Each surrogate used has acceptance limits (i.e., an acceptable range) for percent recovery. If a surrogate recovery is low, sample results may be biased low and depending on the recovery value, a possibility of false negatives may exist. Conversely, when recoveries are above the specified acceptance limits, a possibility of false positives exist, although non-detect results are considered accurate.

Negative/Positive Controls for Bioassays
Negative controls are used for bioassay testing to control for the effects of natural growth and mortality in a batch of organisms. Negative controls consist of clean, nontoxic seawater and sediment samples collected outside of the study area. At least one chamber in each test series for every organism must be a negative control containing clean material.

Positive controls containing reference toxicants are used for bioassay testing to provide information regarding organism mortality or increased sensitivity that may occur as a result of disease, changes in tolerance/sensitivity, or loading density. Positive controls can also provide information regarding non-lethal effects that occur due to acclimation, insensitivity, or stress tolerance developed during handling and acclimation. Positive controls using a reference toxicant should be implemented for each bioassay test series (EPA and PSWQA, July 1995).

Reference Samples for Bioassays
Reference sediment samples are collected for bioassay testing to provide data that can be used to separate toxicant effects from unrelated effects such as effects related to sediment grain size. The reference

sample should be collected from an area that is known to be free from chemical contamination and should represent the range of important natural physical and chemical characteristics of the test sediments. Wet sieving should be used to match the grain size of the reference sediment sample to the project sediment samples (EPA and PSWQA, July 1995).

Water Quality Target Test Parameters for Bioassays

Sediment toxicity tests have water quality target test parameters specific to each organism as indicated in the "Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments" (EPA and PSWQA, July 1995). The purpose of measuring water quality conditions in each bioassay test chamber before, during, and after testing is to ensure that the proper conditions are maintained to ensure the survival of the organisms and to ensure that undue stress is not exerted on the organisms related to the test sediments. Salinity, dissolved oxygen, pH, and temperature should be measured at the start of each bioassay test, periodically during each test, and at the end of each test. Sulfides, ammonia, and other conventional water quality variables that may influence bioassay testing results should also be measured at the beginning and end of each test.

7.0 DATA REDUCTION AND ASSESSMENT PROCEDURES

7.1 DATA REDUCTION

Data reduction involves the conversion or transcription of field and analytical data to a useable format. The laboratory personnel will reduce the analytical data for review by the QA Leader and Project Manager.

7.2 REVIEW OF FIELD DOCUMENTATION AND LABORATORY RECEIPT INFORMATION

Documentation of field sampling data will be reviewed periodically for conformance with project QC requirements described in this QAPP. At a minimum, field documentation will be checked for proper documentation of the following:

- Sample collection information (date, time, location, matrices, etc.);
- Field instruments used and calibration data;
- Sample collection protocol;
- Sample containers, preservation, and volume;
- Field QC samples collected at the frequency specified;
- COC protocols; and
- Sample shipment information.

Sample receipt forms provided by the laboratory will be reviewed for QC exceptions. The final laboratory data package will describe (in the case narrative) the effects that any identified QC exceptions have on data quality. The laboratory will review transcribed sample collection and receipt information for correctness prior to delivering the final data package.

7.3 DATA QUALITY ASSESSMENT

Data quality assessment of Level II laboratory data packages will consist of a formal review of the following QC parameters.

- Holding times and sample preservation
- Method blanks
- MS/MSD analyses
- LCS/LCSD analyses
- Surrogate spikes
- Duplicates/replicates
- Negative/positive controls (for sediment bioassay testing)
- Reference sediment samples (for sediment bioassay testing)
- Water quality target test parameters (for sediment bioassay testing)

In addition to these QC parameters, other documentation such as sample receipt forms and case narratives will be reviewed to evaluate laboratory QA/QC.

Level IV laboratory data packages will be obtained for 10 percent of the soil and sediment verification samples obtained from remedial excavations and dredged areas. These data will be validated in general conformance with EPA functional guidelines for data validation.

EQuIS four-file format electronic data deliverables will be obtained from the laboratory and data will be submitted into Ecology's Environmental Information Management (EIM) system after data quality assessments are completed.

REFERENCES

U.S. Environmental Protection Agency and Puget Sound Water Quality Action Team, 1995. "Recommended Guidelines for Conducting Laboratory Bioassays on Puget Sound Sediments." July, 1995. EPA and PSWQA.

U.S. Environmental Protection Agency and Puget Sound Water Quality Action Team, 1997. "Recommended Guidelines for Sampling Marine Sediment, Water Column and Tissue in Puget Sound." April, 1997. EPA and PSWQA.

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Washington Administrative Code (WAC) 173, Chapter 173-340-820.

Washington Administrative Code (WAC) 173, Chapter 173-204.

Washington State Department of Ecology, 2008. "Sediment Sampling and Analysis Appendix," February, 2008. Ecology.

TABLE C-1
MEASUREMENT QUALITY OBJECTIVES
FORMER SCOTT PAPER COMPANY MILL SITE
ANACORTES, WASHINGTON

		Check Standard (LCS) %R Limits[2,3]		MS - %R Limits[3]		SS %R Limits [1,2,3]	MS Duplicate Samples or Lab Duplicate RPD Limits[4]		Field Duplicate Samples RPD Limits[4]	
Laboratory Analysis	Reference Method	Soil/Sediment	Water	Soil/Sediment	Water	Soil/Sediment/Water	Soil/Sediment	Water	Soil/Sediment	Water
Diesel- and Motor oil-range Hydrocarbons	Ecology NWTPH-Dx with acid/silica gel cleanup	50%-150%	50%-150%	NA	NA	50%-150%	≤40%	≤40%	≤50%	≤35%
cPAHs	EPA 8270-SIM	70%-130%	70%-130%	70%-130%	70%-130%	70%-130%	≤30%	≤30%	≤50%	≤35%
PCB aroclors	GC/ECD EPA 8082	70%-130%	70%-130%	70%-130%	70%-130%	70%-130%	≤40%	≤40%	≤50%	≤35%
Total Metals (As, Cd, Cr (tot. & hexavalent), Cu, Hg, Ni, Pb, Sb, Tl, Zn)	EPA 6010/7060/7470/7471/7421	80%-120%	80%-120%	75%-125%	75%-125%	NA	≤20%	≤20%	≤50%	≤35%
TCLP Metals (As, Cd, Cr, Hg, Pb)	TCLP, EPA 1311	80%-120%	80%-120%	75%-125%	75%-125%	NA	≤20%	≤20%	≤50%	≤35%
Dioxins/Furans	SW-846 8290	70%-130%	70%-130%	NA	NA	50%-150%	≤20%	≤20%	≤50%	≤35%
Total Solids (% wet wt.)	2540 B-97/PSEP (1986)	NA	NA	NA	NA	NA	20% RSD	NA	≤50%	≤35%
Total Volatile Solids (% dry weight)	EPA 160.4	75%-125%	75%-125%	75%-125%	75%-125%	NA	±20%	±20%	≤50%	≤35%
Total Organic Carbon	EPA 9060	75%-125%	75%-125%	75%-125%	75%-125%	NA	±20%	75%-125%	≤50%	≤35%
Bioassay Testing (Sediment only)	PSEP 1995, Ecology SAPA 2008/SMARM	Control Limit Temp (°C)[5]		Control Limit Salinity (ppt)[5]			Control Limit Dissolved Oxygen (% saturation)[5]		Performance Standards[5]	
	10-day acute amphipod test	15±1		=interstitial			NA		Control Mean Mortality <10 %; Reference Mean mortality <25 %	
	20-day juvenile polychaete growth test	20±1		28±2			NA		Control Mean Mortality <10 %; Mean individual growth rate ≥ 0.72 mg/ind/day. Test failure = growth rate <0.38 mg/ind/day. Reference Mean individual growth rate ≥80% of control mean individual growth rate	
	48-96 hour acute larval development test	16±1		28±1			>60		Control Mean Mortality <10 %; Reference Mean Mortality <25 %	

Notes:

Method numbers refer to EPA SW-846 Analytical Methods, Washington State Department of Ecology (Ecology), or Puget Sound Estuary Program (PSEP) recommended analytical metho

[1] Individual surrogate recoveries are compound-specific

[2] Recovery ranges are estimates. Actual ranges will be provided by the laboratory when contracted.

[3] Percent recovery limits are expressed as ranges based on laboratory control limits. Limits will vary for individual analytes.

[4] RPD control limits are only applicable if the primary and duplicate sample concentrations are greater than 5 times the method reporting limit (MRL). For results less than 5 times the MRL, the difference between the primary and duplicate samples must be less than 2X the MRL for soils/sediments and 1X the MRL for waters.

[5] Control limits and performance standards as stated in Ecology's SAPA (2008).

cPAHs = Carcinogenic polycyclic aromatic hydrocarbons
LCS = Laboratory control sample
mg/ind/day = Milligrams per individual per day
MS = Matrix spike
NA = Not applicable
PCBs = Polychlorinated biphenyls
ppt = Parts per trillion
RSD = Relative standard deviation
RPD = Relative percent difference
SS = Surrogate standards
SAPA = Sediment Sampling and Analysis Plan Addendum (Ecology, 2008).
TCLP = Toxicity characteristic leaching procedure
SMARM = Sediment Management Annual Review Meeting

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Table C-2
Methods of Analysis and Target Reporting Limits (Soil)
Former Scott Paper Company Mill Site
Anacortes, Washington

Analyte	Analytical Method	Method Reporting Limit
Metals (mg/kg)		
Antimony	EPA 6010	5.0
Arsenic	EPA 6010/7060 A	10
Chromium (total)	EPA 6010	0.5
Chromium VI	EPA 6010	1.0
Copper	EPA 6010	0.5
Lead	EPA 6010/7421	5.0
Mercury	EPA 7470/7471	0.25
Nickel	EPA 6010	2.5
Thallium	EPA 6010	5.0
Zinc	EPA 6010	2.5
TCLP Metals	EPA 1311	
Arsenic	EPA 1311	0.4
Cadmium	EPA 1311	0.02
Chromium	EPA 1311	0.02
Mercury	EPA 1311	0.005
Lead	EPA 1311	0.20
Petroleum Hydrocarbons (mg/kg)		
Diesel-range	Ecology NWTPH-Dx with acid/silica gel cleanup	25
Heavy oil-range	Ecology NWTPH-Dx with acid/silica gel cleanup	50
cPAHs (ug/kg)		
Benzo[a]anthracene	EPA 8270 SIM	6.7
Chrysene	EPA 8270 SIM	6.7
Benzo[b]fluoranthene	EPA 8270 SIM	6.7
Benzo[k]fluoranthene	EPA 8270 SIM	6.7
Benzo[a]pyrene	EPA 8270 SIM	6.7
indeno[1,2,3 -cd]pyrene	EPA 8270 SIM	6.7
Dibenz[a,h]anthracene	EPA 8270 SIM	6.7
Polychlorinated Biphenyls (ug/kg)		
PCBs Aroclors	EPA 8082 GC/ECD	0.05
Dioxins/Furans (ng/kg)		
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	SW-846 8290	1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	SW-846 8290	5
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	SW-846 8290	5
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	SW-846 8290	5
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	SW-846 8290	5
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	SW-846 8290	5
Octachlorodibenzo-p-dioxin (OCDD)	SW-846 8290	10
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	SW-846 8290	1
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	SW-846 8290	5
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	SW-846 8290	5
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	SW-846 8290	5
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	SW-846 8290	5
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	SW-846 8290	5
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	SW-846 8290	5
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	SW-846 8290	5
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	SW-846 8290	5
Octachlorodibenzofuran (OCDF)	SW-846 8290	10

Notes:
EPA = U.S. Environmental Protection Agency
SIM = Selective ion monitoring
cPAHs = Carcinogenic polycyclic aromatic hydrocarbons
mg/kg = Milligrams per kilogram
ug/kg = Micrograms per kilogram
ng/kg = Nanograms per kilogram

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Table C-3
Methods of Analysis and Target Reporting Limits (Sediment)
Former Scott Paper Company Mill Site
Anacortes, Washington

Analyte	Analytical Method	Method Reporting Limit
Conventionals		
Total volatile solids (%)	EPA 160.4	1.0
Total solids (%)	EPA 160.3	1.0
Total organic carbon (ug/kg)	Plumb (1981)	400
Metals (mg/kg)		
Copper	EPA 6010	0.5
Lead	EPA 6010/7060A	5.0
Mercury	EPA 7470/7471	0.25
Polychlorinated Biphenyls (ug/kg)		
PCBs Aroclors	EPA 8082 GC/ECD	0.05
Petroleum Hydrocarbons (mg/kg)		
Diesel-range	Ecology NWTPH-Dx with acid/silica gel cleanup	25
Heavy oil-range	Ecology NWTPH-Dx with acid/silica gel cleanup	50

Notes:
EPA = U.S. Environmental Protection Agency
PSEP = Puget Sound Estuary Program
ug/kg = Micrograms per kilogram
mg/kg = Milligrams per kilogram

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Table C-4

Methods of Analysis and Target Reporting Limits (Groundwater)

Former Scott Paper Company Mill Site

Anacortes, Washington

Analyte	Analytical Method	Method Reporting Limit
Metals (µg/L)		
Antimony	EPA 200.8/6020	5.5
Arsenic	EPA 200.8/6020	3.3
Chromium (total)	EPA 200.8/6020	11
Copper	EPA 200.8/6020	11
Lead	EPA 200.8/6020	1.1
Mercury	EPA 7470/7471A	0.5
Nickel	EPA 200.8/6020	56
Thallium	EPA 200.8/6020	5.6
Zinc	EPA 200.8/6020	56
Petroleum Hydrocarbons (mg/L)		
Diesel-range	Ecology NWTPH-Dx with acid/silica gel cleanup	0.25
Heavy oil-range	Ecology NWTPH-Dx with acid/silica gel cleanup	0.40
cPAHs (ng/L)		
Benzo[a]anthracene	EPA 8270 SIM	10
Chrysene	EPA 8270 SIM	10
Benzo[b]fluoranthene	EPA 8270 SIM	10
Benzo[k]fluoranthene	EPA 8270 SIM	10
Benzo[a]pyrene	EPA 8270 SIM	10
indeno[1,2,3 -cd]pyrene	EPA 8270 SIM	10
Dibenz[a,h]anthracene	EPA 8270 SIM	10
Polychlorinated Biphenyls (µg/L)		
Total PCBs	EPA 8082 GC/ECD	0.05
Dioxins/Furans (pg/L)		
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	EPA 8290	10
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	EPA 8290	50
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 8290	50
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 8290	50
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	EPA 8290	50
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	EPA 8290	50
Octachlorodibenzo-p-dioxin (OCDD)	EPA 8290	50
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	EPA 8290	100
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	EPA 8290	50
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	EPA 8290	50
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 8290	50
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	EPA 8290	50
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 8290	50
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	EPA 8290	50
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	EPA 8290	50
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	EPA 8290	50
Octachlorodibenzofuran (OCDF)	EPA 8290	100

Notes:

EPA = U.S. Environmental Protection Agency

SIM = Selective ion monitoring

cPAHs = Carcinogenic polycyclic aromatic hydrocarbons

mg/L = Milligrams per liter

µg/L = Micrograms per liter

ng/L = Nanograms per liter

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TABLE C-5

TEST METHODS, SAMPLE CONTAINERS, PRESERVATION & HOLDING TIMES

FORMER SCOTT PAPER COMPANY MILL SITE

ANACORTES, WASHINGTON

Analysis	Method	Soil/Sediment				Groundwater			
		Minimum Sample Size	Sample Containers	Sample Preservation	Holding Times	Minimum Sample Size	Sample Containers	Sample Preservation	Holding Times
Diesel- and Oil-Range Hydrocarbons	Ecology NWTPH-Dx with acid/silica gel cleanup	100 g	8 or 16 oz amber glass wide-mouth with Teflon-lined lid	Cool 4°C	14 days to extraction, 40 days from extraction to analysis	1 L	1 liter amber glass with Teflon-lined lid	Cool 4 C, HCl to pH < 2	14 days to extraction 40 days from extraction to analysis
cPAHs	EPA 8270 SIM	100 g	4 or 8 oz glass widemouth with Teflon-lined lid	Cool 4°C	14 days to extraction, 40 days from extraction to analysis	1 L	1 liter amber glass with Teflon-lined lid	Cool 4°C	7 days to extraction 40 days from extraction to analysis
PCBs	EPA 8082 Low level	100 g	4 or 8 oz glass widemouth with Teflon-lined lid	Cool 4°C	14 days to extraction, 40 days from extraction to analysis	1 L	1 liter amber glass with Teflon-lined lid	Cool 4°C	7 days to extraction 40 days from extraction to analysis
Metals**	EPA 6010/7060/7470/7471 /7421	100 g	4 or 8 oz glass widemouth with Teflon-lined lid	Cool 4°C	180 days/ 28 days for Mercury	500 mL	1 L poly bottle	HNO_3 - pH<2 (Dissolved metals preserved after filtration)	180 days (28 days for Mercury)
Dioxins/furans	SW-846 8290	100 g	4 or 8 oz glass widemouth with Teflon-lined lid	Cool 4°C	30 days	2 L	2- 1L amber glass with Teflon-lined lid	Cool 4°C	30 days
Conventionals (total organic carbons, total volatile solids, total solids)	EPA 160.4 PSEP	25 g, 50 g, 50 g	4 oz glass widemouth with Teflon-line lid	Cool 4°C	14 days; 6 months if frozen (-18°C) For total sulfides7 days; zero headspace	--	--	--	--
Bioassay Testing	PSEP 1995, Ecology SAPA 2008/SMARM	0.25 L per replicate (5-7 L)	5 gallon, sealable plastic bags or plastic buckets	Cool 4°C	14 days	--	--	--	--

Notes:

Holding times are based on elapsed time from date of collection.

**Metals to be analyzed include antimony, arsenic, cadmium, total chromium, chromium VI, copper, lead, mercury, nickel, thallium and zinc.

cPAHs = Carcinogenic polycyclic aromatic hydrocarbons

PCBs = Polychlorinated biphenyls

HCl = Hydrochloric acid

HNO_3 = Nitric acid

PSEP = Puget Sound Estuary Program

SAPA = Sediment Sampling and Analysis Plan Addendum (Ecology, 2008)

SMARM = Sedment Management Annual Review Meeting

oz = Ounce

mL = Milliliter

L = Liter

g = Gram

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TABLE C-6
QUALITY CONTROL SAMPLES TYPE AND FREQUENCY
FORMER SCOTT PAPER COMPANY MILL SITE
ANACORTES, WASHINGTON

Parameter	Field QC		Laboratory QC			
	Field Duplicates	Trip Blanks	Method Blanks	LCS	MS / MSD	Lab Duplicates
Diesel and Oil Range Hydrocarbons with silica gel/acid wash cleanup	1/10 groundwater/soil/sediment samples	NA	1/batch	1/batch	NA	1/batch
cPAHs	1/10 groundwater/soil/sediment samples	NA	1/batch	1/batch	1 set/batch	NA
PCBs	1/10 groundwater/soil/sediment samples	NA	1/batch	1/batch	1 set/batch	NA
Metals	1/10 groundwater/soil/sediment samples	NA	1/batch	1/batch	1 MS/batch	1/batch
Dioxins/furans	1/10 groundwater/soil/sediment samples	NA	1/batch	1/batch	NA	NA
Conventionals (total volatile solids, total organic carbon, total solids)	1/10 sediment samples	NA	1/batch	1/batch	NA	NA

Note:

An analytical lot or batch is defined as a group of samples taken through a preparation procedure and sharing a method blank, LCS, and MS/ MSD (or MS and lab duplicate). No more than 20 field samples can be contained in one batch.

LCS = Laboratory control sample

MS = Matrix spike sample

MSD = Matrix spike duplicate sample

cPAHs = carcinogenic polycyclic aromatic hydrocarbons

PCBs = polychlorinated biphenyls

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APPENDIX D
CULTURAL RESOURCES ASSESSMENT

Cultural Resources Assessment of the Former Scott Paper Mill Site Anacortes, Skagit County, Washington

Submitted to

Port of Anacortes, Washington

Submitted by

Gail Thompson, Ph.D., Derek Shaw, M.A., and Shari Maria Silverman, M.A.
Seattle, Washington

January 2009

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1.0 Introduction

The Port of Anacortes (Port) is under an Agreed Order with the Washington State Department of Ecology to clean up contaminated soil, sediment, and wood waste at the former Scott Paper Company lumber mill (Scott site) in Anacortes. The mill was developed before 1890 by filling along the shoreline of Fidalgo Bay. The site was used for lumber, box making, and pulp production, with processes that resulted in pollution from dioxins and furans, carcinogenic polycyclic aromatic hydrocarbons, and polychlorinated biphenyls. The Remedial Investigation (RI) and Feasibility Study (FS) conducted for the Port by GeoEngineers recommended remediation activities in the upland and marine portions of the site. To avoid affecting potential prehistoric and historic-period archaeological deposits, the Port contracted with Historical Research Associates, Inc. (HRA) to perform a cultural resources assessment. The site is located along the western shore of Fidalgo Bay and bounded by Seafarers' Way to the north, Q Avenue to the west, and approximately 19th Street to the south (Figure 1). It is in the northeast quarter of Section 19 of T35N, Range 2E, and shown on the 1998 U.S.G.S. Anacortes 7.5-minute North quadrangle map.

Figure 2 shows the limits of the project area, while Figure 3a and 3b show the upland areas to be excavated; Figure 4 shows the marine areas to be dredged and capped. Two wave attenuation structures similar to breakwaters are proposed to protect the sediment cap in the marine area from wave action. The existing timber breakwater at the tip of Seafarers' Memorial Park would be removed. These features are in the preliminary design phase, and the Port and MJB (owner of part of the site) are working with the Department of Ecology to finalize the clean-up remedy. The Port believes that the historical shoreline in the area is roughly equivalent to the old BNSF railroad line (currently the Tommy Thompson trail), and that the project area consists of fill placed throughout the twentieth century.

HRA reviewed the RI & FS, researched records at the State Department of Archaeology and Historic Preservation, conducted background research of the area, including the Anacortes Historical Museum, and visited the site. Staff members analyzed the resulting information, which is presented below in sections on the environmental context (2.0), including the site's geomorphic setting, and cultural context (3.0) of the prehistory, ethnography, and history of the site vicinity. After a summary of the research methods and previous cultural resources studies nearby (4.0), the report discusses the potential for historical properties (5.0), including prehistoric archaeological remains, historic-period archaeological remains, buildings and structures, and traditional cultural properties. The report ends with a section on conclusions and recommendations (6.0) and a list of references cited (7.0). Appendix A provides copies of consultation letters the Port sent to the Samish and Swinomish Tribes, and Appendix B contains copies of historical maps of the project area vicinity.

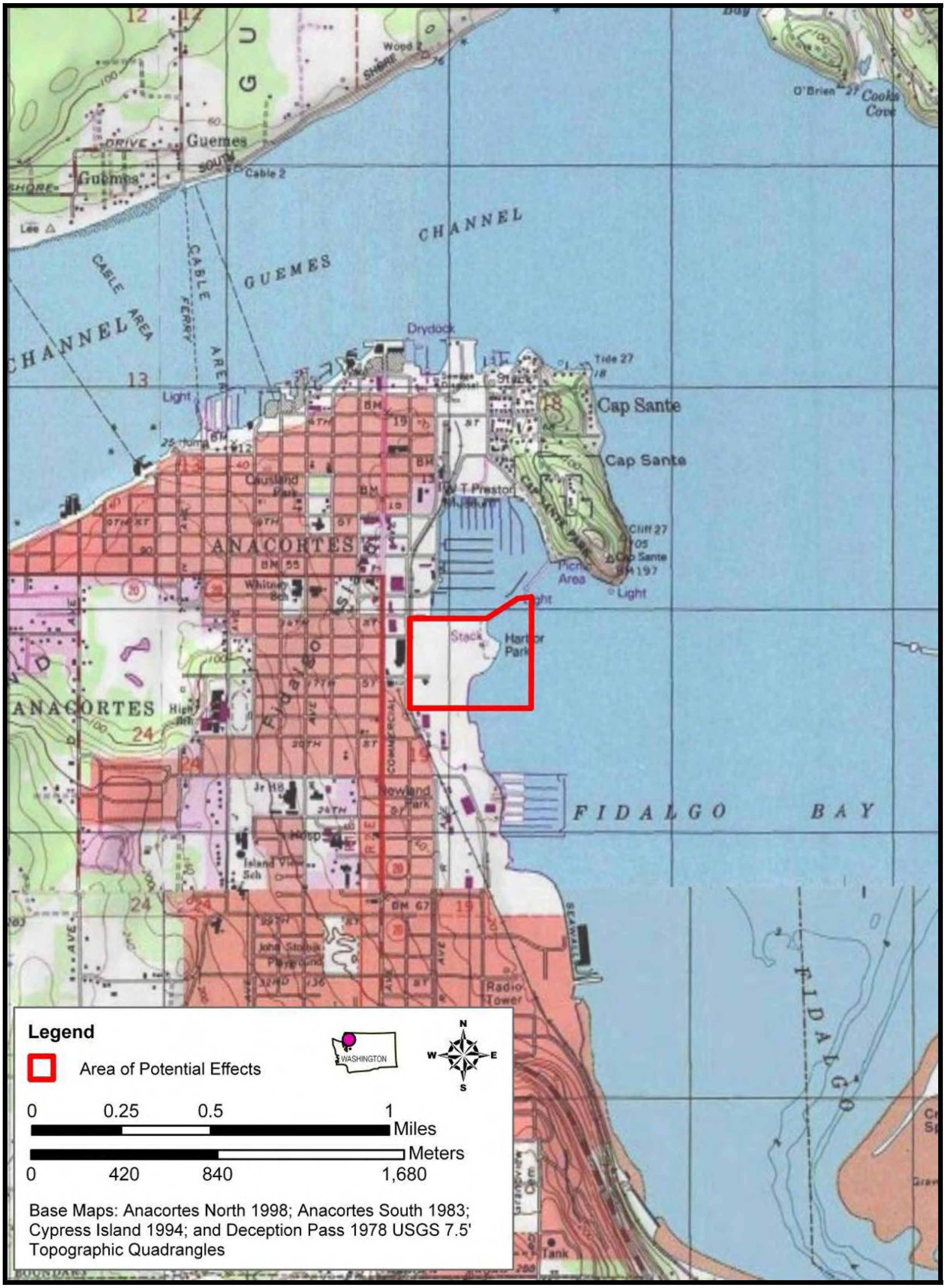

Figure 1. Project location and Area of Potential Effects.

Figure 2. Project area limits.

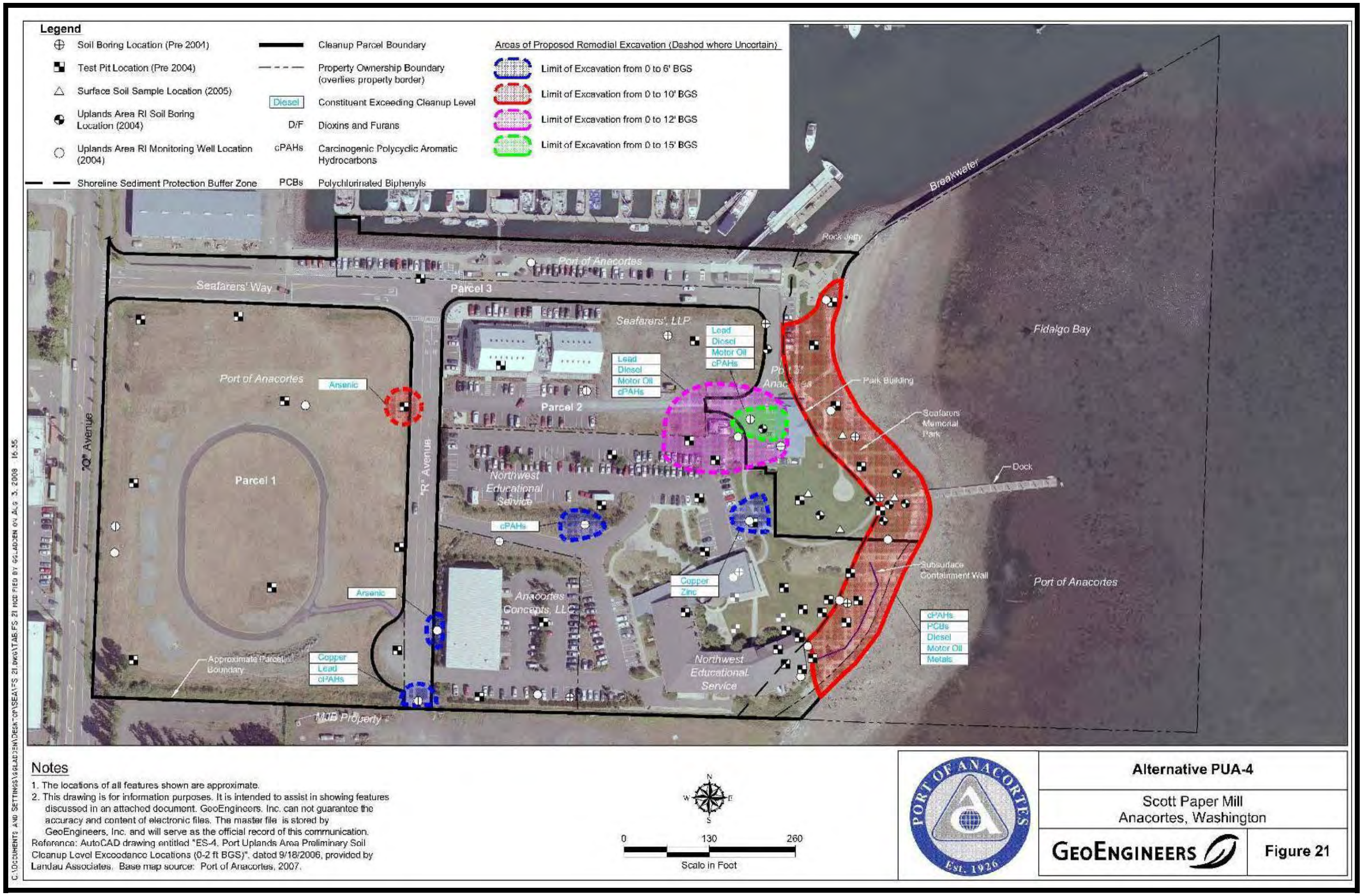

Figure 3a. Port upland areas for remedial excavation.

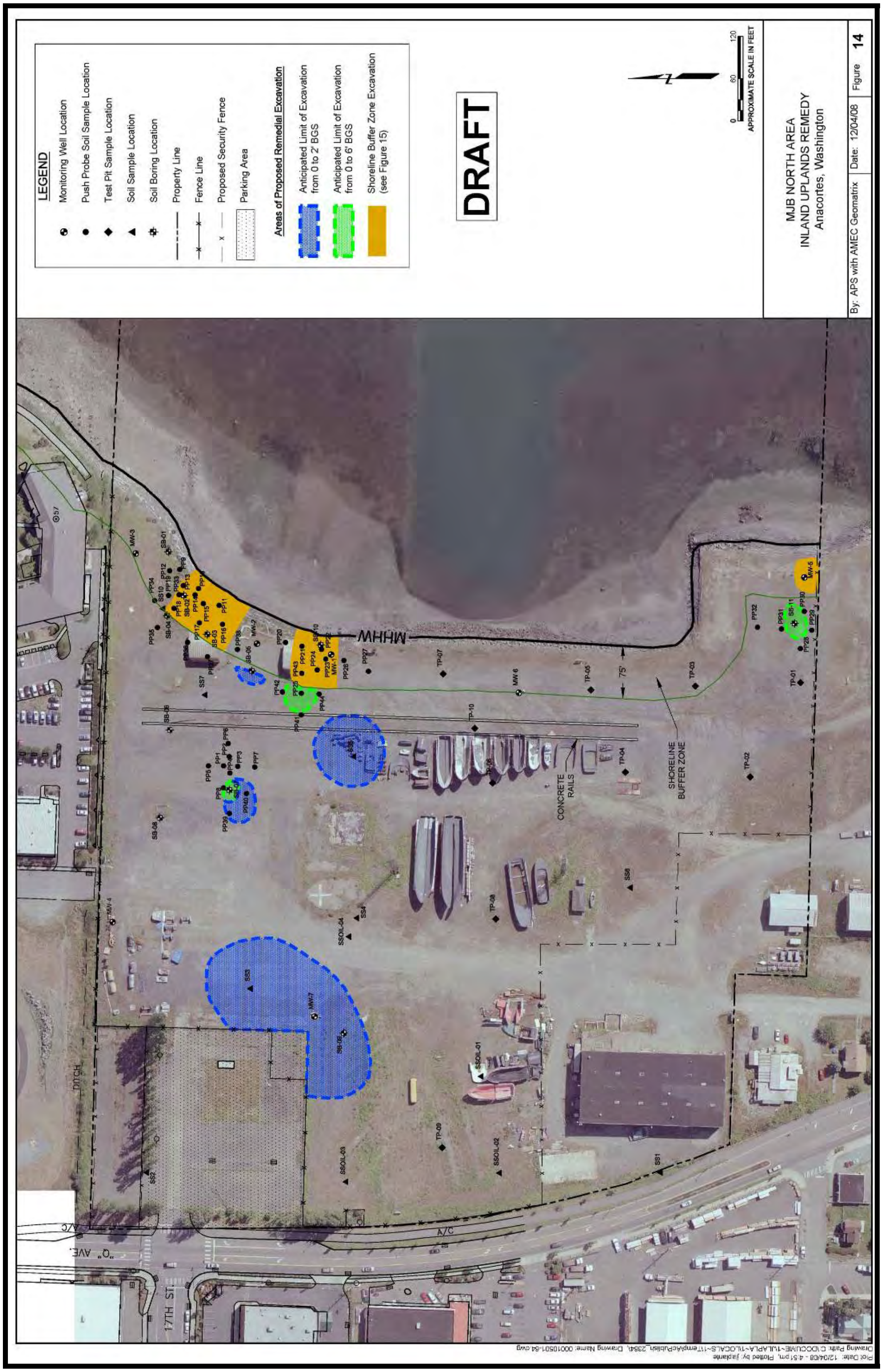

Figure 3b. MJB upland areas for remedial excavation.

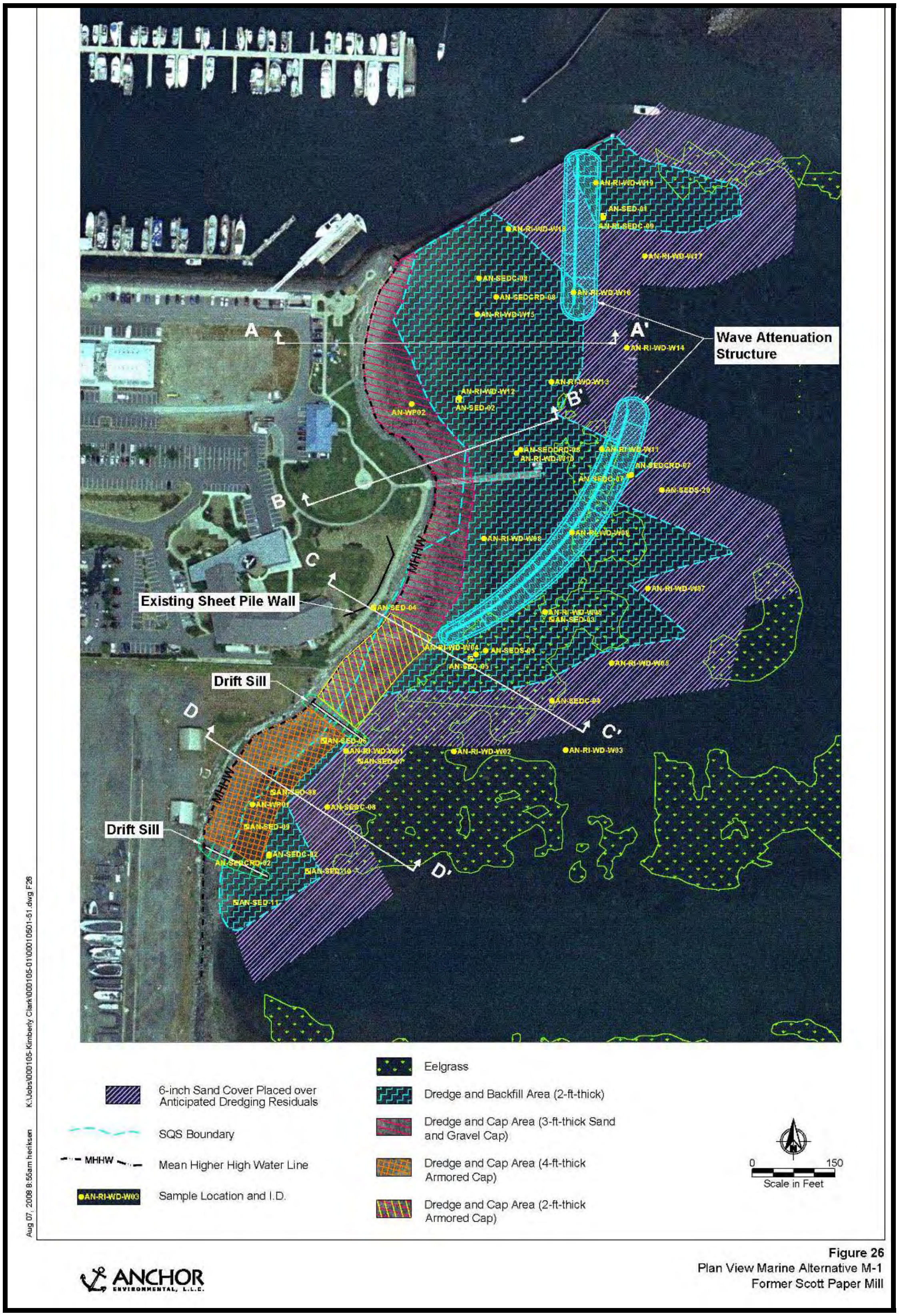

Figure 4. Marine areas for remedial dredging and capping.

Gail Thompson, Ph.D., managed HRA's work and report preparation and analyzed information on the site's prehistoric and ethnographic context; Shari Maria Silverman, M.A., analyzed information on the site's geomorphic setting and potential for prehistoric archaeological remains; and Derek Shaw, M.A., conducted historical research and analyzed information on the site's history and potential for historical remains. The Port consulted with the Samish Indian Nation and the Swinomish Indian Tribal Community regarding concerns about potential archaeological remains and traditional cultural properties.

The project's Area of Potential Effects (APE) consists of the upland and marine areas bordered on the north by Seafarers' Way and the breakwater at the east end of it, on the east by a line (the inner harbor line) extending out from the end of the breakwater and running south to about 1,000 ft (305 m), and on the west by the east side of Q Avenue running north to Seafarers' Way. The APE is comprised of historical fill deposited over the western part of Fidalgo Bay, reaching a depth of 7-10 ft (2-3 m) below ground surface in the western part of the site and about 15 ft (4.6 m) below ground surface near the current shoreline of Fidalgo Bay.

2.0 Environmental Setting

The following sections provide overviews of the natural history of the Scott site project area and include descriptions of the physiography, geology, soils, flora, and fauna. Much of the information is drawn from the Port's previous cultural resource investigations for the Cap Sante Marine clean-up site, located just north of the Former Scott Paper Site (Gilpin and Thompson 2008; Goetz et al. 2007)

The project area is situated between 0 and 20 feet (ft) (6.1 meters [m]) above mean sea level (amsl) on Fidalgo Island, at the northwestern corner of Fidalgo Bay. Fidalgo Island is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973). The geomorphology of this region, carved out in the Late Pleistocene by repeated advances and retreats of continental glaciers and their outwash, is generally characterized by steep-sided valleys containing low-gradient rivers, streams, and creeks; and small lakes, marshes, and other wetlands, both permanent and seasonal, along the shoreline and farther inland (Booth et al. 2004; Franklin and Dyrness 1973). Within the region, however, specific locales vary widely in appearance, based on both environmental and human post-glacial impacts.

During the most recent glacial episode, the Fraser Glaciation (approximately 19,000 to 16,000 years ago), the region surrounding the project area was scoured and covered by the Puget Lobe of the Cordilleran Ice Sheet. By 12,500 years ago, the glaciers had retreated completely from the region surrounding the project area (Booth et al. 2004). Landforms around and north of Puget Sound responded through rapid isostatic rebound, taking the next several thousand years to achieve equilibrium with sea levels (Beechie et al. 2001; Dethier et al. 1995; Thorson 1981; Waitt and Thorson 1982). Even after equilibrium was reached, sea levels continued to rise until around 5,000 years ago, covering once bare lands near the coastlines (Thorson 1981). Tectonic activity has affected local shorelines in recent times, lifting some and lowering others.

The sediments within the project area itself have been mapped as "Xerorthents": stratified, extremely gravelly, sandy loams that have been transported or otherwise disturbed by human action. Soils within the vicinity of the project area include sediments of the Clallam-Urban and

Bow-Urban series. Initially formed in glacial drift and glaciolacustrine deposits, these soils are generally gravelly to very gravelly loams. The Urban portion denotes the fact that these sediments have been stripped of the majority of their native vegetation (plants within the Western red cedar vegetative zone; Franklin and Dyrness 1973) and largely modified with coverings of streets, buildings, and other historic-period and modern construction efforts (Klungland and MacArthur 1989; Soil Survey Staff 2008).

The Scott site vicinity supported diverse floral and faunal resources. The dominant vegetation province in the Anacortes portion of the Puget Sound area is the western hemlock (*Tsuga heterophylla*) zone, with a plant association that includes Douglas fir (*Pseudotsuga menziesii*) and western red cedar (*Thuja plicata*). Western white pine (*Pinus monticola*) and lodge-pole pine (*Pinus contorta*) are also common in the Puget Sound area. In disturbed locales, red alder (*Alnus rubra*) often is the first species to become established after the removal of coniferous forest. Big-leaf maple (*Acer macrophyllum*) and Douglas fir are additional successional species. Understory species commonly found in the project vicinity include swordfern (*Polystichum munitum*), bracken fern (*Pteridium aquilinum*), Oregon grape (*Berberis nervosa*), vine maple (*A. circinatum*), huckleberry (*Vaccinium* spp.), berry vines (*Rubus* spp.), creambush ocean-spray (*Holodiscus discolor*), salal (*Gaultheria shallon*), and twinflower (*Linnaea borealis*) (Franklin and Dyrness 1988).

Historically, deer (*Odocoileus* spp.), elk (*Cervus canadensis*), black bear (*Ursus americanus*), cougar (*Felis concolor*), and coyote (*Canis latrans*) lived in the vicinity of Anacortes. These mammals have extensive ranges and were common in both bottomland and uplands. Marshy habitats in the vicinity have supported raccoon (*Procyon lotor*), ermine (*Mustela erminia*), beaver (*Castor canadensis*), river otter (*Lutra canadensis*), marten (*Martes americana*), and muskrat (*Ondatra zibethicus*) (Dalquest 1948). The inlets, bays, and straits around Fidalgo Island support a number of marine mammals, including harbor seal (*Phoca vitulina*), harbor porpoise (*Phocoena phocoena*), Dall’s porpoise (*Phocoenoides dalli*), and killer whale (*Orcinus orca*) (Dalquest 1948).

Fidalgo Bay and its mudflats support Pacific herring (*Culpea pallasi*), surf smelt (*Hypomesus pretisus*), and Pacific sand lance (*Ammodytes hexapterus*), as well as juvenile salmon and Dungeness crab (*Cancer magister*) (Washington State Department of Natural Resources 2007). Shellfish include geoduck (*Panopea abrupta*), butter clams (*Saxidomus gigantean*), and the native Olympia oyster (*Ostrea conchaphila*) (Harbo 2001). Anadromous fish include Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), winter steelhead (*O. mykiss*), and sea-run cutthroat (*Salmo clarki*) in the Skagit River (StreamNet 2007; Washington Department of Fish and Wildlife 2007). The Samish River supports Chinook, coho salmon, and sea-run cutthroat, as well as chum salmon (*Oncorhynchus keta*).

Various birds inhabit the project vicinity on an annual or seasonal basis. Species include bald eagle (*Haliaeetus leucocephalus*), great blue heron (*Ardea herodias*), raven (*Corvus corax*), mountain quail (*Oreortyx pictus*), purple martin (*Progne subis*), mallard (*Anas platyrhynchos*), goldeneye (*Bucephala clangula*), bufflehead (*Bucephala albeola*), petrel (*Oceanodroma spp*.), cormorant (*Phalacrocorax spp.*), gulls (*Larus spp*.), and pigeon guillemot (*Cepphus columba*) (Suttles 1990).

3.0 Cultural Context

3.1 Prehistory

Most current archaeological research indicates that people have lived in and utilized the resources of western Washington more or less continuously from approximately 11,000 years ago. Researchers have created several chronological sequences that describe the timing and nature of cultural change in the Pacific Northwest. Ames and Maschner's (1999) chronological sequence is divided into five prehistoric developmental periods: Paleo-Indian, Archaic, Early Pacific, Middle Pacific, and Late Pacific. The archaeological evidence from these periods suggests a gradual shift from small nomadic groups relying on generalized hunting and gathering to larger sedentary groups with increased social complexity and specialized reliance on marine and riverine resources (Ames and Maschner 1999:6).

Earlier artifacts in the region include chipped stone tools such as large fluted projectile point, leaf-shaped projectile points, and cobble tools associated with core, flake, and blade technologies. Early archaeological sites are often found on river terraces or upland plateaus, indicating that subsistence may have emphasized inland hunting with supplemental use of fish and shellfish. Some early sites in coastal areas may have been inundated as a result of postglacial relative sea level rise.

Over time, stone projectile points decreased in size and notched forms came into use. Ground stone, bone, and antler technologies also appeared. Archaeological sites, including shell middens that reflect seasonally used villages, are found along the contemporary marine shorelines, with subsistence remains reflecting the use of salmon, shellfish, and sea mammals.

Most recently, artifacts include small stone projectile points, although bone and antler tools for fishing became far more numerous than stone tools. Very late archaeological sites contain trade goods imported from the Columbia Plateau as well as metal tools and trade beads from Euro-Americans. Salmon supported an elaborate winter-village settlement, with specialized harvesting by spring trolling at marine passes, summer reef-netting along rocky shorelines, and fall weir fishing along the lower rivers. Plant gathering and terrestrial hunting supplemented the use of fish and shellfish.

3.2 Ethnohistory

The project area is located in the traditional territories of the Samish Indian Nation (Samish) and the Swinomish Indian Tribal Community (Swinomish). Both peoples are identified with the Coast Salish linguistic and culture area. The Samish occupied Samish, Guemes, Fidalgo, Cypress, and Lopez Islands, while the Swinomish occupied Smith Island, Hat Island, located in Similk Bay and northern Skagit Bay, and portions of Whidbey Island (Spier 1936; Swanton 1952; Suttles 1951; Suttles and Lane 1990).

Suttles (1951:42) shows the location of a Samish winter village on Guemes Island, on the northern shore of Guemes Channel, west of the ferry landing. In 1792, Spanish explorers reported two large houses standing on the northwest point of the channel. Conditions became crowded there, and some of the people moved across the channel to a village called “ironwoods” in the Straits Salish language, on the northern shore of Fidalgo Island.

Another village called "camas" was located at the eastern end of the railroad bridge across Fidalgo Bay, at the place that later became the town of Fidalgo. Although the Samish abandoned that village in the 19th century, they continued camping there when gathering camas on the prairie around the head of the bay (Suttles 1951:44). Swanton (1952:437) lists a Samish village named *Hwaibathl* at Anacortes, but this location does not match the far more detailed information that Suttles reported.

Subsistence focused on seasonal harvests of salmon, including sockeye, coho and Chinook, and shellfish, including butter clams, littleneck clams, horse clams, geoduck, Olympia oysters, mussels, snails, and barnacles (Haeberlin and Gunther 1930; Suttles and Lane 1990). Salmon were caught using trolling hooks at narrow passes in spring, reef nets along rocky shorelines in summer, and spears at river fish traps in fall (Haeberlin and Gunther 1930; Suttles and Lane 1990). In addition to marine resources, plants and berries were gathered including camas, hazelnuts, red elderberry, blackberries, salmonberries, thimble berries, dandelion roots, wild carrot, onion and wapato (Haeberlin and Gunther 1930). Hunting land mammals provided a large share of food for these groups; men specialized in the pursuit of deer, elk, bear, and beaver (Haeberlin and Gunther 1930; Suttles and Lane 1990).

Winter villages included one to several plank houses, constructed of cedar boards lashed to large posts by ropes made from inner cedar bark. Multiple families resided within these houses, forming a complex community structure. Religious ceremonies were held in the main winter house during these months, while satellite structures housed curing facilities for salmon and other fishes and meats. Time was taken during the two to four months of winter weather to repair tools and manufacture new objects for use during the year (Suttles 1951, 1990).

The Samish and Swinomish traveled to seasonal camps in the island uplands or the mainland during the spring, summer, and fall to fish, hunt, gather plant resources, visit, and trade (Suttles 1951, 1990). Shelters were light and portable, constructed of reed mats and poles. Salmon, meats, berries, and other foodstuffs were cured and dried at or near these camps through the summer and early fall. Plants were collected by the Samish and Swinomish not only for food (e.g., berries and roots were processed, dried, and stored for later consumption), but also for technological (e.g., clothing, rope, and building materials), and medicinal uses (Gunther 1945; Haeberlin and Gunther 1930).

The expansion of Euroamerican traders, missionaries, and finally settlers into the region surrounding the project area, largely in the early to mid-1800s, changed and even eliminated several of the lifeway patterns described above. In 1855, both the Samish and Swinomish people signed the original Treaty of Point Elliott, and were assigned to reservations (the Swinomish to their own, and the Samish to the Swinomish and Lummi Reservations). Through the late 19th and early 20th centuries, the Samish and Swinomish continued to hunt and fish, and they also worked in the growing farming, logging, and milling industries (Cole and Darling 1990).

As discussed above, Indian villages were located in the general vicinity of the project area (Swanton 1952:437). The geographer T. T. Waterman (see Hilbert et al. 2001) noted several ethnographic place names in the vicinity of the project area, including *K!aix* for "a promontory at the town of Anacortes" (Cap Sante) and *Dugwa’l tc*, “protected place where there is calm water,” for Fidalgo Bay (Hilbert et al. 2001:349, 351, 354). Suttles' (1951:42) map of Samish territory shows no place names near the project area. Other than the name for Fidalgo Bay, HRA's research located no Native American place names for the project area.

3.3. History

Although British Captain George Vancouver's expedition into Puget Sound in 1792 marks the earliest undisputed record of direct Euroamerican interaction in the region, their influence was likely felt long before. New and lethal diseases, along with trade goods, appeared before the early Euroamericans, impacting the local populations as early as the 1500s (Campbell 1989). The historic context of the project area vicinity began in the 1860s, when Euroamericans began to settle in the Anacortes area, calling it "Ship Harbor." In 1876, Amos Bowman, credited with changing the town's name to "Anacortes," claimed 168 acres. He soon established a store and newspaper and constructed a wharf. By 1882, several additional businesses were present in the town, including a scow building, wagon shop, blacksmith, carpet weaving shop, notary public, and ship builder (Inter-State Publishing Company 1906).

Anacortes was platted in 1890, immediately following an economic boom that anticipated the area would be the terminus of the James J. Hill's Northern Pacific Railroad (NPR). The Oregon Improvement Company, the largest company then operating in the Pacific Northwest, took the lead in this enterprise, starting a railroad linking Anacortes to the Skagit Valley. Unfortunately, Tacoma was selected as the NPR terminus, and the Anacortes economy faltered by 1891. Two years later, Anacortes and the rest of the United States suffered the panic of 1893 (Wollam 1967:1, 4, 14). Fortunately, however, businesses recovered through the decade, as the establishment of the fish cannery industry in town paved the way for various ventures, including two codfish plants, six salmon canneries, nine fisheries, three sawmills, seven shingle mills, a planing mill, a creamery, and a fruit cannery (Dwelly and Dwelly 1979; Inter-State Publishing Company 1906). Particularly relevant to the development of the project area vicinity is the lumber milling industry.

At least two railroad lines were operated in the Anacortes vicinity at the turn of the 20th century. The Burlington Northern Santa Fe (BNSF) line, running west of the project area, operated from 1890 to the late 20th century (Hodges 2003a&b). The Great Northern Railroad constructed a line through Anacortes in the late 1800s, and by 1905, a spur ran from the vicinity 0f 23rd Street north along R Avenue to the project area.

For many years, as in other parts of the Pacific Northwest, the logging and milling industries dominated Anacortes' economy. The first sawmill on Fidalgo Island was established at Deception Beach in 1878. Within a few years, several more operational sawmills and lumber and box-mills were established in Anacortes, both along the Guemes Channel and on the western and southern sides of Fidalgo Bay (Slotemaker n.d.:6-7). The closest major mills to the project area were located at the foot of 15th and 16th Streets at their intersection with R Avenue. Table 1 outlines the succession of saw-, shingle-, and lumbermills at this location, while Section 5.1 below discusses the history of the project area mill complex.

Table 1. Major Lumber Mills Operating in the Vicinity of the Intersection of R Avenue, at the Foot of 15th to 16th Streets (adapted from Slotemaker 2007:91; n.d.:10)

Name	Dates of Operation	Focus
Griffin Mill	ca. 1881-1930s	Shingles, lumber
Skagit Mill Co. (Skagit Manufacturing Company)	ca. 1890-1903	Shingles
English McCann Mill (Clothier and English)	1891-1892	--
W. M. Rodgers Sawmill and Box Factory	ca. 1894-1907	Lumber and box
Old Oregon Lumber Company	1907-1916	Lumber and box
Morrison Mill	1918-1947	Lumber and box
Ozette-Morrison Spruce Company (re-organized in 1947)	1947-1954	--
Morrison Mill (operated briefly)	1955	Lumber and box

4.0 Background Research and Archaeological Expectations

The following sections discuss the background research and its findings including previous cultural resources studies within about one mile (1.6 km) of the project areas along with recorded archaeological sites as well as historical buildings and structures. The section ends with a description of the types of archaeological resources that could be expected in the vicinity of the project area.

4.1 Background Research

HRA staff conducted research at the State Department of Archaeology and Historic Preservation (DAHP), the Anacortes Historical Museum, HRA’s Seattle office, and online to assemble information on the environmental and cultural context, previous cultural resources surveys, and recorded archaeological and historical cultural resources in the vicinity of the project area. We also contacted Ms. Tracy Patton of the Skagit County Public Works Department regarding her collection of historical maps of the area.

4.2 Previous Cultural Resources Studies

Six cultural resources surveys have been conducted within about one mile (1.6 km) of the project area (Table 2). A cultural resources survey investigating the SR 20-R Avenue Interchange and East Bound On-Ramp was conducted by Joan M. Robinson (1990). She concluded that no significant cultural resources would be affected by the project, as most of the project area was previously disturbed by road building and house construction. The report noted that several old businesses and houses remained in the project area, although most were not old enough to be listed in the National Register of Historic Places (NRHP), or they did not meet criteria other than age to be eligible to be listed in the NRHP. One home was documented and photographed; a review by the State Office of Archaeology and Historic Preservation noted that the house was not eligible for listing in the NRHP because it was "not a significant example of its type or period of architecture, and is not known to be associated with significant persons or events" (Robinson 1990).

Table 2. Previous Cultural Resources Studies Within About 1 Mile (1.6 km) of the Scott Site APE.

Author(s)	Date	Title	Cultural Resource Identified	Eligibility Status*
Robinson, Joan M.	1990	*A Cultural Resources Survey of SR 20: R Avenue Interchange and East Bound On-Ramp, Anacortes, Skagit County, Washington*	None	Not Applicable
Goetz, Linda Naoi, Kara M. Kanaby, and Douglas F. Tingwall	2007	*Cultural Resources Report Cap Sante Marine Interim Action Project, Skagit County, Anacortes, Washington*	None	Not Applicable
Johnson, Sarah E.	2007	*Letter to Stephenie Kramer RE: Monitoring of an Excavation by the City of Anacortes Parks Department*	None	Not Applicable
Thompson, Gail	2008	*Archaeological Monitoring Plan for the Port of Anacortes Pier 1 Redevelopment Project Skagit County, Washington*	None	Not Applicable
ICF-Jones & Stokes	2008	*Cultural Resources Survey Report Anacortes Ferry Dock Embankment Rip-Rap Replacement Project, Skagit County, Washington*	None	Not Applicable
Gilpin, Jennifer, and Gail Thompson	2008	*Archaeological Monitoring at the Port of Anacortes Cap Sante Marine Interim Action Project, City of Anacortes, Skagit County, Washington*	45SK371 – remains of USACE bulkhead dating 1929-1950s	Recommended not eligible†

*National Register of Historic Places and Washington Heritage Register
†Author's Opinion

In 2007, Landau Associates conducted a cultural resources survey for the Port of Anacortes' Cap Sante Marine clean-up project area. The project consisted of geotechnical borings to identify the extent of soil contaminated with "gasoline-range petroleum hydrocarbons and associated constituents" (Goetz et al. 2007). Although the sediments included sands with shell fragments and decomposing wood remnants, no cultural resources were identified during this project. Soils in the project area were determined to be asphalt and/or concrete-covered fill soils, partially from dredged material that was removed from the federal channel during the 1940s and 1950s. Goetz et al. (2007) noted that although no cultural resources were observed during monitoring of geotechnical borings, cultural material could exist in native sediments underneath the fill soils, leading to the recommendation of archaeological monitoring during additional ground disturbing work.

HRA conducted archaeological monitoring of the Cap Sante Marine clean-up project in the fall and winter of 2007 (Gilpin and Thompson 2008). An archaeologist monitored the removal of contaminated soils surrounding two former underground storage tanks. The work recorded one archaeological site (Site 45SK371, a former USACOE bulkhead [Gilpin 2008]). The site was characterized by pilings and associated features observed in dredged fill soils, as well as loose fragments of wood, glass fragments, and a rubber tire inner tube and tire fragment. Due to previous disturbance, it was determined that the bulkhead pilings and associated features did not retain integrity of setting, feeling, and association necessary to be eligible for listing in the NRHP (Gilpin and Thompson 2008).

In 2007, Sarah Johnson, Cultural Resources Program Manager for the Samish Indian Nation, monitored the City of Anacortes Parks Department's excavation of a concrete footing. The monitoring report identified no cultural resources (Johnson 2007).

ICF-Jones & Stokes was contracted by Anchor Environmental, LLC on behalf of the Skagit County Public Works Department in May 2008 to survey a proposed area for replacement of the existing embankment near the Guemes Ferry Dock (ICF-Jones & Stokes 2008). No previously recorded archaeological sites or historic buildings and/or structures were identified during the records search or fieldwork. Due to the proximity of the project area to a known site (45SK294, a shell midden located approximately 30 meters west of the Guemes Ferry Dock), a moderate probability for previously unidentified and intact cultural resources was determined for the project area vicinity. No cultural resources were identified during pedestrian survey and shovel probe testing (ICF-Jones & Stokes 2008).

In February 2008, HRA prepared a monitoring plan and inadvertent discovery plan to the Port of Anacortes, for the redesign of Pier 1 (Thompson 2008). A review of cultural resources studies, including a Supplemental EIS from 2003, formed part of the background research for the project. No prehistoric or historic cultural resources were identified in the Pier 1 Redevelopment Project APE (Thompson 2008a).

Four overview studies have been completed within the general vicinity of the Scott site (Table 3). Three of these studies discuss local Coast Salish tribes' cultural activities and probable associated artifacts and features (Blukis Onat 1987; Easton 1982; Greengo 1983). In particular, Blukis Onat (1987) discusses site locations and artifact types, providing a predictive model or framework for what to expect in certain topographic areas. Greengo (1983) also looks at spatial and temporal settings in relation to expected archaeological sites, artifacts, cultural settlement and subsistence patterns of groups on the Southern Northwest Coast as a whole. Easton (1982) examines the connection between social structure and reef-netting as a mode of production. Shipman (1989), by contrast, analyzes the effects of plate tectonics, other geological processes, and relative sea level changes as a part of "vertical land movements," which could have shaped past settlement and site patterns, and whether or not cultural materials would be submerged beneath present day shorelines.

Table 3. Overview Studies in the Project Area Vicinity.

Author(s)	Date	Title	Description
Easton, Norman	1982	*Straits Salish Reef-netting and Social Structure: a Test Case in Economic Anthropology*	Discussion of reef-netting as a mode of production and how this would be a critical point for the economic structure of Straits Salish groups
Greengo, Robert E.	1983	*Prehistoric Places on the Southern Northwest Coast*	Several short essays on the distribution of prehistoric sites and the associated cultural affiliations and traditions
Blukis Onat, Astrida R.	1987	*Resource Protection Planning Process Identification of Prehistoric Archaeological Resources in the Northern Puget Sound Study Unit*	Temporal and spatial overview of environmental and cultural factors in the Northern Puget Sound

Author(s)	Date	Title	Description
Shipman, Hugh	1989	*Vertical Land Movements in Coastal Washington: Implications for Relative Sea Level Change*	Analysis of geologic processes, namely plate tectonics, isostatic rebound, subsidence, and uplift, on the shorelines of Washington, with discussion on how changes in sea level can affect old shorelines and archaeological sites

4.3 Historical Buildings and Structures

Table 4 provides information on nine historic buildings and structures that have been identified within about one mile (1.6 m) of the Scott site. The snagboat *W.T. Preston* is listed in the National Register of Historic Places, and the Fraternal Order of Eagles Anacortes Aerie #249 is listed as a City of Anacortes Historic Landmark. None of the nine properties are located within one block of the project area.

Table 4. Previously Recorded Historic Building and Structures Within 1 Mile (1.6 kilometers) of the Scott Site APE.

Author(s)	Date	Title	Cultural Resource Identified	Eligibility Status*
Washington State Historic Preservation Inventory Project	1974a	*Anacortes Carnegie Library (45SK162), Washington State Inventory of Historic Places Form*	Two-story brick building with massive, classically-designed portico with inset columns and decorative capitals at entryway	(Probably) Eligible ✝
Washington State Historic Preservation Inventory Project	1974b	*Harry Causland Memorial Park and Bandstand (45SK163), Washington State Inventory of Historic Places Form*	Park that covers a city block, with associated bandstand. Bandstand is round with a sloping roof supported by large rock columns-a unique feature in the Pacific Northwest	(Probably) Eligible ✝
Koler	1987a	*Great Northern Depot (45SK262), National Register of Historic Places Registration Form*	Tudor style, wood frame railroad depot built in 1911 and operated until 1957 for passenger and freight use,	Eligible ✝
Koler	1987b	*California Fruit Store (45SK264), National Register of Historic Places Registration Form*	Commercial two-story wood frame building with a false front parapet with a bracketed cornice, storefront, and box bay window, built circa 1900	(Probably) Eligible ✝
Koler	1987c	*Semar Block (45SK265), National Register of Historic Places Registration Form*	Commercial two-story brick building constructed in 1891, with embellished Victorian elements	Eligible ✝

Author(s)	Date	Title	Cultural Resource Identified	Eligibility Status*
Koler	1987d	*Marine Supply and Hardware Complex (45SK266), National Register of Historic Places Registration Form*	Complex of four turn-of-the-century commercial buildings-three constructed of wood, the other of brick and concrete; all built prior to 1907	(Probably) Eligible ✝
Unknown(a)	1987	*Wilson Hotel (45SK298), Historic Property Inventory Form*	Three-story brick Queen Anne-style commercial building built in 1890	Eligible ✝ (as stated on a revised form 10-3-03)
Delgado	1988	*Snagboat W.T. Preston (45SK259), National Register of Historic Places Registration Form*	Snagboat built in 1939, previously operated by the USACOE, now used as a museum in a permanent dry-berth exhibit on Anacortes shoreline	Listed in NRHP in 1972
Unknown(b)	2000	*Fraternal Order of Eagles Anacortes Aerie #249 (45SK273), Washington Heritage Register Form*	Three-story brick-clad building, with stucco façade finish on the foundation/base, and distinctive motifs for the Fraternal Order of the Eagles, by whom it was constructed in 1920	Eligible ✝ - Property is listed by the City of Anacortes as a Historic Landmark Building

*NRHP-National Register of Historic Places

✝-Author's Opinion

4.4 Traditional Cultural Properties

The Port of Anacortes sent consultation letters to the Samish Indian Nation and the Swinomish Indian Tribal Community describing the project and requesting information on potential cultural resources and concerns of the tribes (see Appendix A). Port staff met with Diana Barg, Cultural Resource Program Manager for the Samish Indian Nation on December 16, 2008. Ms. Barg stated that she did not know of specific tribal use of the project area but cautioned that most of the Fidalgo Bay shoreline had likely been used for shellfish harvesting, making the project area sensitive for archaeological remains. As of December 16, 2008, the Port had not received a response from the Swinomish cultural resources representative. As discussed in Section 3.2 above, research into ethnographic place names and historical maps revealed no results for the project area.

4.5 Expectations for Archaeological Deposits in the Project Area

Although intensive development and filling of the historical shoreline since the 1890s could have destroyed or disturbed prehistoric, historical Native American, and Euro-American archaeological resources, it is possible that the project area could contain archaeological deposits. The project's location in the shallow tidelands near the shoreline of Fidalgo Bay suggests that prehistoric archaeological materials associated with occupation, shellfish gathering, fishing, and other activities could be present beneath historical fill. Artifacts could include remains that had been dumped into the shallow intertidal waters of the bay, which may include lithic, bone, and shell artifacts as well as the food and technological materials from plants and animals. Remains deposited in water also could contain preserved wood and plant fiber artifacts. The tideland location of the project area also could contain the remains of stone or wood fish weir structures. Human remains and burials, which were typically placed in upland areas, would usually not be expected in previously inundated areas such as the project site.

Artifacts and features also could result from historical activities, which largely would consist of filling the project area as well as building and use of the saw, lumber, and pulp mill complexes, ca. 1892-1970s. The mill complex is well represented in documentary sources and the activities carried out there were common to the region. Unless remains related to Native American, Asian American, or female workers are located, the historic-period archaeological deposits are not anticipated to be important.

5.0 Study Methods and Findings

HRA researched a number of sources to understand the historical use, geomorphology, and condition of the project area to facilitate the identification of cultural resources and their potential eligibility for listing in the National Register of Historic Places. The following sections discuss the methods and findings of HRA's research and analysis.

5.1 Historical Use of the Project Area

HRA staff researched historical documents, maps, and photographs of the project area, including copies of *Anacortes American* newspaper articles at the Anacortes Historical Museum, U.S. Coast and Geodetic Survey charts, Sanborn Fire Insurance Maps, and historical photographs provided by the Port and viewed at the Anacortes Historical Museum.

The 1890 Sanborn map of Anacortes does not show the project area. A hand-drawn U.S. Coast & Geodetic Survey chart dating to 1891 shows an unaltered shoreline located just west of the what is now R Avenue at 17th Street. This map shows a trail running along the shoreline between the Cap Sante area and location(s) south of the project area. The location of this historical shoreline is corroborated by a 1902 U.S. Coast and Geodetic Survey chart. The 1892 Sanborn map shows the Skagit Mill Company facility located primarily on a wharf extending from the shoreline into Fidalgo Bay. This was the first of several names given to the facility before it became known as the Morrison Mill. The 1892 map shows an area just to the north of the mill used for "sawdust and refuse filling," in which mill by-products were already affecting the shape of its shoreline. The 1897 and 1903 Sanborn maps show similar configurations of the mill.

The 1907 Sanborn map shows a shoreline more similar to that of today although it extends somewhat farther north than the contemporary southern boundary of the Cap Sante Boat Haven. While the 1925 Sanborn map shows the Morrison Mill as extending several blocks to the east of R Avenue, it is likely that the fire insurance maps more accurately depict the location of buildings and structures rather than the position of the shoreline. Much of the Morrison Mill and

Scott Paper Anacortes Pulp-Mill stretched over the water. In 1973 the U.S. Army Corps of Engineers produced a map showing the profile of the shoreline and reflecting the extensive filling that took place in the project area from 1891 to the present (Figure 5).

Throughout its more than 75-year history, the mill experienced changes in name as well as growth in the number, size, and complexity of its facilities. Sanborn fire insurance maps record the mill's name as the Skagit Mill Company in 1892 and 1897, manufacturing rough and dressed lumber. Rodger's Saw Mill & Box Factory appears on the 1903 and 1905 maps, followed by Rodgers Lumber Company, "saw, planing mill, and box fact." in 1907. By 1925 it was called the Morrison Mill Company Saw Mill and Box Factory and in 1950, the Coos Bay Pulp Corporation Morrison Mill Division Saw Mill. The mill appears to have maintained its approximate size between 1892 and 1905, while its size increased somewhat by 1907 and considerably by 1925, retaining its larger size in 1950.

On Thursday November 27, 1924 the *Anacortes American* reported that capital and arrangements had been made for the construction of the Fidalgo Pulp Manufacturing mill in what is now the project area, with optimistic investors and speculators including Lewis Muensch, Ossian Anderson, William Morrison and R.S. Talbot. The mill was would benefit from by-products of the Morrison lumber mills and the Fidalgo Lumber & Box Co., waste hemlock and spruce. These waste product materials could be sold to the pulp mill more cheaply than raw lumber and also alleviated the need for the pulp mill to have sawmilling and de-barking machinery on site. The Fidalgo Pulp Manufacturing plant was one of the first to use waste wood instead of raw lumber (*Anacortes American* Dec. 17, 1925). The mill also took advantage of a "plentiful supply of filtered water" that the City of Anacortes was willing to supply, benefiting the City by providing a monthly income.

Planning to open the pulp mill by June 1, 1925, the investors began driving pilings to construct the foundations in January of that year. Work proceeded at a rush pace with the impending arrival of the materials for the 56-foot-tall and 130-ton pulp digester scheduled for early February (*Anacortes American* Jan.8, 1925). The business venture met its goal and proved to be a profitable producer of unbleached sulphite-pulp by the summer of 1925. Fire struck the digester building in November of 1925, but repairs were completed by mid-December in anticipation of an even more profitable year in 1926 (*Anacortes American* Dec. 17, 1925).

By June of 1928 the owners were planning to enlarge and improve the mill based on a desire to increase its production by one-third (*Anacortes American* June 7, 1928). These modifications included vacating R Avenue from south of 17th Street to the southern end of the company's property. Following the vacancy, the mill sought to expand its plant building and pave the area between the mill and the railway line.

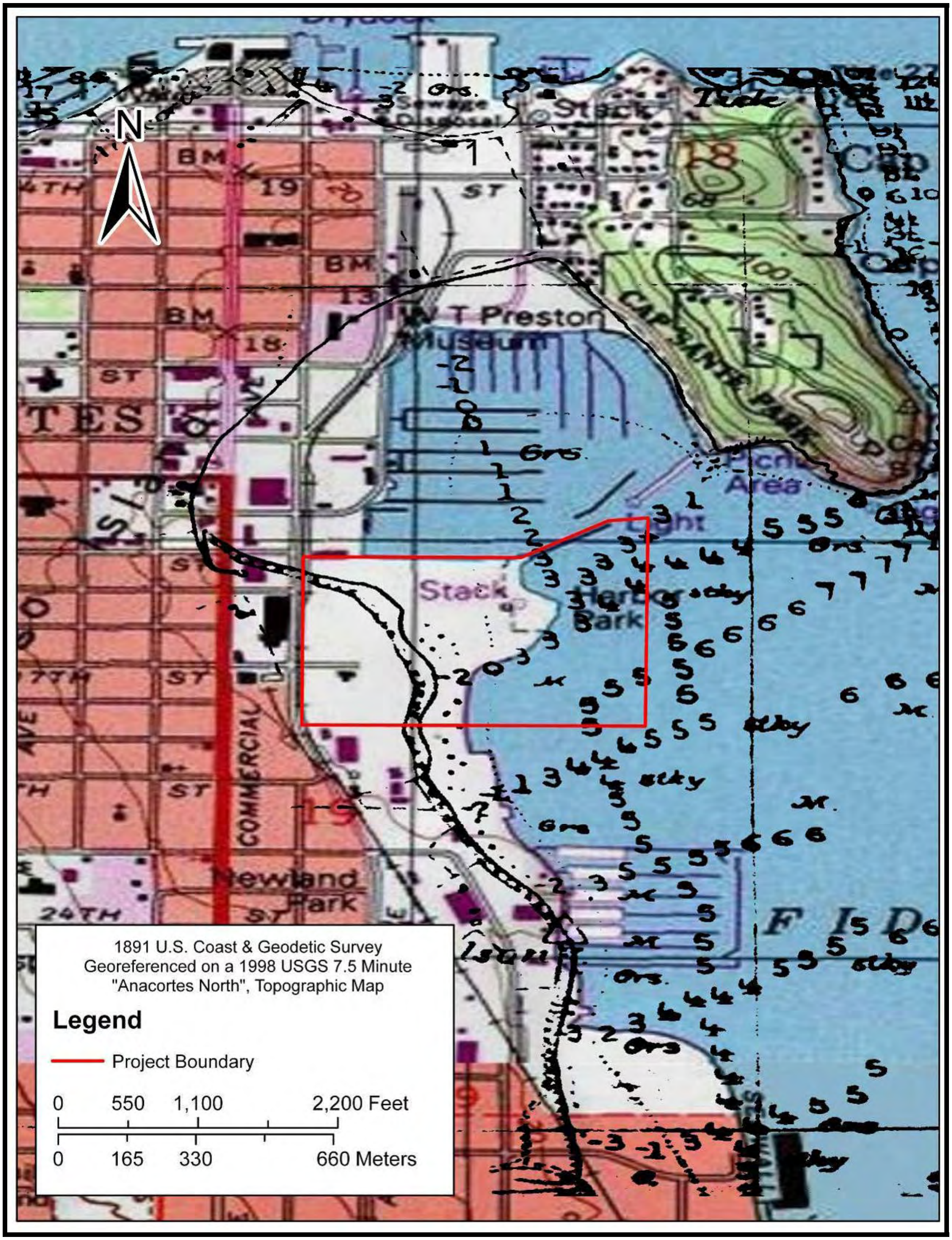

Figure 5. Shoreline changes from 1891 to the present

The mill had been operated successfully for a little over 15 years by the Puget Sound Pulp and Timber Company until early September of 1940, when the Coos Bay Pulp Corporation, a subsidiary of Scott Paper Company, purchased it for $425,000 (*Anacortes American*, Sept. 12, 1940). The sale of the mill, which employed more than 80 workers, was regarded as a positive change for the community of Anacortes. The mill's operation would change from its previous use as a buffer mill, which took up slack in production and filled surplus orders from other mills: the mill would start operating continuously, without long shut-downs. In 1947, the Coos Bay Pulp Corporation, Anacortes Division (Scott Paper Co.) signed a formal agreement to purchase the Morrison Mill (*Anacortes American* Aug. 14, 1947), allowing the business to add steam and lumber processing and control the complete production process "from forest to pulp." Figure 6 shows the mill in operation that year, while Figure 7 shows a contemporary view of the mill site.

Figure 6. View of mill in 1947, looking southwest (courtesy of Port of Anacortes).

Figure 7. Contemporary view of project area, looking southwest.

By late January of 1962, Scott Paper was celebrating a successful decade of its Puget Sound operations (*Anacortes Reporter* Jan. 25, 1962). More than 130 persons were employed at the plant that had enjoyed ongoing commercial success. The January 25th article also details ongoing efforts to improve the plant's effect on the waters of the Puget Sound, both through procedural changes and as part of an ongoing public relations campaign. A relationship between the mill and the City, once realized through the mutual benefits of industrial and urban growth, had deteriorated as government agencies and the public became more concerned about pollution. During the late 1950s and early 1960s, new environmental regulations and public awareness had encouraged Scott Paper's subsidiaries in Anacortes to invest considerable sums into the environmentally compliant retrofitting of its pulp mill. Scott Paper maintained that it had already invested $5,000,000 on improvements meant to improve the plant's overall effect on water quality by 1967 (*Anacortes American* Nov. 21, 1967).

The geography and hydrology of the Cap Sante/Puget Sound vicinity, which had produced such beneficial conditions for the operation of a pulp mill, had now become a detriment as public and agency awareness of the mill's effect on the environment grew. Besides the problems of deepwater effluents, the mill also produced considerable airborne pollutants that were increasingly being seen as a nuisance to the surrounding community. The problem, referred to as "fallout" by the community, was a rain of cinders that fell on the surrounding area as a result of the pulp production (*Anacortes American* Oct. 3, 1968). The installation of a centrifugal separator alleviated much of the "fallout" problem.

In 1968 Scott Paper spent more than $550,000 on plant retrofitting in an attempt to address environmental and fiduciary concerns. Many of the less efficient and labor-intensive processes at the plant were automated, and the number of employees decreased from 126 to 40. For sample, the plant discontinued the use of its wood fuel by-products or "hogged fuel," which had been stoked into furnaces by a crew of 11, replacing this system with natural gas to reduce air pollutants and to save wage-related expenses. A 3,000-cubic-foot chip surge bin was installed to allow pulp materials to be processed more efficiently. The company also moved much of the final pulp processing to its Everett plant and installed a 30-ton chipper (*Anacortes American* Oct. 3, 1968).

During the 1970s the Scott Paper Company continued to improve the mill, spending millions of dollars to keep up with increasingly strict environmental air and water regulations, while still remaining commercially viable. The company spent $65,000 on an air pollution control project to reduce its sulfur dioxide emissions by 50 percent and $100,000 to improve water quality controls in 1972 (*Anacortes American* 1971, 1972-the rest of the references have the entire date). The same year, the company and the City became entangled in a lawsuit over the price of the water that the latter had long supplied (*Anacortes American* Jan. 20, 1974). The result was an 83 percent increase in the cost of water that the plant used. Nevertheless, the Scott Paper Company reported an increase in overall profits in 1974 (*Anacortes American*, April 24, 1974).

The mill shut down on March 24th 1978, removing 79 employees and about one million dollars from the community. Most of the employees were transferred to Scott Paper's facility in Everett. The onsite industrial apparatus was transferred to other Scott Paper sites or sold, and the property was put up for sale (*Anacortes American* March 29, 1978). In May of 1978 a 5.29-acre parcel was sold to the Port of Anacortes and by December of 1978 the rest of the mill property was being sold to others (*Anacortes American* Dec. 13, 1978).

5.2 Project Area Geomorphology

HRA staff researched various sources of information to better understand the project area's geomorphology and potential for intact prehistoric and historic-period archaeological resources. These sources included in the project area Remedial Investigation (RI), which GeoEngineers et al. (2008) prepared for the Port, and the State Department of Natural Resources geology and ground water website, which led to other online sources. These included the Georgia Basin - Puget Sound Research Conference website and the Skagit River System Cooperative website. An HRA project archaeologist analyzed this information to understand the nature and age of deposits across the project area, including processes of deposition, removal, erosion, and stability.

The project area is situated on filled-in or dredged former shallow tidelands. Currently, the area is both above and below mean lower low water (MLLW). Both the fill and dredged areas have multiple histories, associated with specific events that took place on individual parcels. The following sections discuss the Port Upland Area, Port Marine Area, MJB Upland Area, and MJB Marine Area.

5.2.1 Port Upland Area

The majority of the Port Upland Area is located on former shallow tidelands. Before 1800, the project area contained a pocket estuary directly north of the Port Upland Area. Since then, multiple layers of historical fill have been deposited on top of native glacial deposits and marine sediment, and the pocket estuary no longer exists (McBride and Beamer 2007). Surficial soils consist primarily of recent gravel and sand fill, occasionally mixed with wood debris (GeoEngineers et al. 2008:5). In 1994, dredged sand from Swinomish Channel was used as a geotechnical load in the Port Upland Area (GeoEngineers et al. 2008:4). In 1995, this preload material was shifted, and combined with wood waste and bark remnants from the log storage yard used between 1990 and 1993 in Parcels 1 and 2 (GeoEngineers et al. 2008:4).

The eastern half of Parcel 1 contains fill 15 ft (4.6 m) thick or greater, but this fill ranges from 7 to 10 ft (2-3 m) thick on the parcel’s western half. The fill’s upper 5 ft (1.5 m) consists mostly of dark gray sand with silt. Underlying the top layer, the fill contains primarily wood debris, such as sawdust, wood chips, and lumber, but also some metal debris and wire mixed in. In the parcel’s center, the wood debris overlies a thin layer of gravel, which is directly above native gray, very stiff silt. Elsewhere in the parcel, the wood debris directly overlies the native gray, very stiff silt layer (GeoEngineers et al. 2008:26). Between 1990 and 1993, soil was imported from the Anacortes treatment works property to replace wood bark that had been removed from Parcel 1. This replacement material allegedly consisted of dredged materials from the U.S. Army Corps of Engineers (USACE) expansion and dredging of the Cap Sante Marina in 1968 (GeoEngineers et al. 2008:4). From 1990 to 1993, the area was used as a log storage yard (GeoEngineers et al. 2008:4), so some of this debris may date from this time. Soil was removed and a sheet pile wall was constructed in Parcel 2 between 1998 and 2000 (GeoEngineers et al. 2008:4).

Parcel 3 soil generally consists of silty, gravelly sand fill overlying black, sandy silt fill, which occasionally contains wood debris. The thickness of the fill and its individual layers varies widely. The lower black, sandy silt fill may have been placed on the parcel as a preload in 1994.

Its thickness ranges from 6 ft (1.8 m) to 11.5 ft (3.5 m) in the eastern portion of the parcel. The black, sandy silt fill overlies a layer of wood debris consisting of sawdust, wood chips, and lumber. Along Seafarers' Way and R Avenue, wood debris thickness ranges from 8.5 ft to 10.5 ft (2.6 – 3.2 m). The wood debris generally lies directly on top of native gray silt, which was encountered at 21 ft (6.4 m) below ground surface (BGS) in soil borings and soil test pits conducted by Advanced Soil Mechanics in 1993 and Earth Tech in 1998 (GeoEngineers et al. 2008:26).

5.2.2 Port Marine Area

The marine area is located along Fidalgo Bay's western shoreline. The northern portion of Fidalgo Bay is relatively deep, greater than 60 ft (18.3 m below MLLW, although the harbor adjacent to the project area is much shallower). The shoreline consists of fill materials including riprap, debris, piling, sheet piling, concrete bulkheads, docks, and piers (GeoEngineers et al. 2008:6). Wharves and offshore log rafts were associated with the lumber mill since its construction in 1890 (GeoEngineers et al. 2008:3). Wave and currents have significantly eroded the shoreline since at least 1962. To reduce erosion, the shoreline has been temporarily reinforced.

5.2.3 MJB Upland Area

As with the Port Upland Area located directly to the north, much of the MJB Upland Area is located on former shallow tidelands. Multiple layers of historical fill overlie native glacial deposits and marine sediment. Surficial soils consist primarily of recent gravel and sand fill, occasionally mixed with wood debris (GeoEngineers et al. 2008:5). The uppermost fill layer consists of very dark grayish brown gravels with silt and sand (GeoEngineers 2008:27), which reaches depths of at least 2 ft (0.6 m) BGS (GeoEngineers 2008:35). A variety of sand, gravel and silt layers, all mixed with varying types and amounts of wood by-products, lie underneath (GeoEngineers 2008:27). Wood waste and soft soils were removed and replaced with granular fill between 1981 and 1983 (GeoEngineers 2008:5). Standard Penetration Test MW-7 revealed that 4.5 ft of fill overlies a thick layer of mottled, native sediments in the western portion of the MJB Upland Area (GeoEngineers 2008:Appendix A, Log of Well No. MW-7). Geoprobe macro-core sample PP-6 ascertained that patches of soils and wood by-products remain in some parts of the eastern portion of the MJP Upland Area. Fill appeared above 5.0 BGS. Matted wood fibers were found 5.0 to 5.5 ft BGS, and soft silt was found 5.5 to 9.0 ft BGS. Native sediments were found 9.0 ft BGS (GeoEngineers 2008:Appendix U, Log of Boring PP-6).

5.2.4 MJB Marine Area

The MJB Marine Area is located just south of the Port Marine Area on Fidalgo Bay's western shoreline. The northern portion of Fidalgo Bay is relatively deep, greater than 60 ft below MLLW, although the harbor adjacent to the project area is much shallower. The shoreline consists of fill materials including riprap, debris, piling, sheet piling, concrete bulkheads, docks, and piers (GeoEngineers et al. 2008:6). A 16-inch effluent pipeline to Guemes Channel was constructed in 1951 (GeoEngineers 2008:3). Although the shoreline has been temporarily reinforced, the northeast shoreline of the MJB property has experienced continuous erosion during MJB's ownership since 1990, and the erosion rate appears to have increased during the last four years (GeoEngineers et al. 2008:7). The GeoEngineers study reports that: "Adjacent to the MJB North Area, the North Channel was originally dredged in 1975 to a depth of approximately 12 ft below MLLW to support barge transfer operations” (GeoEngineers et al. 2008:6).

5.3 Pedestrian Survey

An HRA archaeologist conducted a pedestrian survey of the upland project area on December 10, 2008. He walked survey transects at 30m intervals across the APE and along its perimeter (Figure 8). The survey was conducted to confirm the suspected infeasibility of digging subsurface shovel probes to observe the level of disturbance at the site, and to judge the likelihood that historic properties might be present.

No archaeological deposits or undisturbed features were encountered during the survey. The APE has been disturbed or covered by fill generated by the industrial processes of the lumber and other mills and shoreline wood-product processing facilities. Industrial deposits often accumulate as a by-product of the manufacturing processes employed. Most of the sediments observed on the surface consist of angular basalt fragments, which have been sorted according by size. These types of "road ballast" gravels are common in the Northwest and have typically been used to provide foundations and control erosion. Along the project area's shoreline, erosion has exposed a cross-section of the fill (Figure 9), which was observed to contain bits of brick, mortar, concrete, and ferrous materials. It is typical for historic fill to contain remnant architectural materials from previously demolished buildings and structures. The presence of the fragmentary historic materials in the fill indicates that intact prehistoric deposits are not present.

During the plant's operation, mill improvements and retrofitting frequently disturbed the site's deposits. More recently, several modern structures, high-capacity water lines, sewer lines, and parking lots have been installed within the APE, further disturbing the fill and any historical materials that might be contained in it.

The archaeologist observed no buildings or structures, 50 years or older, in or close to the APE.

6.0 Potential for Historic Properties and Recommendations

Historic properties consist of cultural resources that are eligible for listing in the National Register of Historic Places. These resources can be prehistoric and historic-period archaeological sites, buildings and structures, and traditional cultural properties. The latter are places, which may not show human modification, that are important to the traditional culture of communities such as Indian tribes. National Register listing requires that the resource be at least 50 years old (younger resources may qualify if their enduring significance can be demonstrated), retain integrity, and meet one of four criteria of association with important past events, figures, design or production, and containing information important in prehistory or history.

As discussed in Section 5.0 above, HRA's research about the project area revealed no close buildings or structures, no indications of shipwrecks, and no evidence for ethnohistoric or other tribal sites.

Figure 8. Pedestrian survey transects.

Figure 9. View of project area’s eastern shoreline showing historical fill.

6.1 Potential for Archaeological Remains

HRA's research suggests that ongoing historical modifications and demolition of the mill buildings and structures would have resulted in some historic-period archaeological deposits within the fill layers of milling by-products, such as wood fragments, sawdust, and wood pulp, along with materials, such as crushed rock, imported to support the industrial development of the coastline. Many of the historical materials relating to industrial activities of the mill would likely be highly disturbed and out of their original context. The numerous retrofitting and modernization projects of the 1950s, 60s, and 70s have likely disturbed the fill. Geotechnical borings in the project area show that the fill contains wood debris and miscellaneous shoreline deposits. Pilings and portions of the wharf structures also could be present. A former effluent pipeline, if in place, could date to 1951. Artifacts and features associated with industrial processes in the project area are unlikely to be eligible for listing in the National Register of Historic Places. Considerable documentation records the mill complex and the activities and processes, which were typical of the region.

Archaeological remains dating to the prehistoric, ethnohistoric, and very early historic-period use of the project area might be preserved beneath fill in the upland area. The bit of original shoreline that likely remains buried under the east side of Q Ave. has the potential to contain intact historical deposits. Sanborn maps dating to 1897 and 1903 show a few small “cheap” buildings including a bunk house and a boarding house/mess house. If present, archaeological remains associated with early workers, who might have included Native Americans or Asian Americans, could supplement scarce documentary information on working conditions.

Past dredging in the marine areas means that intact prehistoric or historic-period archaeological deposits would not be expected there.

Because the project area west of Q Avenue consisted historically of shallow tidelands, such use most likely would have resulted from Native Americans discarding debris from shoreline occupation into adjacent waters or construction and use of a feature such as a fish trap. Early historical maps discussed in Section 5.1 above indicate the placement of refuse on the north side of the mill complex.

Prehistoric, ethnohistoric, and early historic-period archaeological deposits would most likely occur directly above or within the top portion of native glacial deposits or marine sediments, between about 7 to 10 ft (2-3 m) BGS in the western part of the project area upland and about 15 ft (4.6 m) BGS in the eastern part of the project area upland.

6.2 Recommendations

The following paragraphs provide HRA's recommendations for archaeological work in the project area, based on the potential for planned remedial activities to affect archaeological materials that could be present.

6.2.1 Port Upland Area

As discussed in Section 6.1, prehistoric, ethnohistoric, and early historic-period archaeological remains associated with shallow water activities could be present in the Port Upland Area. Such materials would occur beneath this historical fill about 7 – 10 ft (2-3 m) BGS west of R Avenue and about 15 ft (4.6 m) BGS east of R Avenue. Remedial excavations, shown in Figure 3a, include some areas potentially reaching 6 ft (1.8 m) west of R Avenue and some places reaching up to 12 to 15 ft (4.6 m) BGS east of R Avenue. HRA recommends that the Port provide for archaeological monitoring of excavations below 5 ft (1.5 m) BGS west of R Avenue and below 13 ft (4 m) east of R Avenue (Figure 10). Archaeological monitoring would thus begin just above the anticipated depth of fill so that any excavations into native sediments would observe archaeological materials that might be present on top or in the upper portion of these sediments. The Port also should prepare an archaeological monitoring plan with procedures for treating the discovery of archaeological or human remains.

6.2.2 MJB Upland Area

As discussed in Section 6.1, prehistoric, ethnohistoric, and early historic-period archaeological remains associated with shallow water activities could be present in the MJB Upland Area. Such materials would occur beneath this historical fill about 4.5 ft (1.4 m) BGS in the western portion and about 5.5 ft (1.7 m) BGS in the eastern portion of the MJB Upland Area. Remedial excavations, shown in Figure 3b, include some areas potentially reaching 6 ft (1.8 m). HRA recommends that the Port provide for archaeological monitoring of excavations below 3 ft (0.9 m) in all areas of the MJB Upland Area (Figure 11). Archaeological monitoring would thus begin just above the anticipated depth of fill so that any excavations into native sediments would observe archaeological materials that might be present on top or in the upper portion of these

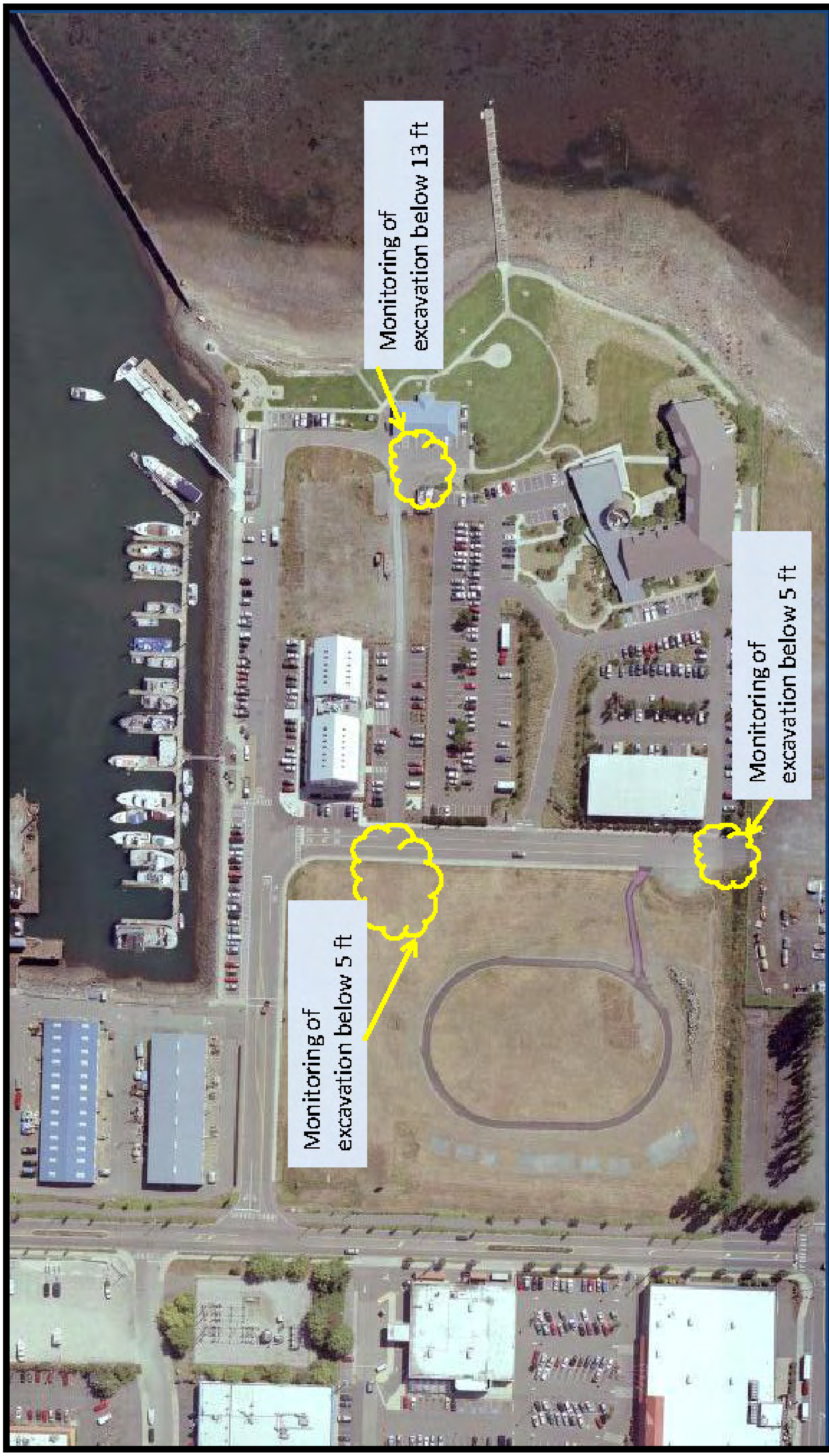

Figure 10. Archaeological monitoring areas in the Port upland.

Figure 11. Archaeological monitoring in the MJB upland.

sediments. The Port also should prepare an archaeological monitoring plan with procedures for treating the discovery of archaeological or human remains.

6.2.3 Port and MJB Marine Areas

Figure 4 shows marine portions of the project area where dredging and capping is planned. Remediation activities also will include the construction of two wave attenuation structures similar to breakwaters to protect the sediment cap from wave action. HRA recommends no archaeological work for the marine areas because past dredging in these areas would have removed any intact archaeological materials.

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Appendix A

Letters to Tribes

A WASHINGTON PUBLIC PORT
OWNED BY THE RESIDENTS
OF THE LOCAL COMMUNITY

FIRST AND COMMERCIAL AVENUE • P.O. BOX 297 • ANACORTES, WA 98221 USA
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December 1, 2008

Ms. Diana Barg
Cultural Resources Program Manager
Samish Indian Nation
P.O. Box 217
Anacortes, WA 98221

Re: *REQUEST FOR INFORMAL CULTURAL RESOURCES CONSULTATION ON CLEANUP OF THE FORMER SCOTT PAPER CO. MILL SITE*

Dear Ms. Barg:

The Port of Anacortes is under an Agreed Order with the Washington State Department of Ecology to clean up contaminated soil, sediment, and wood waste in the Seafarers' Memorial Park area. This is the former location of the Scott Paper Company lumber mill. Attached are figures showing the limits of the project area, the upland areas to be excavated, and the marine areas to be dredged and capped. Two wave attenuation structures similar to breakwaters are proposed to protect the sediment cap in the marine area from wave action. The existing timber breakwater at the tip of Seafarers' Memorial Park would be removed. These features are in the preliminary design phase and the Port and MJB are working with the Department of Ecology to finalize the clean-up remedy.

The project area is accessed via Seafarers' Way, just east of Q Avenue and south of the Cap Sante Boat Haven in Anacortes. We have hired Historical Research Associates to prepare a Cultural Resources Assessment of the site prior to submittal of permit applications to the regulatory agencies. We will provide a copy of the report to you once it is final. After we submit formal permit applications in early 2009, the Corps of Engineers will initiate the formal consultation process with you as usual.

We believe that the historic shoreline in the area is roughly equivalent to the old BNSF railroad line (currently the Tommy Thompson trail), and that the project area consists of fill placed throughout the 20th century. However, we recognize the possibility that cultural resources could be discovered during excavation activities. The Samish Indian Nation may have information and concerns about the natural resources, cultural resources, and traditional use of the area. It is of upmost importance to the Port of Anacortes that we learn about your concerns and also provide useful information to you about the scope of the project.

Our goal is to communicate with you about the project from start to finish and ensure that work is conducted in a manner sensitive to tribal concerns. We would like to meet with you at our project office near the site on one of two upcoming days – December 16th or January 8th. Please let me know which date is convenient for you and whether morning or afternoon is preferred. We have also invited Larry Campbell, Tribal Historic Preservation Officer for the Swinomish Indian Tribal Community. I can be reached at 360.299.1818 or you can e-mail me at: connie@portofanacortes.com.

Sincerely,

PORT OF ANACORTES

Connie Thoman

Connie Thoman
Environmental Administrator

Cc: Christine Woodward, Director - Dept. of Natural Resources, Samish Indian Nation
Bob Hyde, Executive Director, Port of Anacortes
Bob Elsner, Director of Engineering, Port of Anacortes

PORT OF ANACORTES
Est. 1926
A WASHINGTON PUBLIC PORT OWNED BY THE RESIDENTS OF THE LOCAL COMMUNITY
FIRST AND COMMERCIAL AVENUE • P.O. BOX 297 • ANACORTES, WA 98221 USA
(360) 293-3134 • FAX (360) 293-9608 • WWW.PORTOFANACORTES.COM

December 1, 2008

Mr. Larry Campbell
Tribal Historic Preservation Officer
Swinomish Indian Tribal Community
P.O. Box 817
La Conner, WA 98257

Re: *REQUEST FOR INFORMAL CULTURAL RESOURCES CONSULTATION ON CLEANUP OF THE FORMER SCOTT PAPER CO. MILL SITE*

Dear Mr. Campbell:

The Port of Anacortes is under an Agreed Order with the Washington State Department of Ecology to clean up contaminated soil, sediment, and wood waste in the Seafarers' Memorial Park area. This is the former location of the Scott Paper Company lumber mill. Attached are figures showing the limits of the project area, the upland areas to be excavated, and the marine areas to be dredged and capped. Two wave attenuation structures similar to breakwaters are proposed to protect the sediment cap in the marine area from wave action. The existing timber breakwater at the tip of Seafarers' Memorial Park would be removed. These features are in the preliminary design phase and the Port and MJB are working with the Department of Ecology to finalize the clean-up remedy.

The project area is accessed via Seafarers' Way, just east of Q Avenue and south of the Cap Sante Boat Haven in Anacortes. We have hired Historical Research Associates to prepare a Cultural Resources Assessment of the site prior to submittal of permit applications to the regulatory agencies. We will provide a copy of the report to you once it is final. After we submit formal permit applications in early 2009, the Corps of Engineers will initiate the formal consultation process with you as usual.

We believe that the historic shoreline in the area is roughly equivalent to the old BNSF railroad line (currently the Tommy Thompson trail), and that the project area consists of fill placed throughout the 20th century. However, we recognize the possibility that cultural resources could be discovered during excavation activities. The Swinomish Indian Tribal Community may have information and concerns about the natural resources, cultural resources, and traditional use of the area. It is of upmost importance to the Port of Anacortes that we learn about your concerns and also provide useful information to you about the scope of the project.

Our goal is to communicate with you about the project from start to finish and ensure that work is conducted in a manner sensitive to tribal concerns. We would like to meet with you at our project office near the site on one of two upcoming days – December 16th or January 8th. Please let me know which date is convenient for you and whether morning or afternoon is preferred. We have also invited Diana Barg, Cultural Resources Program Manager for the Samish Indian Nation. I can be reached at 360.299.1818 or you can e-mail me at: connie@portofanacortes.com.

Sincerely,

PORT OF ANACORTES

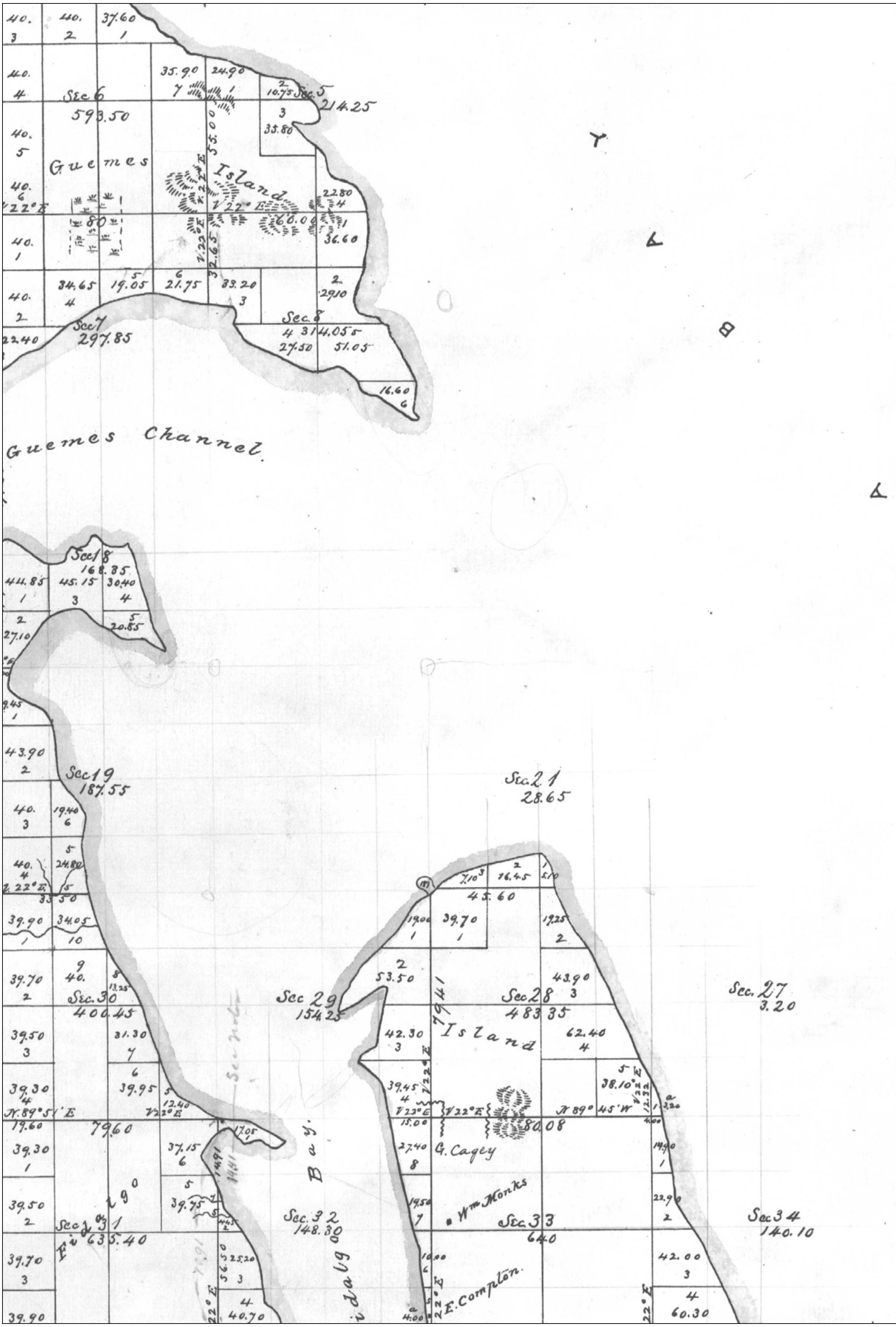
Connie Thoman

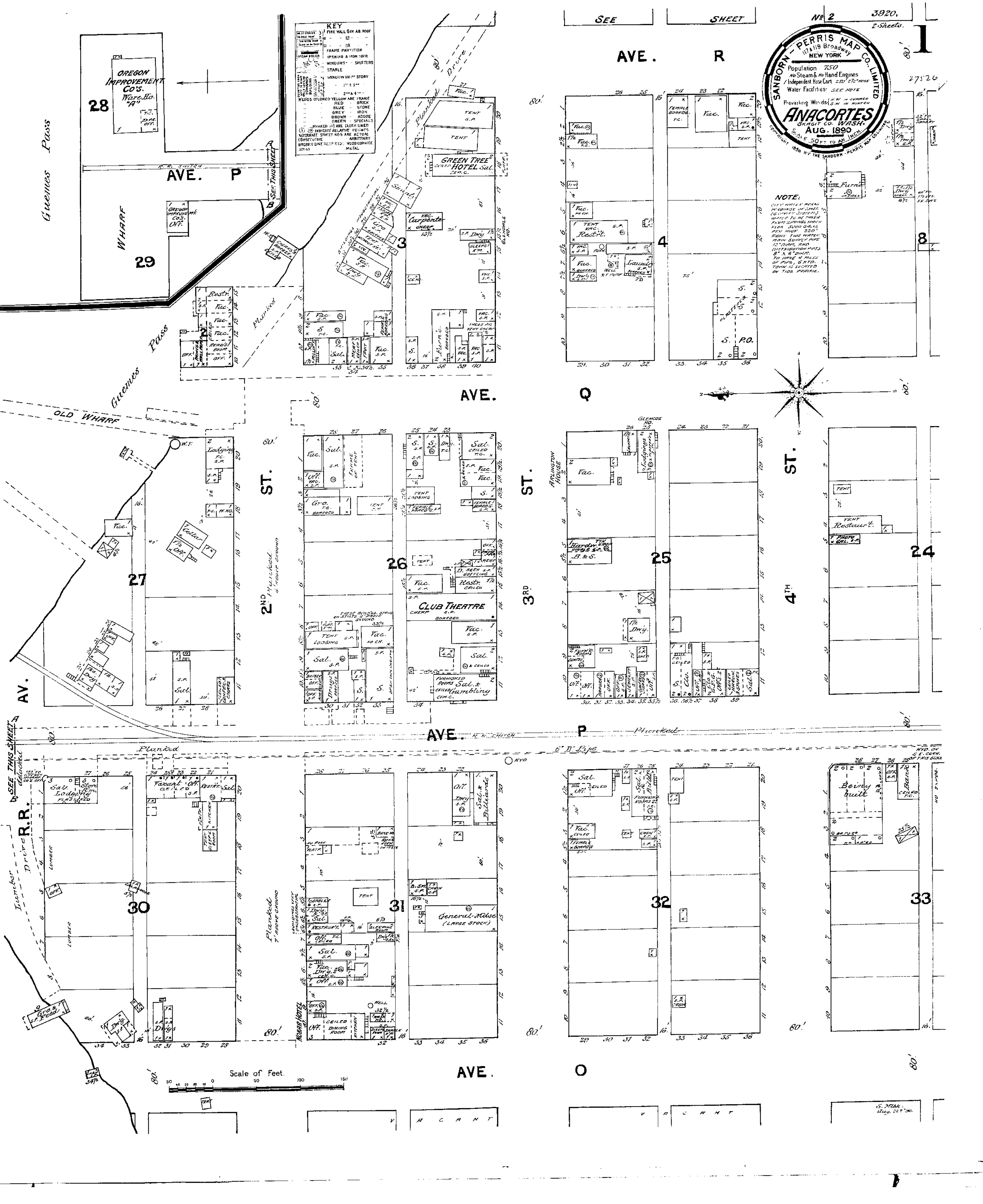
Connie Thoman
Environmental Administrator

Cc: Charlie O'Hara, Swinomish Indian Tribal Community
Bob Hyde, Executive Director, Port of Anacortes
Bob Elsner, Director of Engineering, Port of Anacortes

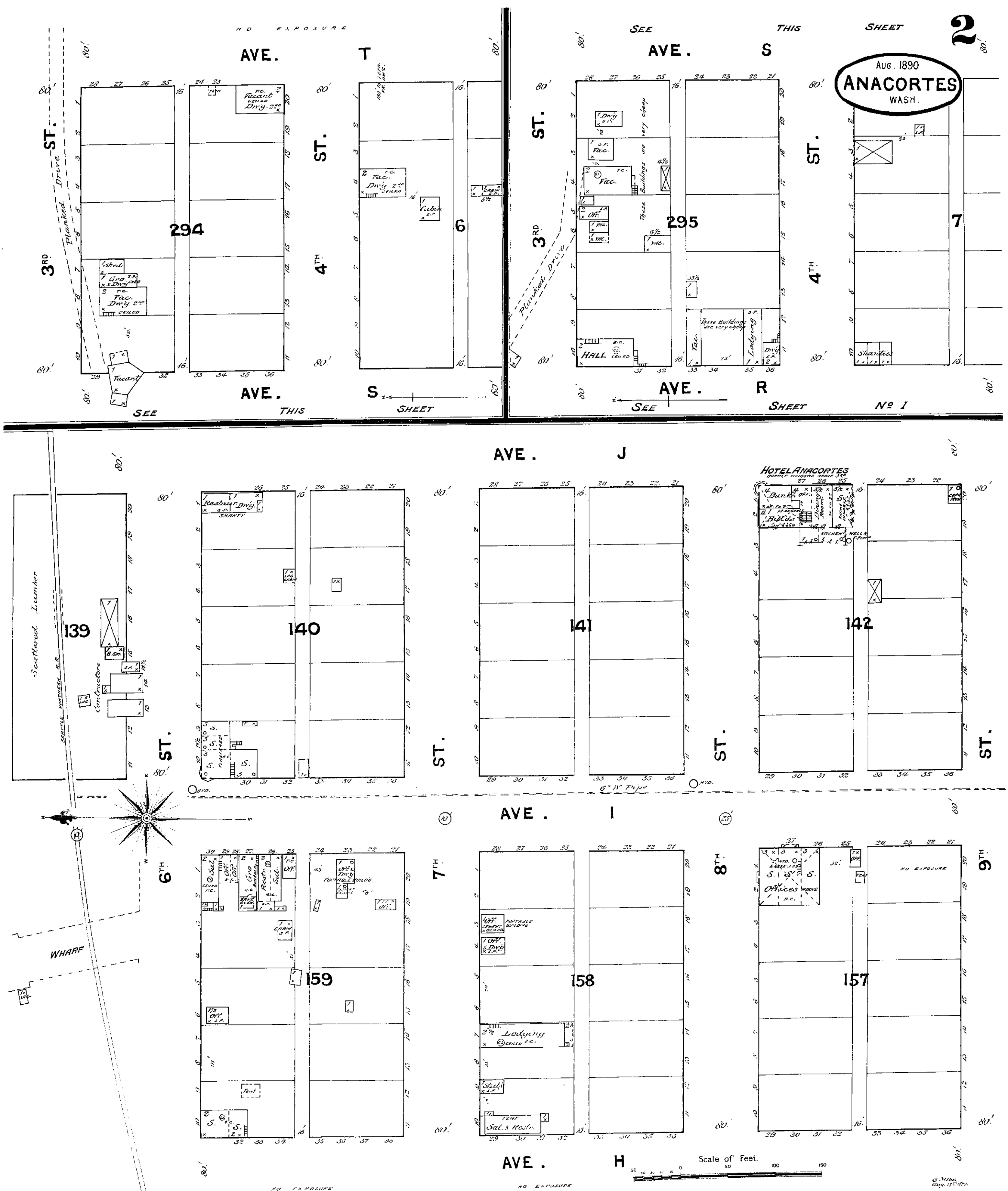
Appendix B

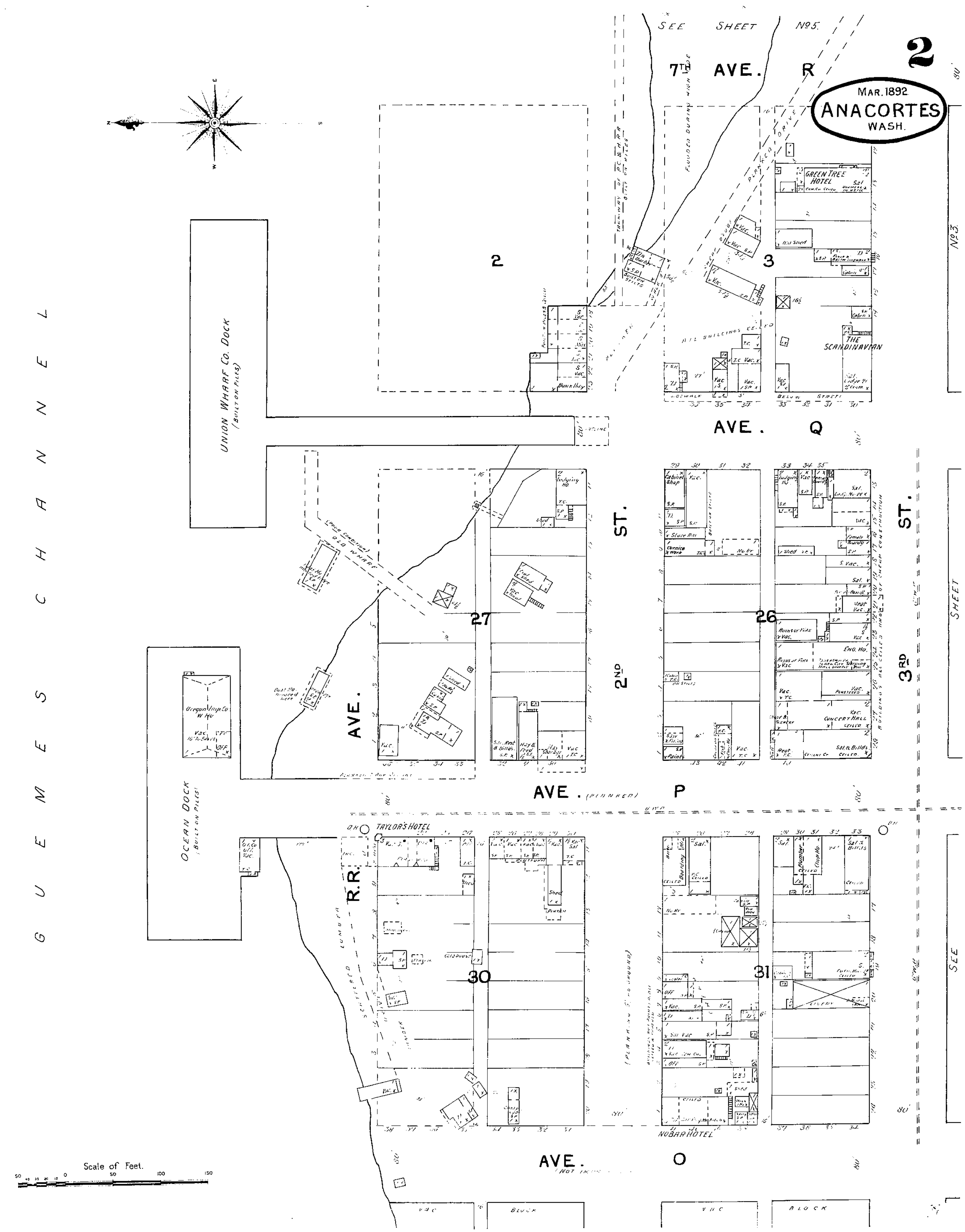
Historical Maps


Sec 6
593.50
Guemes Island
Sec 5
214.25
Sec 7
297.85
Sec 8
Guemes Channel
Y
A
B
A
Sec 18
168.85
Sec 19
187.55
Sec 21
28.65
Sec 29
154.25
Sec 28
483 35
Island
Sec. 27
3.20
Sec. 30
400.45
Bay
G. Cagey
Wm Monks
Sec. 32
148.30
Sec. 33
640
Sec 34
140.10
Sec 31
635.40
E. Compton

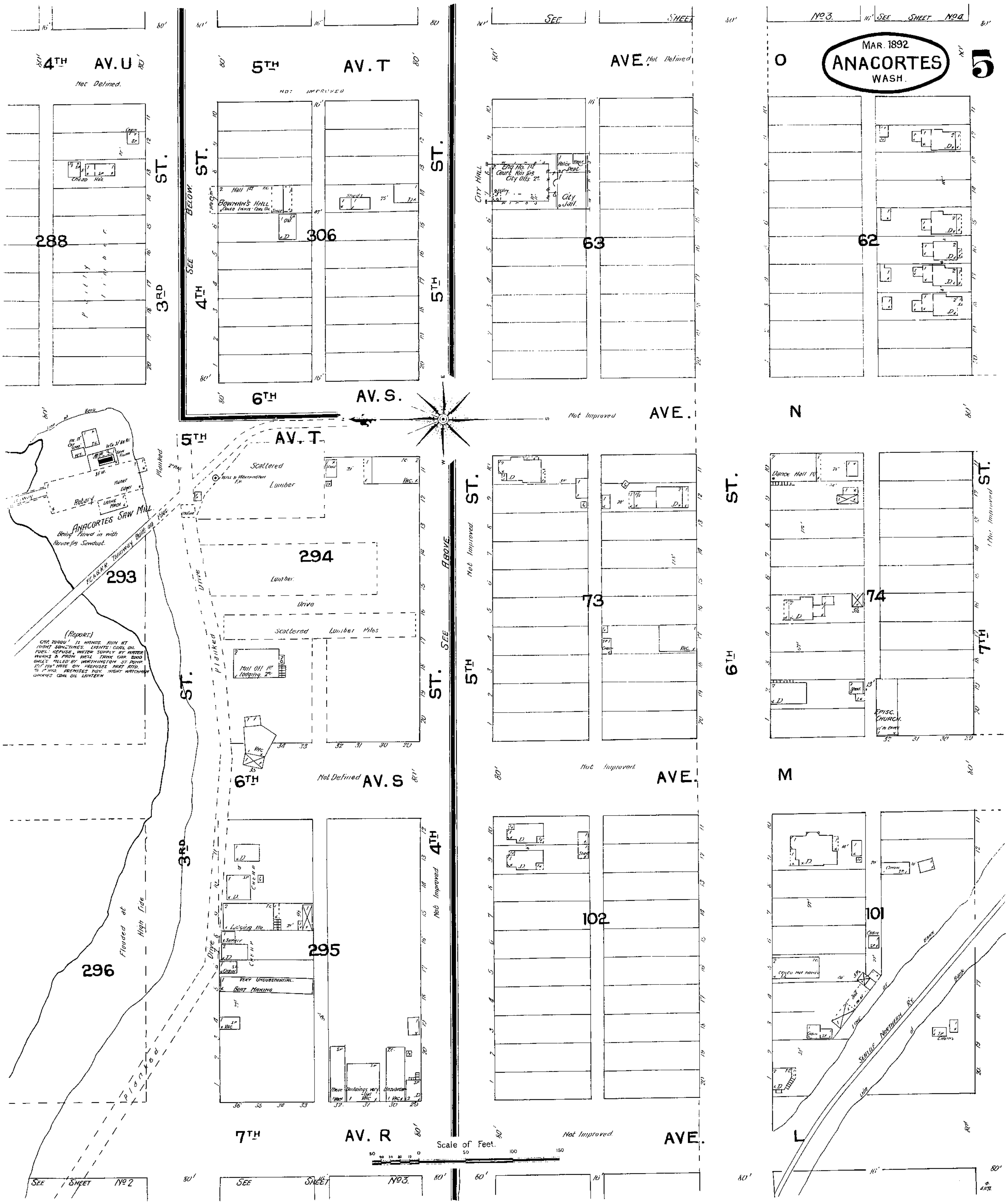


SEE SHEET
№ 2
3920.
2 Sheets.
1
SANBORN-PERRIS MAP CO. LIMITED
117 & 119 Broadway
NEW YORK
Population 750
No Steam & No Hand Engines
1 Independent Hose Cart 250 ft 2½" Hose
Water Facilities SEE NOTE
Prevailing Winds
ANACORTES
SKAGIT CO. WASH.
AUG. 1890
SCALE 50 FT. TO AN INCH.
COPYRIGHT 1890 BY THE SANBORN-PERRIS MAP CO. LIMITED
KEY
AVE. R
AVE. P
AVE. Q
AVE. O
2ND ST.
3RD ST.
4TH ST.
Guemes Pass
OREGON IMPROVEMENT CO'S. Ware Ho. "A"
OREGON IMPROVEMENT CO'S. OFF.
WHARF
OLD WHARF
Planked Drive
GREEN TREE HOTEL
CLUB THEATRE
ARLINGTON HOUSE
GLENCOE HO.
NOBAR HOTEL
General Mdse (LARGE STOCK)
Sal. & Gambling
Being built
Bank
S. P.O.
R.R.
Lumber Drive
NOTE:
Scale of Feet
28
29
3
4
8
27
26
25
24
30
31
32
33
V A C A N T


2
Aug. 1890
ANACORTES
WASH.
NO EXPOSURE
AVE. T
AVE. S
SEE THIS SHEET
AVE. R
SEE SHEET No 1
3RD ST.
4TH ST.
Planked Drive
294
6
295
7
Vacant
Tac.
Dwg.
Shed
Gro.
Cabin
Off.
Hall
These Buildings are very cheap
Lodging
Shanties
AVE. J
HOTEL ANACORTES
Bunks
Dining Room
Kitchen
Scattered Lumber
Contractors
Seattle Northern R.R.
139
140
141
142
Restaur. Dwg.
Shanty
Log Cabin
6TH ST.
7TH ST.
8TH ST.
9TH ST.
6" W. Pipe
HYD.
AVE. I
WHARF
159
158
157
Sal.
Gro.
Restr.
Portable Bldgs.
Portable Building
Lodging
Tent
Sal. & Restr.
Offices
AVE. H
Scale of Feet.
0 50 100 150
NO EXPOSURE



2
MAR. 1892
ANACORTES
WASH.
SEE SHEET No5.
7TH AVE. R
AVE. Q
AVE. (PLANKED) P
AVE. O
2ND ST.
3RD ST.
R.R. AVE.
GUEMES CHANNEL
UNION WHARF CO. DOCK (BUILT ON PILES)
OCEAN DOCK (BUILT ON PILES)
OLD WHARF
GREEN TREE HOTEL
THE SCANDINAVIAN
CONCERT HALL
ENG. HO.
TAYLOR'S HOTEL
NOBAR HOTEL
Oregon Imp. Co. W. Ho.
SCATTERED LUMBER
SEE SHEET No3.
Scale of Feet.
50 0 50 100 150


MAR. 1892
ANACORTES
WASH.
5
4TH AV. U
Not Defined
5TH AV. T
Not Improved
AVE. Not Defined
O
3RD ST.
SEE BELOW
4TH ST.
5TH ST.
288
306
63
62
Bowman's Hall
City Hall
City Jail
6TH AV. S.
Not Improved
AVE.
N
5TH AV. T
Scattered Lumber
Anacortes Saw Mill
Being Filled in with Refuse from Sawdust
293
294
Lumber
Drive
Scattered Lumber Piles
(Report.)
Planked
SEE ABOVE
5TH ST.
Not Improved
73
74
6TH ST.
7TH ST.
Dance Hall
Episc. Church
Not Improved
6TH AV. S
Not Defined
AVE.
M
3RD
296
Flooded at High Tide
295
Lodging Ho.
Boat Making
4TH
Not Improved
102
101
Seattle Northern Ry.
7TH AV. R
Not Improved
AVE.
L
Scale of Feet.
SEE SHEET No 2
SEE SHEET No 3.
SEE SHEET No 3.
SEE SHEET No 4.

6 SHEETS.
5099

1

SANBORN – PERRIS MAP CO., LIMITED
117 & 119 Broadway
NEW YORK

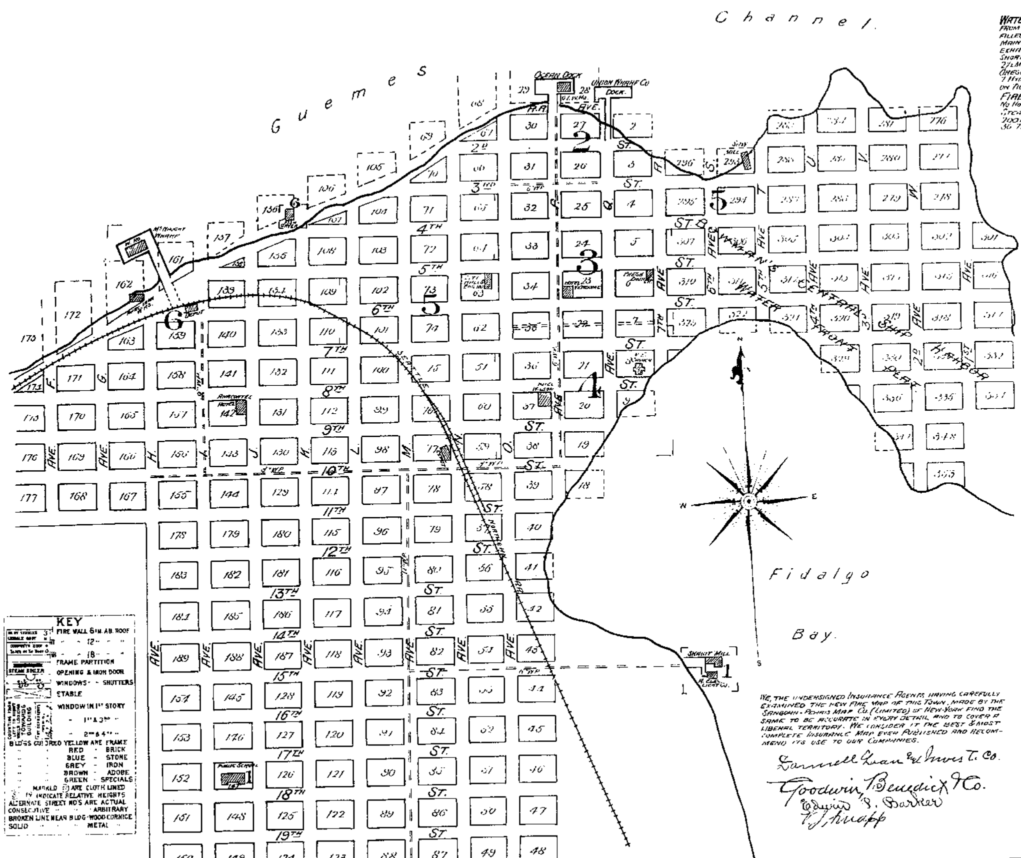
Population 2,600.
1 Steam & No Hand Engines
3 Independent Hose Carts
Water Facilities: SEE NOTE
Prevailing Winds N.W. IN SUMMER, S.W. IN WINTER

ANACORTES.
SKAGIT CO. WASH.
MARCH 1892
SCALE 50 FT. TO AN INCH.

NOTE.

WATER FACILITIES: — Water is carried to City from Reservoir Loc. 220' ab. tide water - which is filled from Springs (Gravity System) — thro. a 12" Main & Dist'd thro 8" & 6" Pipes - Water in Res. exhaustable in summer - this to be improved shortly by connect'g Res. with Heart Lake - 2½ Miles S.E. of City - W. Wks owned by the Oregon Improvement Co. 3⅓ Miles of Mains 7 Hyd's in Town - Press. 90 lbs. - Town is loc. on Tide Prairie - Teleph. in Oper.

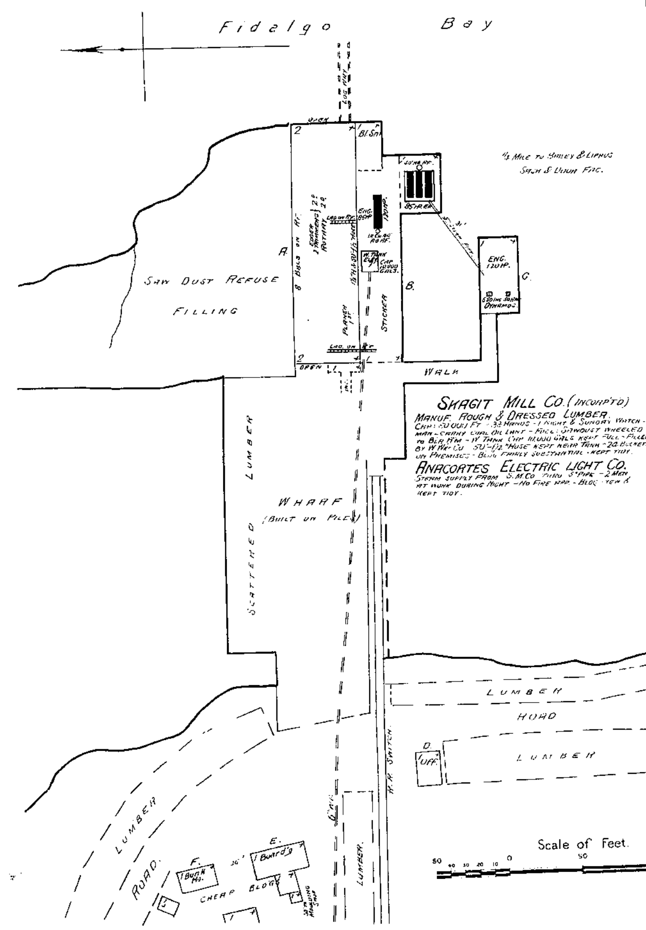
FIRE APP'S: — 5 Volunteer Co's 120 Members No Horses - No Paid Men - 1 3rd Class "Ahrens" Steamer - 1 Chemical Eng. - 3 Hose Carts - 2000' Cotton Hose - 1 Preston H. & L. Truck 36 Tin Buckets - Lights - Elec. & Coal Oil.

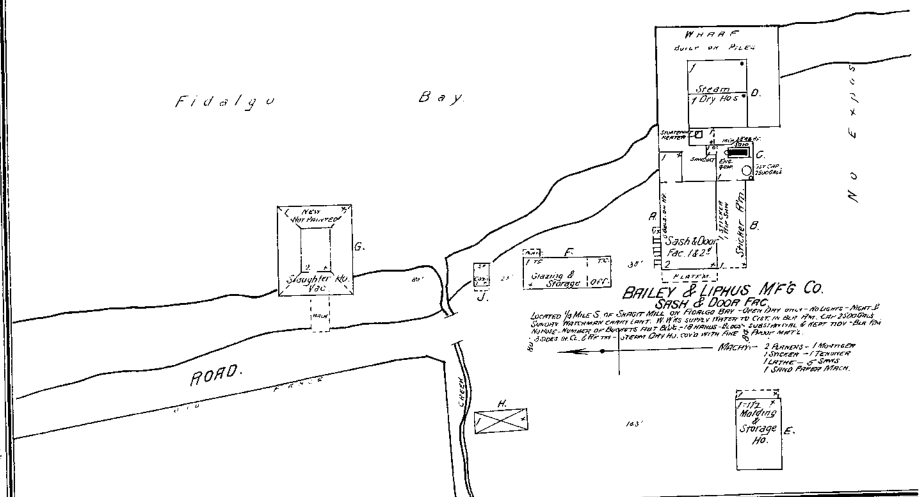


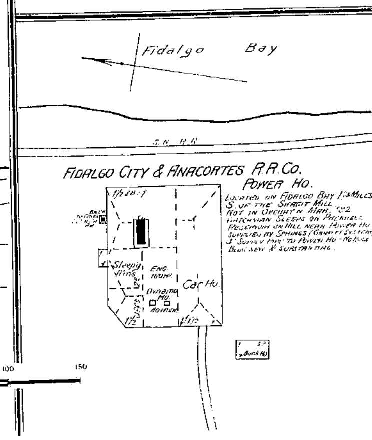
We, the undersigned insurance agents, having carefully examined the new fire map of this town, made by the Sanborn-Perris Map Co (Limited) of New York find the same to be accurate in every detail and to cover a liberal territory. We consider it the best & most complete insurance map ever published and recommend its use to our companies.

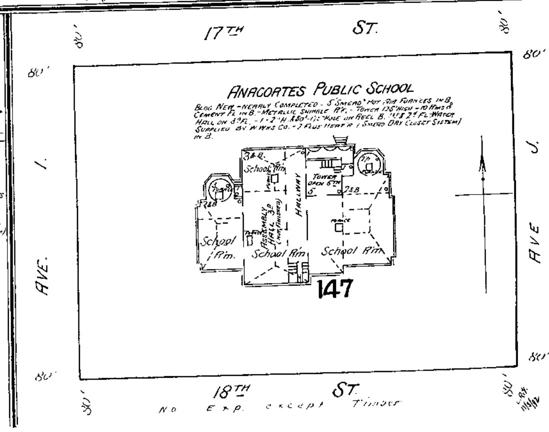
Lowell Lean & Invest. Co.
Goodwin, Benedict & Co.
Edwin S. Barker
P. J. Knapp

INDEX.

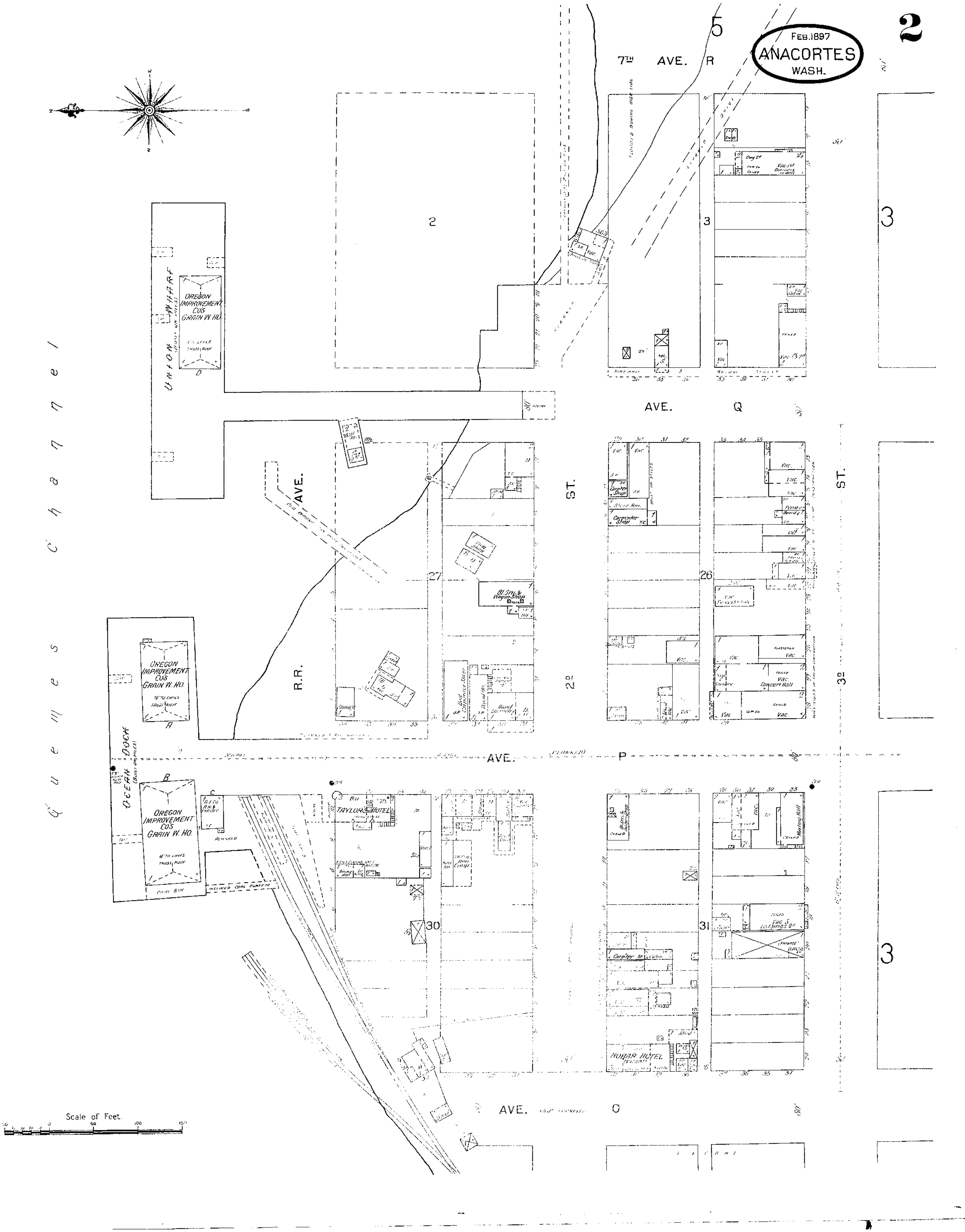


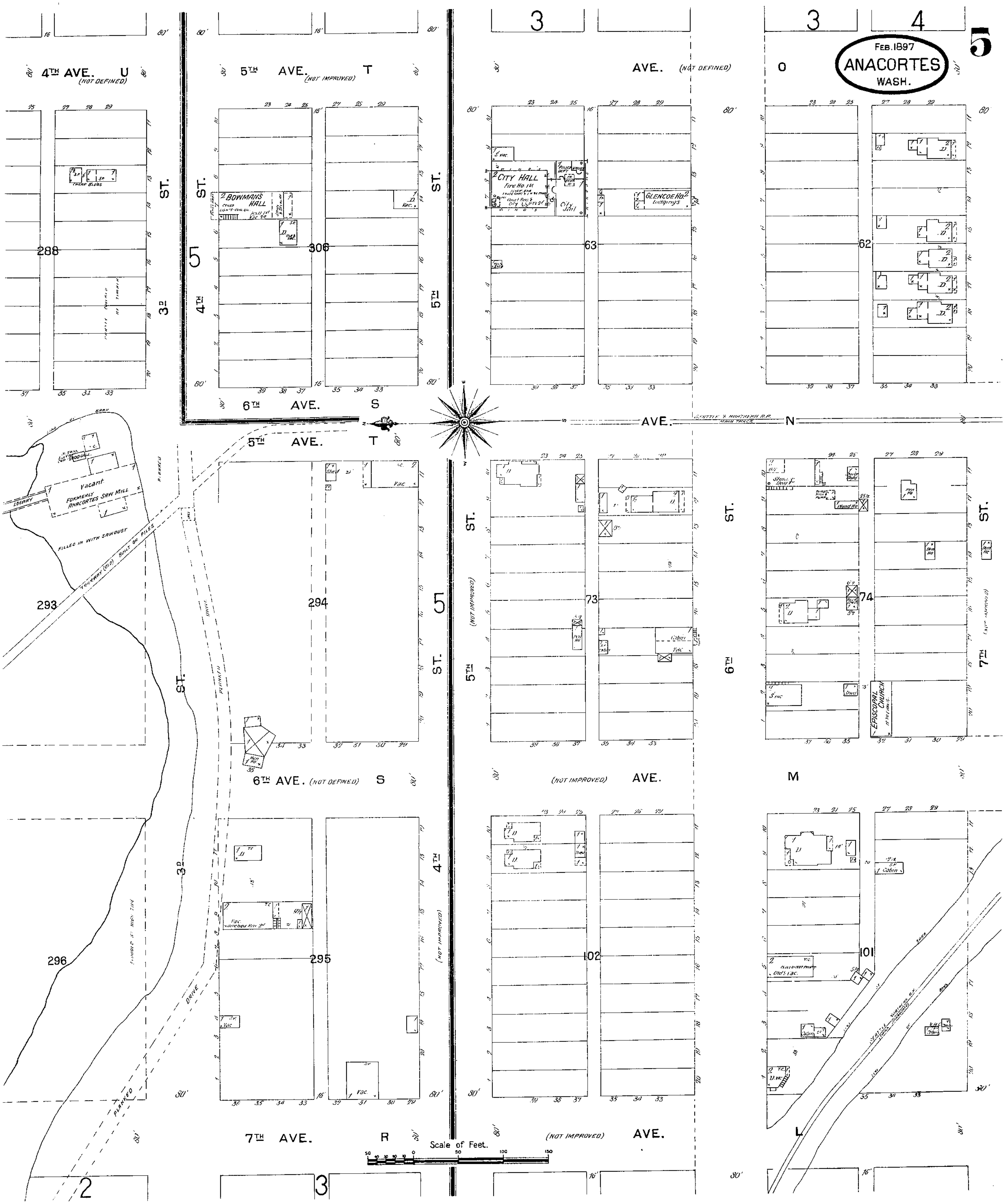




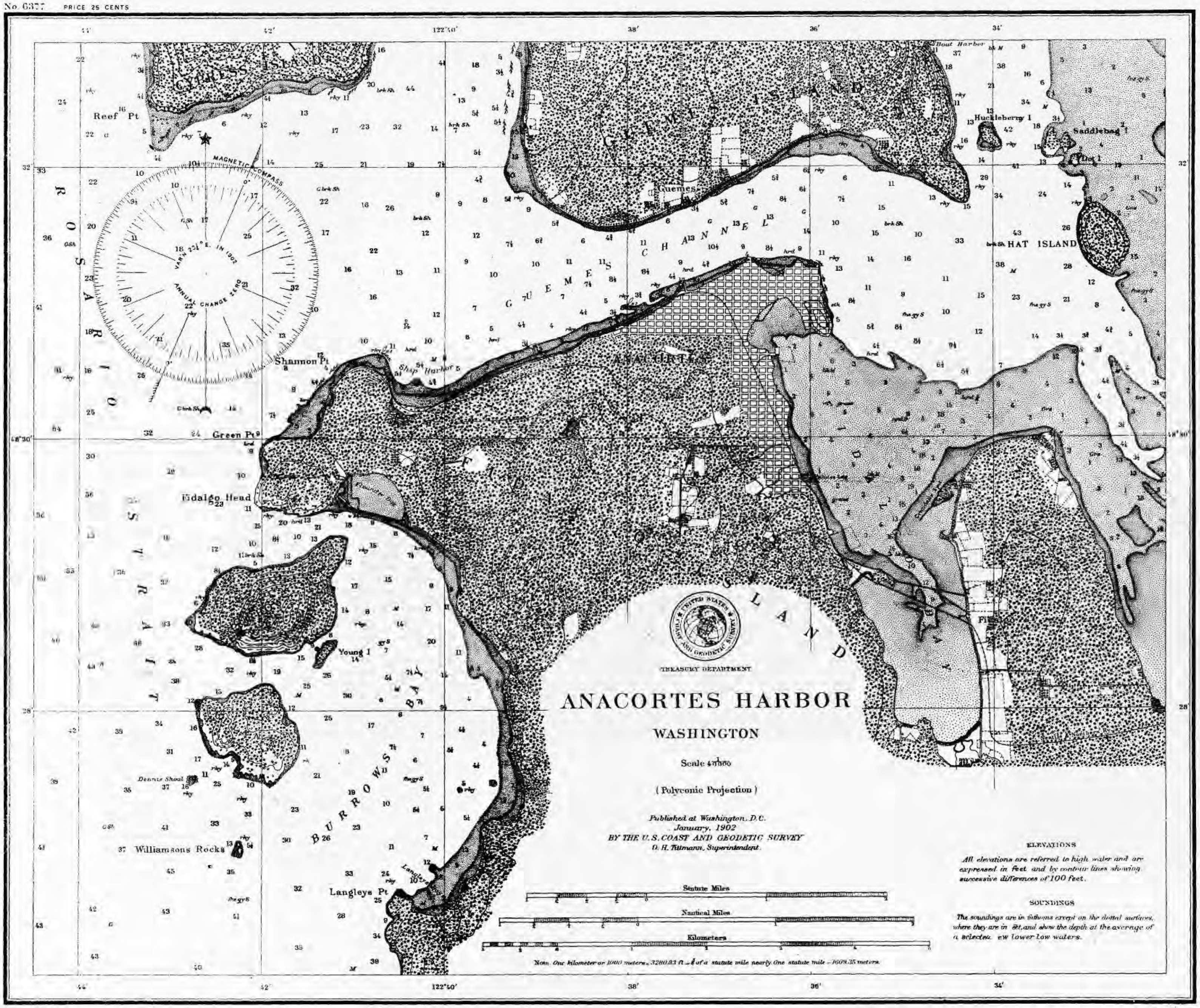


Scale of Feet.

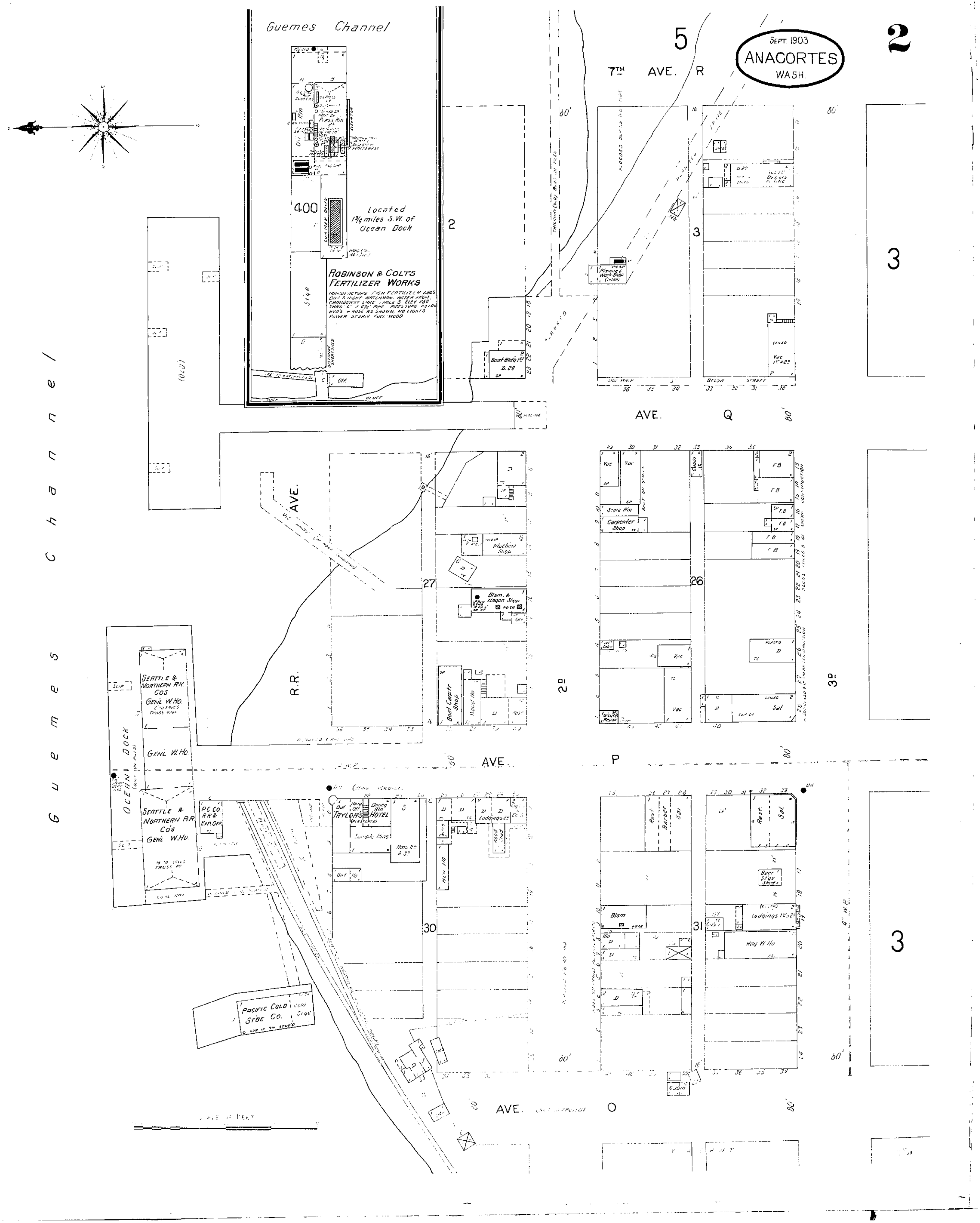

2
FEB. 1897
ANACORTES
WASH.
5
7TH AVE. R
AVE. Q
AVE. P
AVE. O
2ND ST.
3RD ST.
R.R. AVE.
Guemes Channel
UNION WHARF
OREGON IMPROVEMENT CO'S GRAIN W. HO.
OCEAN DOCK
TAYLOR'S HOTEL
NUBAR HOTEL
Concert Hall
Carpenter Shop
Bl. Sm. & Wagon Shop
2
3
27
26
30
31
Scale of Feet.


5
FEB. 1897
ANACORTES
WASH.
4TH AVE. U (NOT DEFINED)
5TH AVE. T (NOT IMPROVED)
AVE. (NOT DEFINED) O
6TH AVE. S
AVE. N
SEATTLE & NORTHERN R.R. MAIN TRACK
5TH AVE. T
6TH AVE. (NOT DEFINED) S
(NOT IMPROVED) AVE. M
7TH AVE. R
(NOT IMPROVED) AVE. L
3D ST.
4TH ST.
5TH ST.
6TH ST.
7TH ST.
(NOT IMPROVED)
CITY HALL
Fire Ho. 1st
City Jail
BOWMANS HALL
GLENCOE HO.
Lodgings
Vacant
FORMERLY ANACORTES SAW MILL
FILLED IN WITH SAWDUST
BUILT ON PILES
EPISCOPAL CHURCH
DRIVE
PLANKED
Cabin
Scale of Feet.
50 0 50 100 150
288
306
63
62
293
294
73
74
296
295
102
101
2
3
4

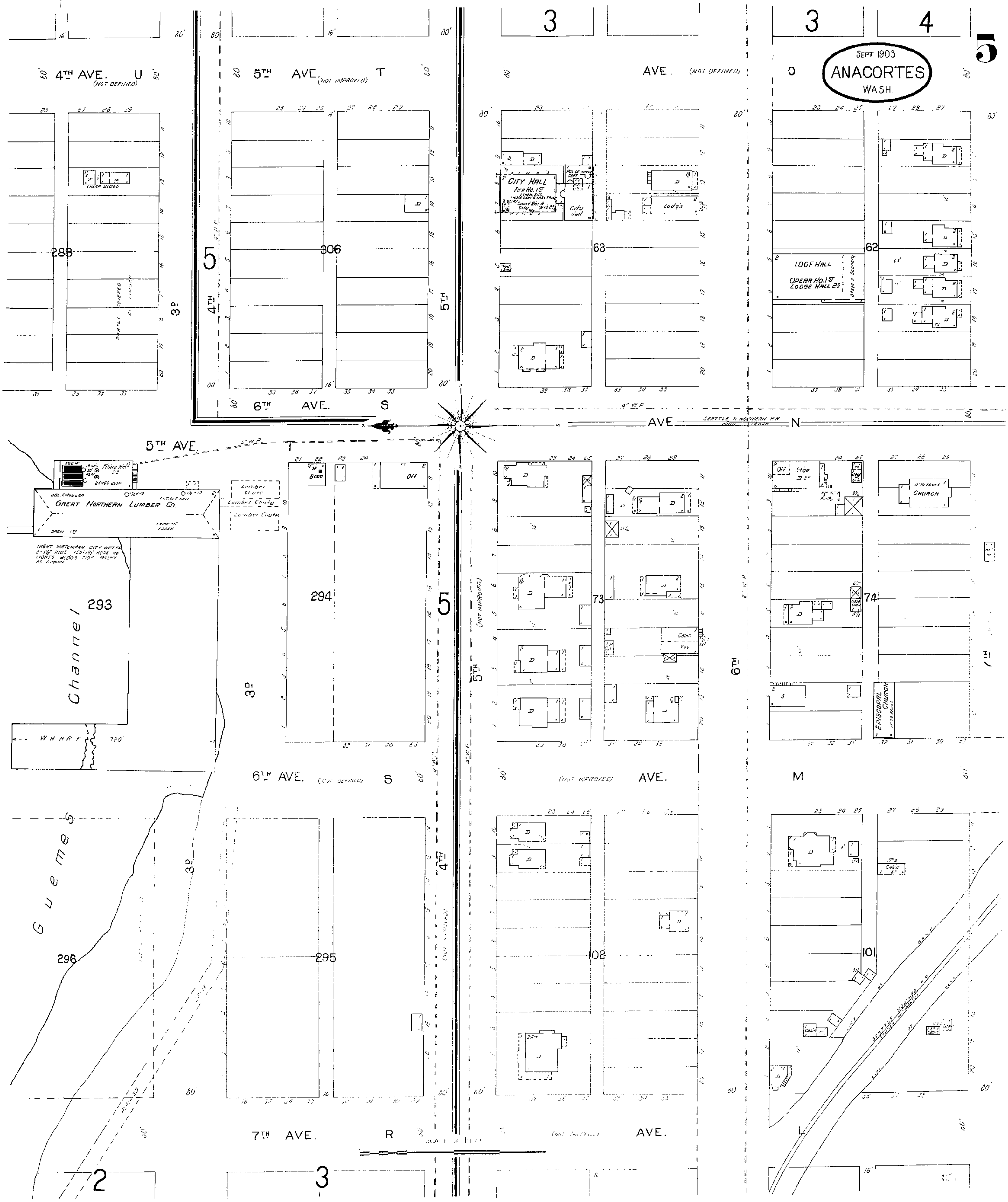
No. 6377 PRICE 25 CENTS



(Anacortes Harbor) U.S.C.&G.S. 6377



SEPT 1903
ANACORTES
WASH.
2
Guemes Channel
400
Located 1 3/4 miles S.W. of Ocean Dock
ROBINSON & COLTS FERTILIZER WORKS
Off.
2
5
7TH AVE. R
60'
3
Planing & Work Shop
Boat Bldg 1st D. 2d
AVE. Q
80'
3
R.R. AVE.
27
Machine Shop
Blsm. & Wagon Shop
Boat Carpntr Shop
Store Rm
Carpenter Shop
Vac
FB
26
Sal
2D
3D
Guemes Channel
SEATTLE & NORTHERN R.R. CO'S GEN'L W.HO.
GEN'L W.HO.
OCEAN DOCK
SEATTLE & NORTHERN R.R. CO'S GEN'L W.HO.
P.C. Co. R.R. & Exp. Off.
AVE. P
80'
TAYLOR'S HOTEL
Dining Rm
Sample Rms
Rms 2d & 3d
Lodgings 2d
Rest
Barber
Sal
Beer Stge Shed
Lodgings 1st & 2d
Hay W. Ho
Blsm
30
31
3
PACIFIC COLD STGE CO.
Cold Stge
60'
Cabin
AVE. O
80'



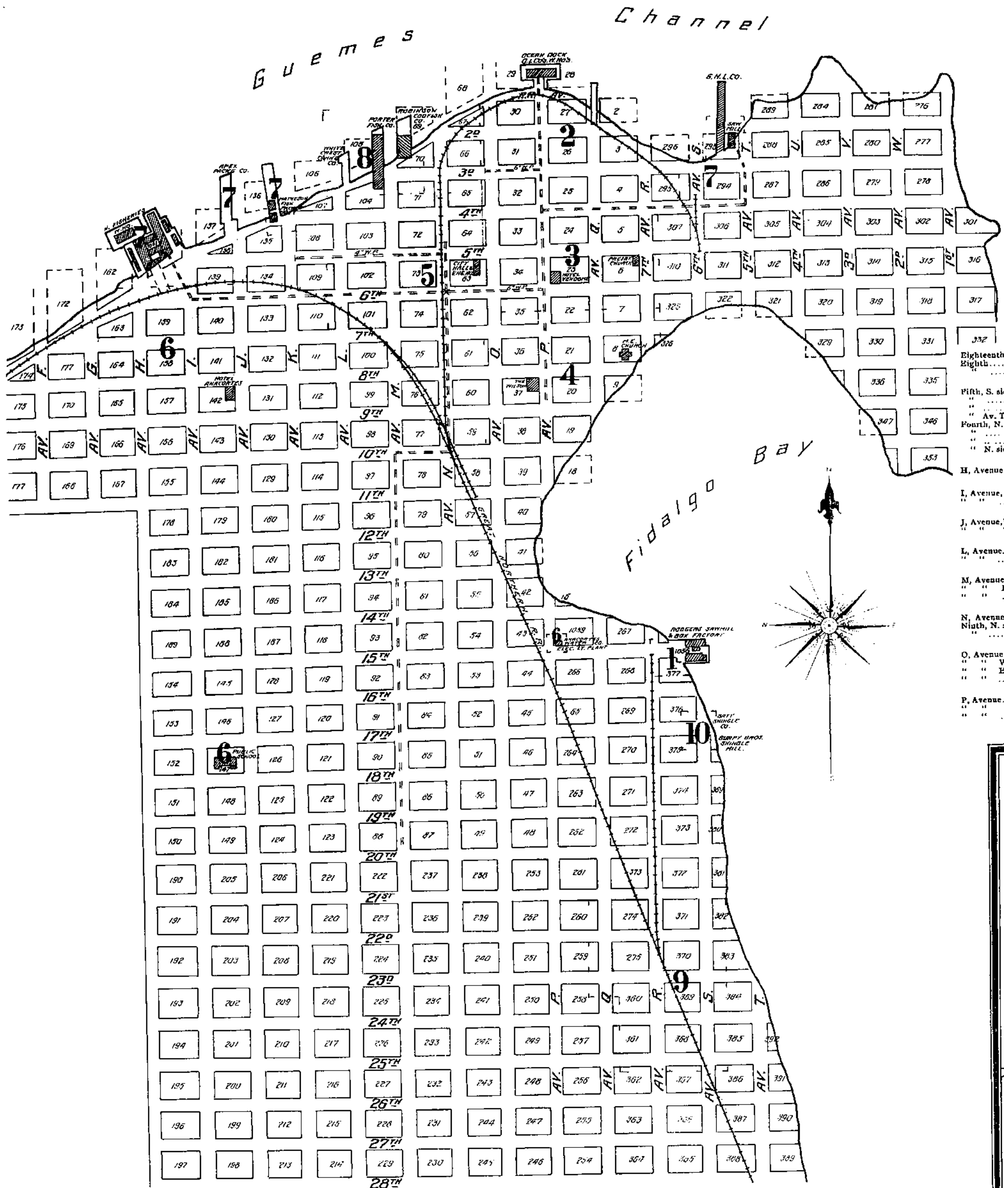
5
SEPT. 1903
ANACORTES
WASH.
4TH AVE. U (NOT DEFINED)
5TH AVE. (NOT IMPROVED) T
AVE. (NOT DEFINED) O
6TH AVE. S
AVE. N
5TH AVE. T
6TH AVE. (NOT DEFINED) S
(NOT IMPROVED) AVE. M
7TH AVE. R
AVE. L
3D
4TH
5TH
6TH
7TH
CITY HALL
Fire Ho. 1ST
Court Rm & City Off's 2D
City Jail
Police Dept.
Lodg's
I.O.O.F. HALL
OPERA HO. 1ST
LODGE HALL 2D
Stage & Scenery
CHURCH
EPISCOPAL CHURCH
Cabin
Vac.
Off.
Stge.
Bksm.
Filing Rm.
GREAT NORTHERN LUMBER CO.
Lumber Chute
WHARF
Channel
Guemes
SEATTLE & NORTHERN R.R.
SCALE OF FEET
288
306
63
62
293
294
73
74
296
295
102
101
2
3
4

10 SHEETS.

1

SANBORN MAP COMPANY
POPULATION 4500
ANACORTES
SKAGIT COUNTY WASH.
OCTOBER 1905
SCALE 50 FT. TO AN INCH
11 BROADWAY, NEW YORK.
COPYRIGHT 1906 BY THE SANBORN MAP COMPANY

PREVAILING WINDS
WATER FACILITIES SEE NOTE.
NO STEAM & NO HAND ENGINE
4 INDEPENDENT HOSE CARTS
1 HOOK & LADDER TRUCK

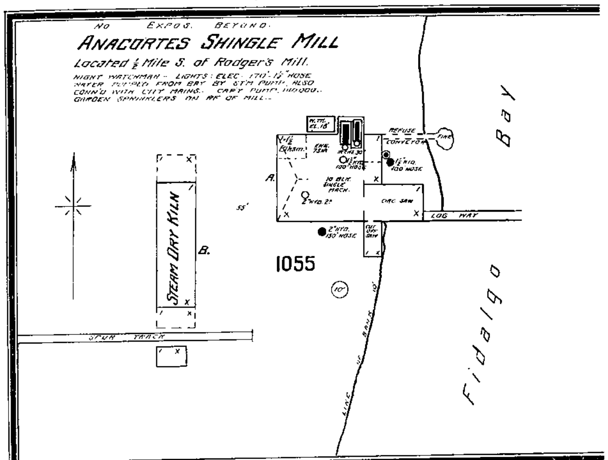


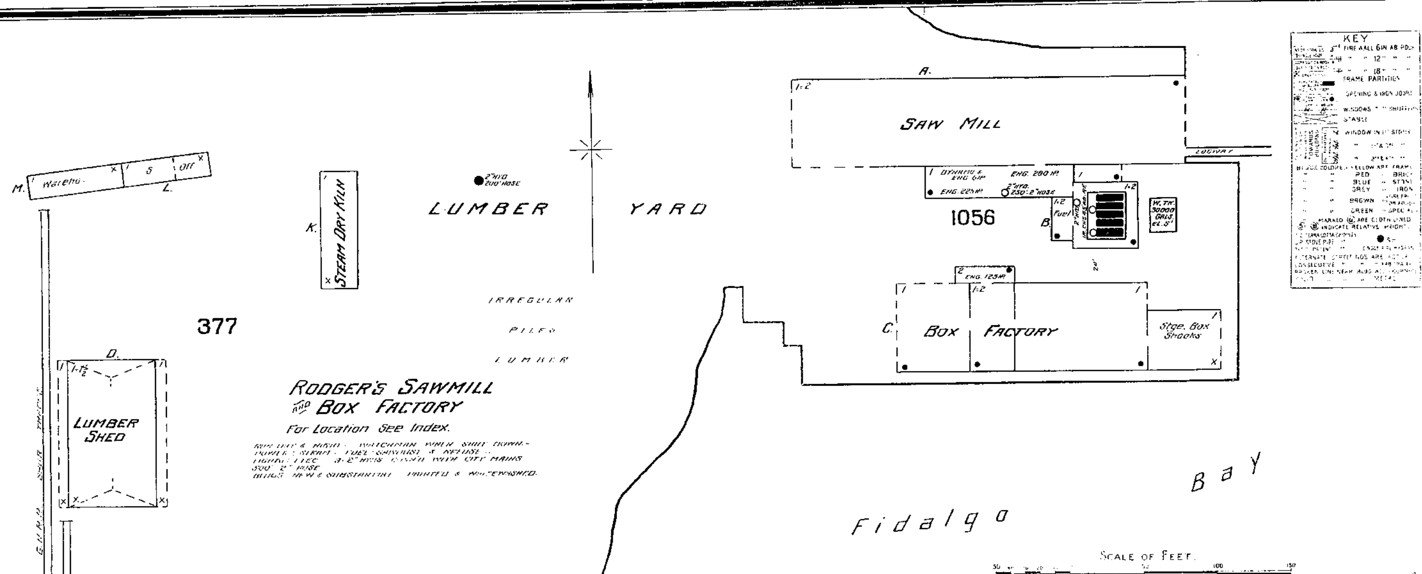
NOTE:

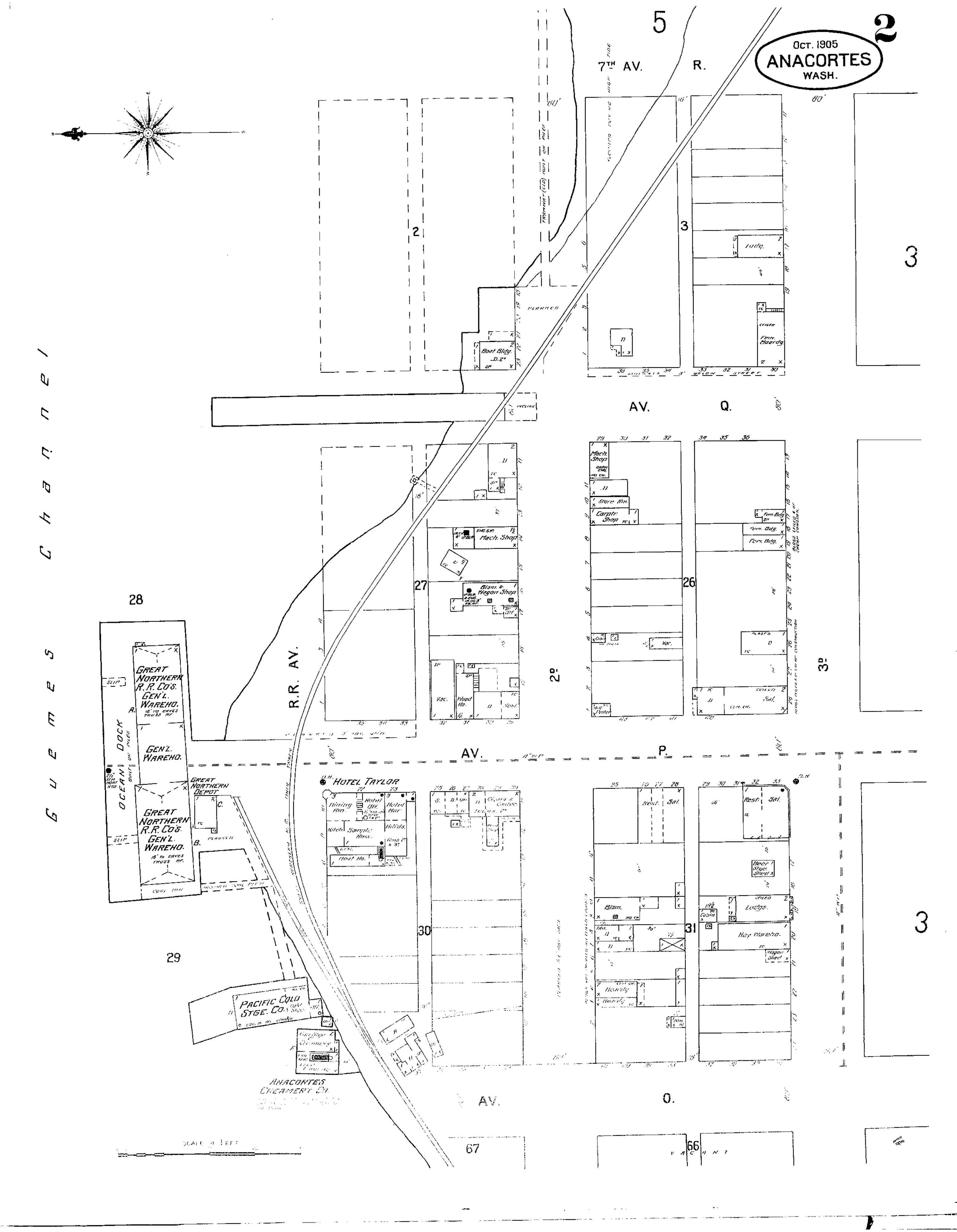
WATER FACILITIES: GRAVITY SYSTEM OWNED BY THE OREGON IMPROVEMENT CO. WATER FROM HEART LAKE LOCATED 2½ MILES S.W. OF HOTEL VENDOME, CONVEYED THROUGH ABOUT 1½ MILES OF 12" WOODEN STAVE PIPE TO A RESERVOIR OF 335,700 GALS. LOCATED ABOUT 1 MILE S.W. OF HOTEL VENDOME AT AN ELEV. OF 220 FT. ABOVE TIDE WATER.- WATER CONVEYED TO TOWN THROUGH 1 MILE OF 12" SPIRAL STEEL PIPE & THENCE THROUGH 6" & 8" DISTRIBUTING MAINS. ABOUT 3½ MILES OF MAINS.- 7 HYDS. PRESSURE ABOUT 80 LBS PER SQ. IN.
FIRE DEPT.: VOLUNTEER. NO HORSES. NO PAID MEN. 1 CHEM. ENG.- 4 HOSE CARTS WITH 500 FT. OF COTTON HOSE EACH & 500 FT. OF 2½" COTTON HOSE IN RESERVE. 1 PRESTON H. & L. TRUCK, 36 TIN BUCKETS.-
NO FIRE LIMITS - GRADE OF TOWN COV'D BY MAP PRACTICALLY LEVEL, EXCEPTING SHEET Nº 6.-

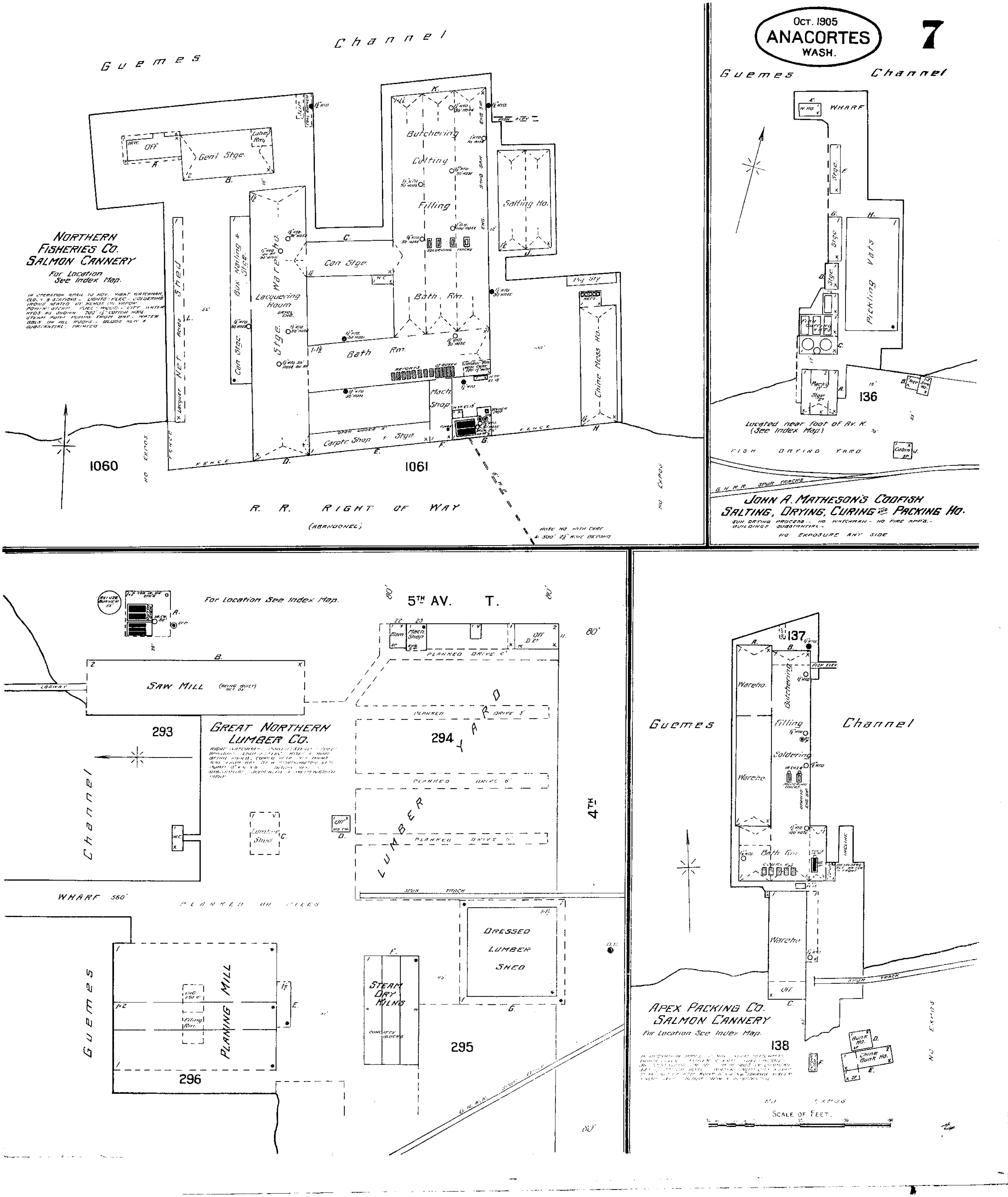
INDEX.

* Indicates only one side of Street shown.





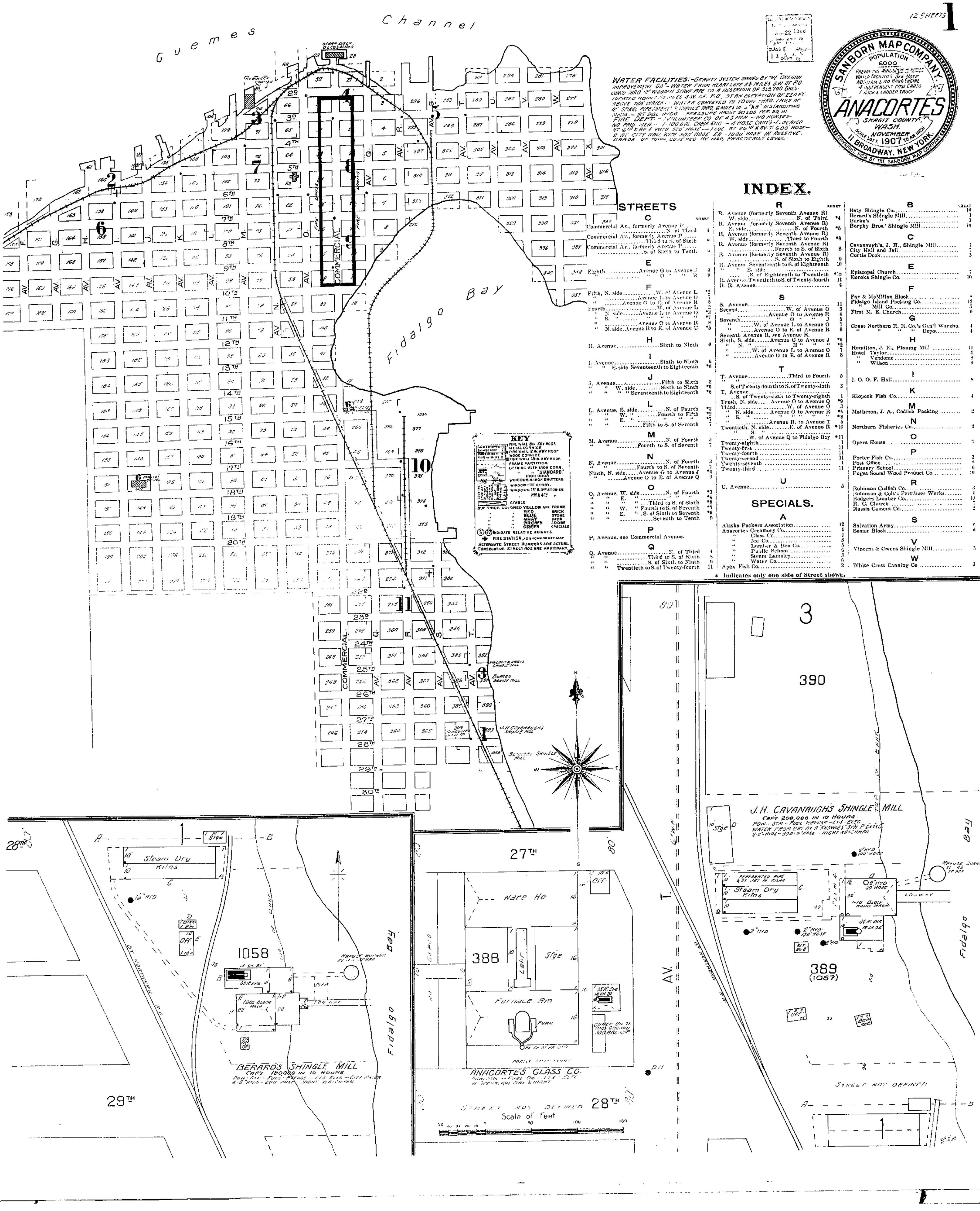

2
Oct. 1905
ANACORTES
WASH.
5
7TH AV.
R.
AV.
Q.
AV.
P.
AV.
O.
R.R. AV.
Guemes Channel
28
29
30
27
26
31
3
67
66
2
3
GREAT NORTHERN R.R. CO'S. GEN'L. WAREHO.
GEN'L. WAREHO.
OCEAN DOCK
GREAT NORTHERN DEPOT
HOTEL TAYLOR
Dining Rm.
Hotel Off.
Hotel Bar
Kitch.
Sample Rms.
Boat Bldg.
Mach. Shop
Store Rm.
Carptr. Shop
Blsm. & Wagon Shop
Wood Ho.
Vac.
Rest.
Sal.
Lodg.
Fem. Boardg.
Fem. Bdg.
Blsm.
Hay Wareho.
Wagon Shed
Beer Stge. Shed
Lodgs.
PACIFIC COLD STGE. CO.
ANACORTES CREAMERY CO.
SCALE OF FEET


Oct. 1905
ANACORTES
WASH.
7
Guemes Channel
NORTHERN FISHERIES CO. SALMON CANNERY
For Location See Index Map.
Off
Gen'l Stge.
Butchering
Cutting
Filling
Salting Ho.
Can Stge.
Wareho.
Lacquering Room
Box Nailing & Stge.
Net Racks Shed
Can Stge.
Bath Rm.
Mach. Shop
Carptr. Shop & Stge.
Chine Mess Ho.
1060
1061
R. R. RIGHT OF WAY
(ABANDONED)
FENCE
NO EXPOS.
JOHN A. MATHESON'S CODFISH SALTING, DRYING, CURING AND PACKING HO.
WHARF
Pickling Vats
Stge.
Packg & Stge.
136
Located near foot of Av. K. (See Index Map.)
FISH DRYING YARD
Cabin
NO EXPOSURE ANY SIDE
For Location See Index Map.
5TH AV.
T.
SAW MILL
293
GREAT NORTHERN LUMBER CO.
294
LUMBER YARD
PLANKED DRIVE
4TH
Channel
WHARF
Guemes
PLANING MILL
296
STEAM DRY KILNS
295
DRESSED LUMBER SHED
Off
Mach. Shop
Lumber Shed
Guemes Channel
137
Wareho.
Butchering
Filling
Soldering
Bath Rm.
Wareho.
APEX PACKING CO. SALMON CANNERY
For Location See Index Map.
138
Bunk Ho.
Chine Bunk Ho.
SCALE OF FEET.

12 SHEETS **1**

SANBORN MAP COMPANY.
POPULATION 6000
ANACORTES
SKAGIT COUNTY, WASH.
NOVEMBER 1907
SCALE 50 FT. TO AN INCH
11 BROADWAY, NEW YORK.

WATER FACILITIES:- GRAVITY SYSTEM OWNED BY THE "OREGON IMPROVEMENT CO." - WATER FROM HEART LAKE 2½ MILES S.W. OF P.O. CONV'D THRO 12" WOODEN STAVE PIPE TO A RESERVOIR OF 335,700 GALS. LOCATED ABOUT 1¼ MILES S.W. OF P.O., AT AN ELEVATION OF 220 FT. ABOVE TIDE WATER. - WATER CONVEYED TO TOWN THRO. 1 MILE OF 12" SPIRAL PIPE (STEEL) & THENCE THRO. 6 MILES OF 4"-"8" DISTRIBUTING MAINS. - 27 DBL. HYDS. - PRESSURE ABOUT 90 LBS PER SQ IN.
FIRE DEPT. - 1 VOLUNTEER CO. OF 45 MEN - NO HORSES - NO PAID MEN - 1 - 100 GAL. CHEM ENG. - 4 HOSE CARTS - 1 LOCATED AT 6TH & AV. I WITH 500' HOSE - 1 LOC. AT 26TH & AV. T 600' HOSE - 2 AT CITY HALL WITH 800' HOSE ER. - 1000' HOSE IN RESERVE.
GRADE OF TOWN, COVERED BY MAP, PRACTICALLY LEVEL.



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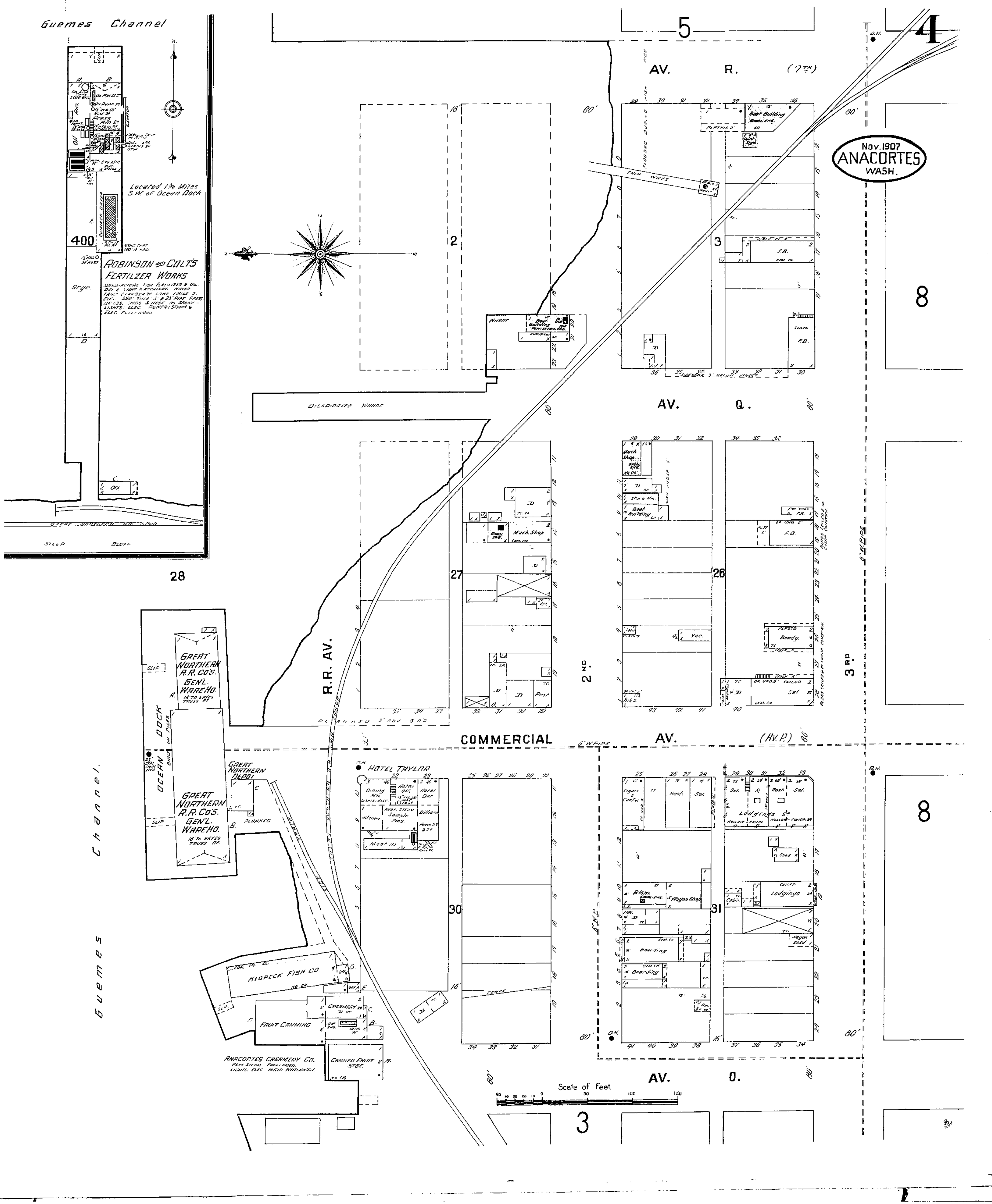
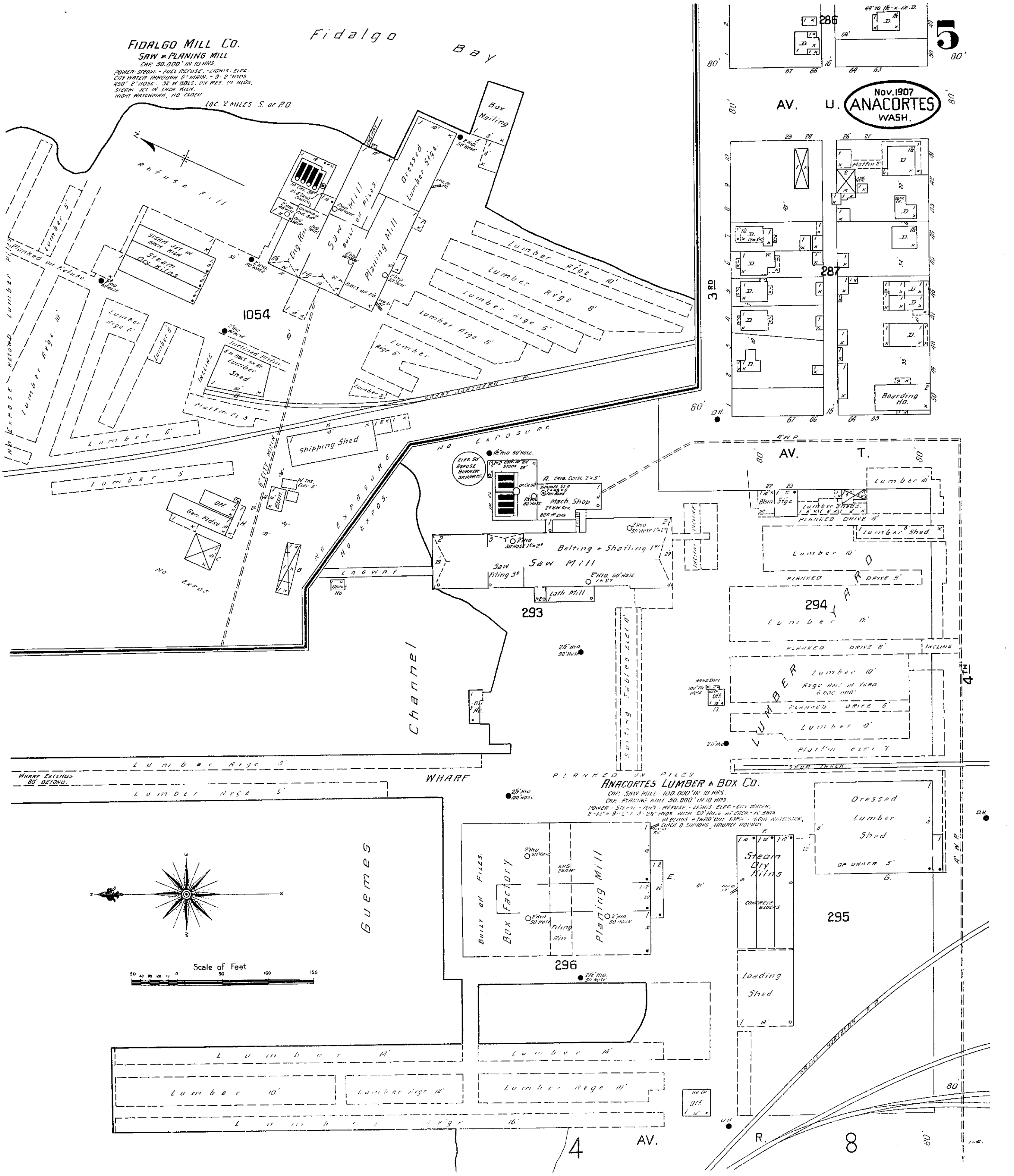
STREETS

SPECIALS.

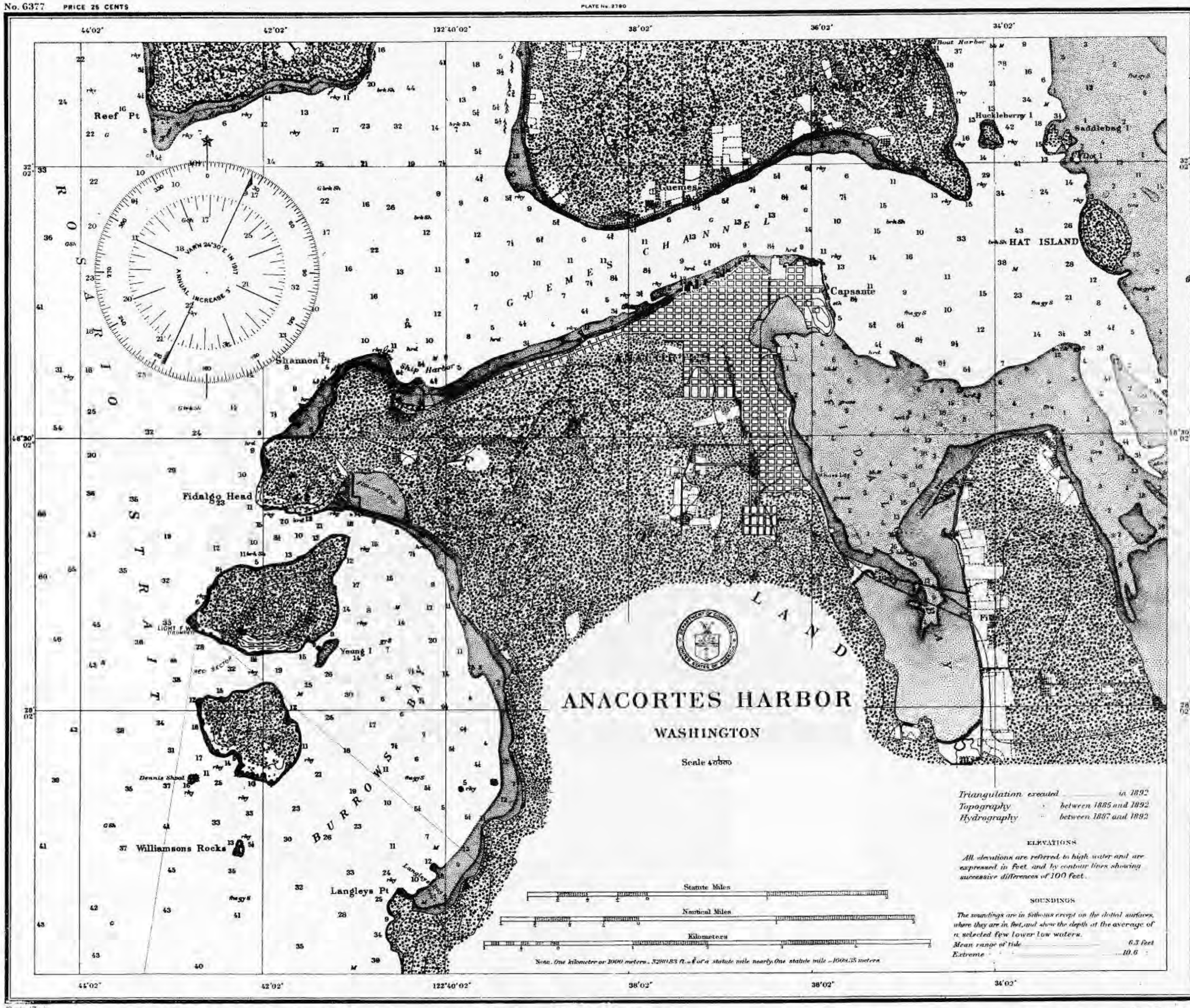
* Indicates only one side of Street shown.


4
Nov. 1907
ANACORTES
WASH.
Guemes Channel
Located 1¾ Miles S.W. of Ocean Dock
400
ROBINSON AND COLT'S FERTILZER WORKS
Steep Bluff
28
5
AV. R. (7TH)
Boat Building
Ship Ways
2
3
8
Wharf
Dilapidated Wharf
AV. Q.
Mach. Shop
Boat Building
Store Rm.
27
26
R.R. AV.
2ND
3RD
6" W. PIPE
GREAT NORTHERN R.R. CO'S. GEN'L. WAREHO.
OCEAN DOCK
Slip
COMMERCIAL AV. (AV. P.)
GREAT NORTHERN DEPOT
HOTEL TAYLOR
Dining Rm.
Hotel Off.
Hotel Bar
Billiard
Kitchen
Sample Rms.
Meat
Rest.
Sal.
Lodgings 2nd
Lodgings
Blsm.
Wagon Shop
Boarding
Cabin
Wagon Shed
30
31
KLOPECK FISH CO.
CREAMERY
FRUIT CANNING
ANACORTES CREAMERY CO.
CANNED FRUIT STGE.
Guemes Channel
AV. O.
Scale of Feet
3


5
Nov. 1907
ANACORTES
WASH.
Fidalgo Bay
FIDALGO MILL CO.
SAW & PLANING MILL
CAP. 50,000' IN 10 HRS.
LOC. 2 MILES S. OF P.O.
Refuse Fill
Box Nailing
Dressed Lumber Stge.
Saw Mill
Planing Mill
Eng. Rm.
Steam Dry Kilns
Lumber Arge 10'
Lumber Arge 8'
Lumber Arge 6'
Inclined Platfm.
Lumber Shed
Incline
Shipping Shed
Off.
Gen. Mdse.
NO EXPOSURE
NO EXPOS.
1054
AV. U.
AV. T.
3RD
4TH
286
287
Boarding Ho.
Mach. Shop
Belting & Shafting
Saw Mill
Saw Filing
Lath Mill
LOGWAY
293
294
Lumber Yard
Lumber Sheds
Lumber Shed
Planked Drive
Sorting Tables
Channel
WHARF
WHARF EXTENDS 80' BEYOND
Lumber Arge 5'
PLANKED ON PILES
ANACORTES LUMBER & BOX CO.
CAP. SAW MILL 100,000' IN 10 HRS.
CAP. PLANING MILL 50,000' IN 10 HRS.
Dressed Lumber Shed
Steam Dry Kilns
Loading Shed
Box Factory
Planing Mill
Filing Rm
BUILT ON PILES
295
296
Guemes
Scale of Feet
Lumber 14'
Lumber 10'
Lumber Arge 12'
Lumber Arge 10'
Lumber Arge 16'
4
AV.
R.
8
80'

No. 6377 PRICE 25 CENTS

PLATE No. 2790

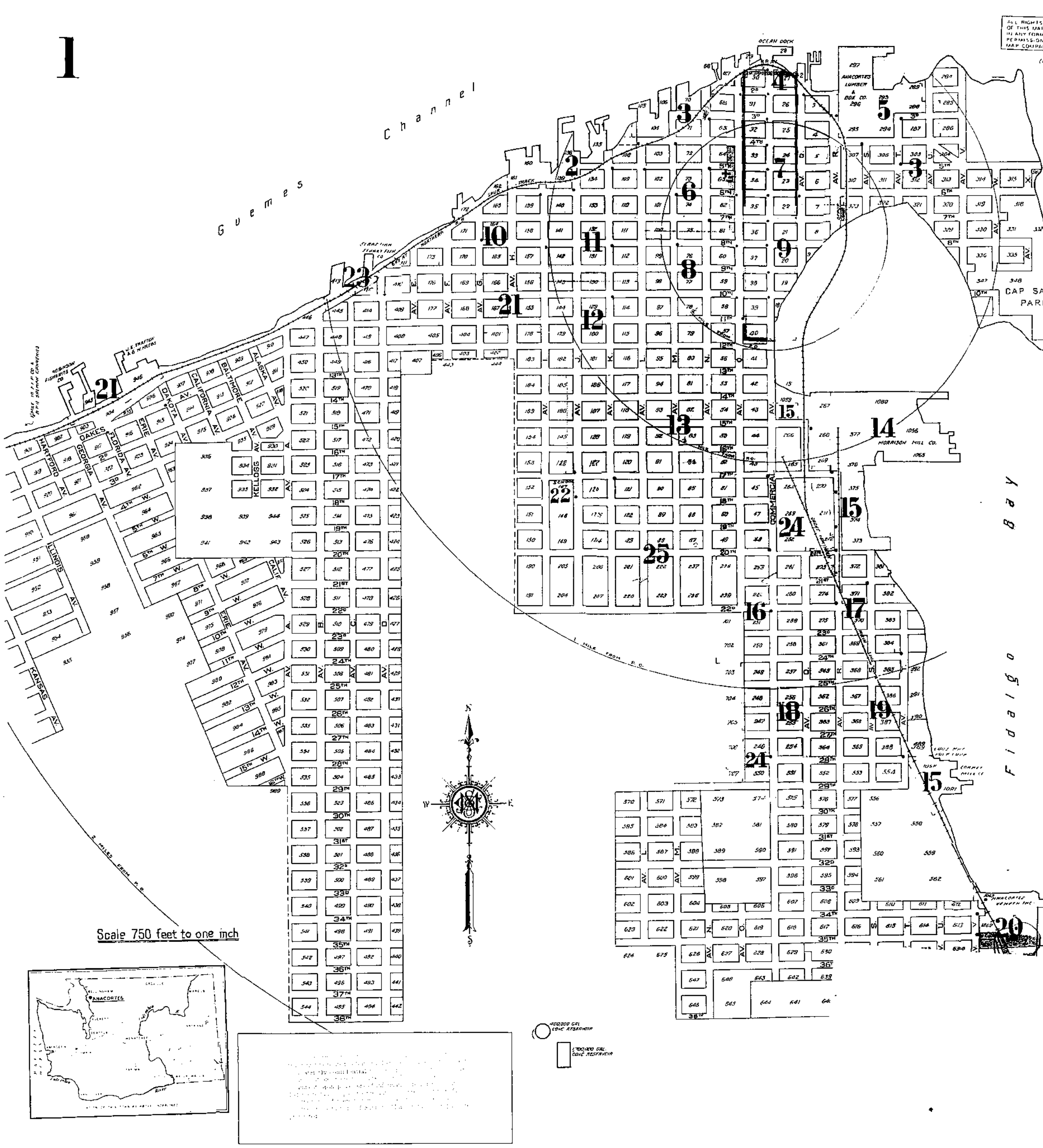


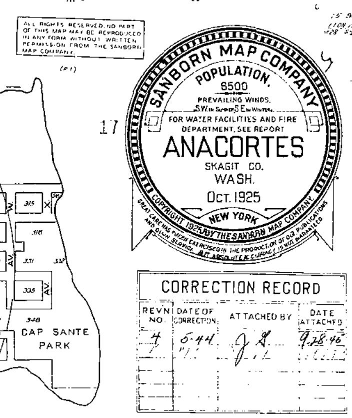
Published at Washington, D.C. June 1902; reissued Apr. 1917
BY THE U.S. COAST AND GEODETIC SURVEY
E. Lester Jones, Director.

LIGHTS, BEACONS, BUOYS, AND DANGERS CORRECTED FOR INFORMATION RECEIVED TO DATE OF ISSUE

(Anacortes Harbor) U.S.C.&G.S. 6377

WASH . . 501





Paste over Original Report. ANACORTES, WASH.

NEW REPORT, May, 1944

PAVING: 4½ miles of concrete paving.

GRADES:—Nearly level sloping slightly on all sides toward water.

WATER FACILITIES

Municipal ownership. Gravity and pumping system. Source of supply: pumped from Skagit River, 12 miles southeast of City by 2 DeLaval electric centrifugal pumps, capacity 2,300 gallons per minute and 1,000 gallons per minute through a 24" C. I. pipe. Also from Whistle Lake, 3 miles south of Post Office by a DeLaval electric centrifugal pump, capacity 3,500 gallons per minute through a 16" C. I. pipe. Both systems to a concrete reservoir, capacity 1,350,000 gallons, thence by gravity through a 24" wood main to a concrete filtering plant, located ½ mile south of City Limits, thence by gravity into 2 concrete reservoirs, capacity 1,700,000 gallons and 400,000 gallons. Reservoirs elevated 220' above mean high tide (for location, see Key Map), thence by gravity through a 16" C. I. pipe to City Mains. 115 hydrants, pressure about 75 lbs. Average daily consumption not known.

FIRE DEPARTMENT

Organized. 1 chief and 6 fully paid members and 15 volunteers, partly paid.

1 American-LaFrance 6 cylinder triple combination chemical hose and pumper auto, capacity 1,000 gallon per minute, equipped with a 150 gallon booster tank, 1,450' 2½" hose, 200' 1½" hose, 250' 1" chemical hose, one 21' extension ladder. Two 2½ gallon extinguishers. 1 American-LaFrance triple combination hose, 340 gallon booster pump, capacity 500 gallons per minute, 850' 2½" hose, 300' 1½" hose and 450' chemical hose. 1 Ford triple combination hose, 187 gallon booster tank, pump, capacity 500 gallons per minute, 2,000' 2½" hose, 400' 1½" hose and 300' chemical hose. Above equipment located at fire station in City Hall (Sheet 6).

Fire Alarm:—2 sirens, located at Fifth St. and Commercial Ave. and on telephone pole at Eighth St. and Commercial Ave.

Fire Limits:—Shown by heavy red line on Key Map.

City Limits:—Extend ¼ mile south of and parallel with Thirty-eighth St. and run east and west across Fidalgo Island at this point.

NO FIRE-RESISTIVE ROOFING ORDINANCE.

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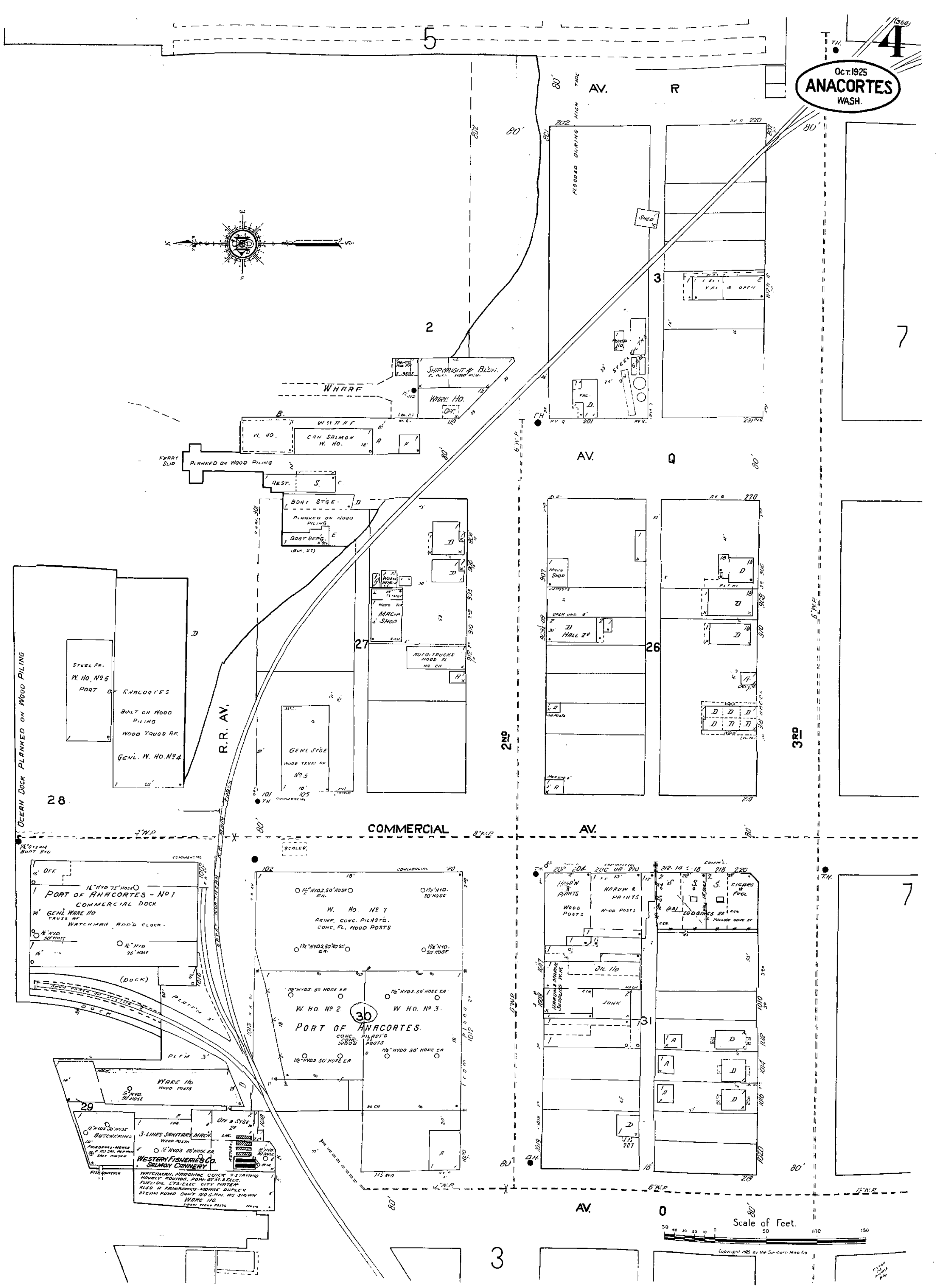
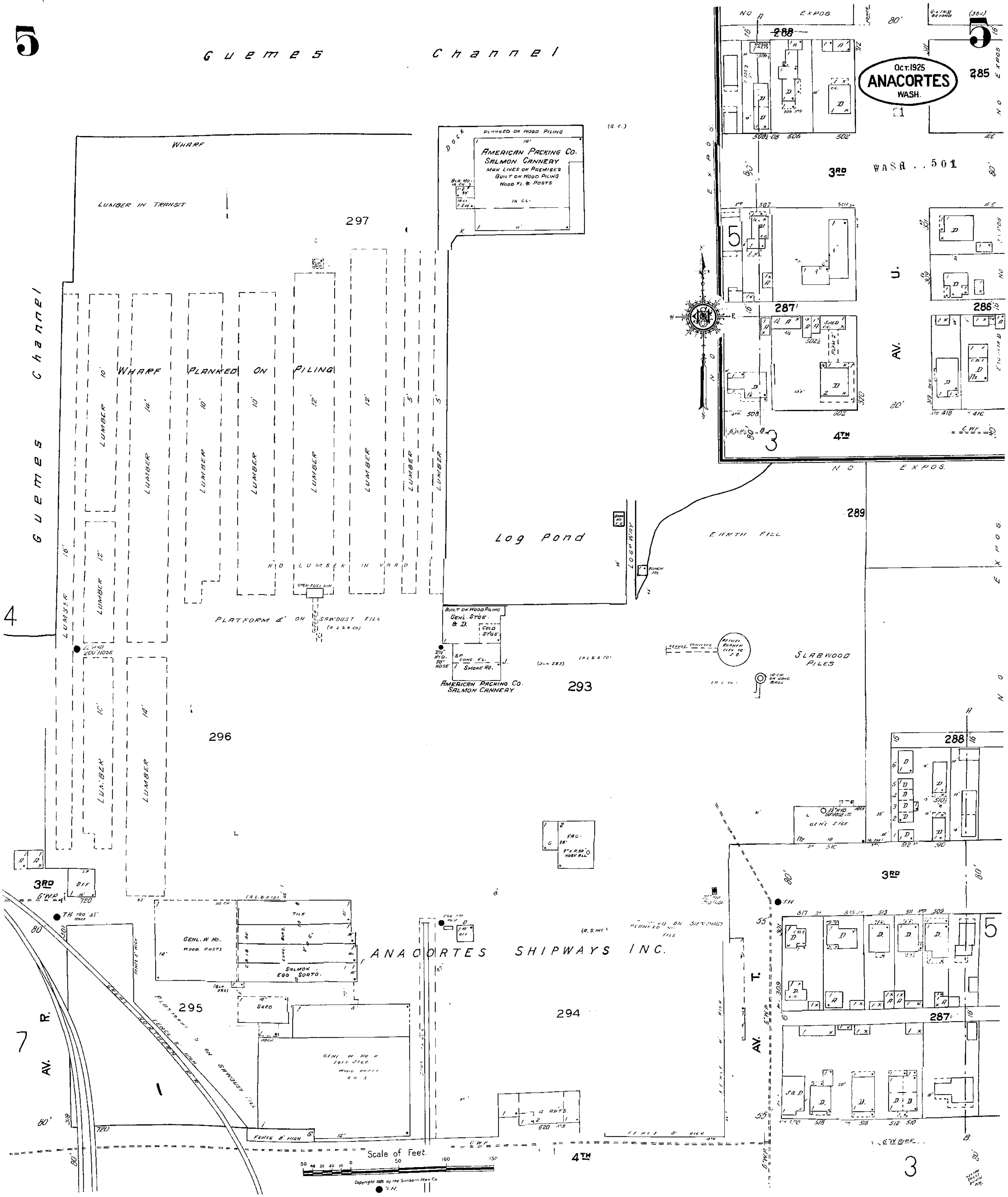


Oct. 1925
ANACORTES
WASH.
4
5
AV. R
AV. Q
AV. O
COMMERCIAL AV.
R.R. AV.
2ND
3RD
Guemes Channel
WHARF
SHIPWRIGHT & BLSM.
WIRE HO.
CAN SALMON W. HO.
W. HO.
FERRY SLIP
PLANKED ON WOOD PILING
REST.
BOAT STGE.
BOAT REP'G
FLOODED DURING HIGH TIDE
STEEL OIL TKS
MACH SHOP
HALL 2ND
AUTO. TRUCKS
STEEL FR. W. HO. NO. 6 PORT OF ANACORTES
BUILT ON WOOD PILING
WOOD TRUSS RF.
GENL. W. HO. NO. 4
OCEAN DOCK PLANKED ON WOOD PILING
GENL STGE
NO. 5
PORT OF ANACORTES - NO. 1
COMMERCIAL DOCK
GENL. WARE HO
WATCHMAN APP'D CLOCK
W. HO. NO. 7
REINF. CONC. PILAST'D.
CONC. FL. WOOD POSTS
W. HO. NO. 2
W. HO. NO. 3
PORT OF ANACORTES
WARE HO
BUTCHERING
3-LINES SANITARY MACH
WESTERN FISHERIES CO. SALMON CANNERY
HARD'W & PAINTS
HARDW. & PAINTS
OIL HO.
JUNK
LODGINGS
CIGARS & POOL
2
3
7
26
27
28
29
30
31
Scale of Feet.


Oct. 1925
ANACORTES
WASH.
Guemes Channel
Guemes Channel
WHARF
LUMBER IN TRANSIT
297
DOCK PLANKED ON WOOD PILING
AMERICAN PACKING CO.
SALMON CANNERY
MAN LIVES ON PREMISES
BUILT ON WOOD PILING
WOOD FL. & POSTS
WHARF PLANKED ON PILING
LUMBER
NO LUMBER IN YARD
PLATFORM 4' ON SAWDUST FILL
Log Pond
LOG WAY
EARTH FILL
289
BUILT ON WOOD PILING
GENL. STGE. & D.
COLD STGE.
SMOKE HO.
AMERICAN PACKING CO.
SALMON CANNERY
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SLABWOOD PILES
296
295
294
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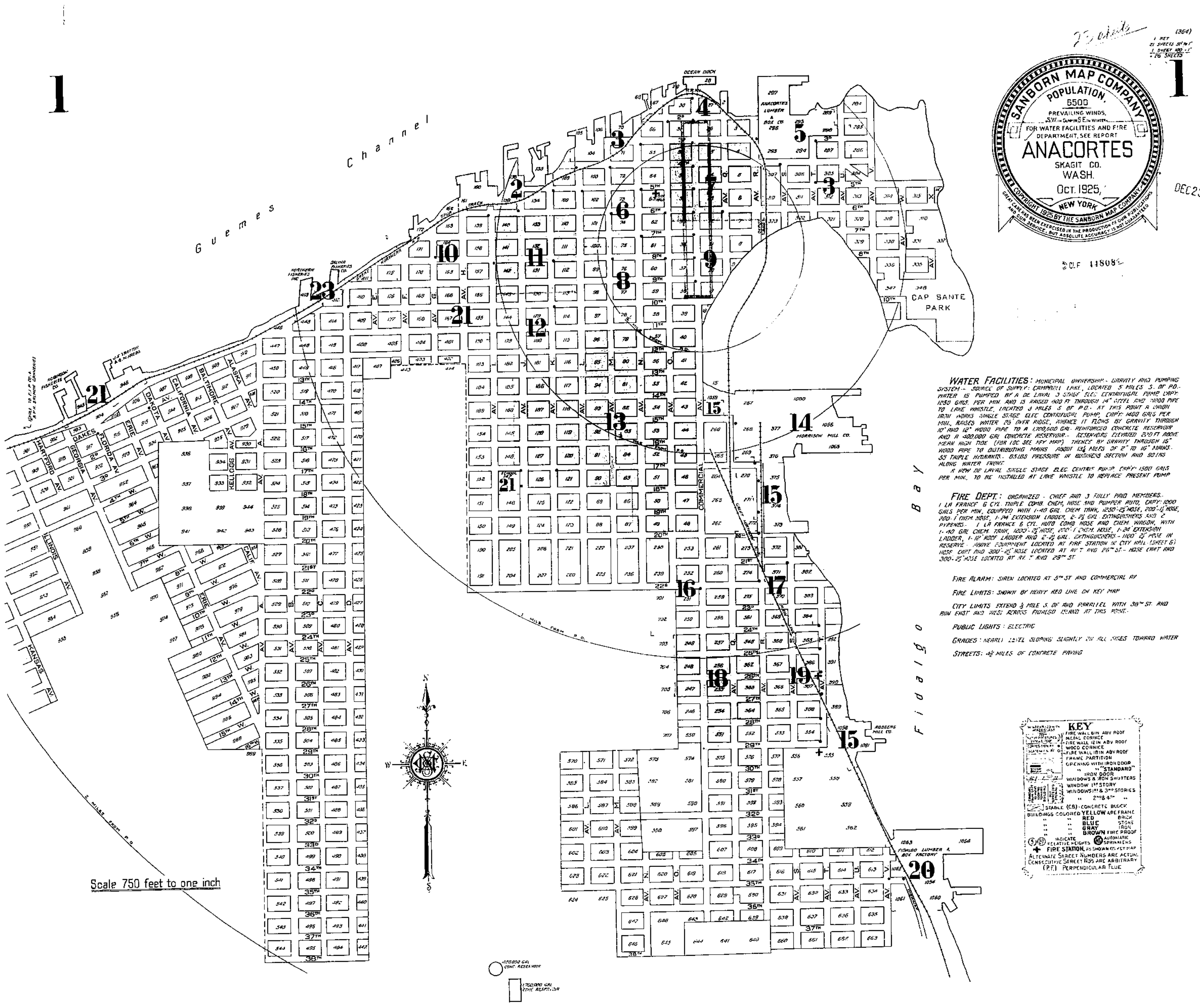
GENL. W. HO.
WOOD POSTS
TILE
SALMON EGG SORTG.
SHED
4 APTS.
FENCE 8' HIGH
GREAT NORTHERN R.R.
PLATFORM 5' ON SAWDUST FILL
3RD
4TH
R. AV.
T. AV.
U. AV.
WASH. 501
288
287
286
285
6" W.P.
NO EXPOS.
Scale of Feet.
50 40 30 20 10 0 50 100 150
Copyright 1925 by the Sanborn Map Co.
4
7
3
5



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"	1100-1321	6
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" "	801-1019	*18
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" "	800-1021	18
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*Indicates only one side of street shown.

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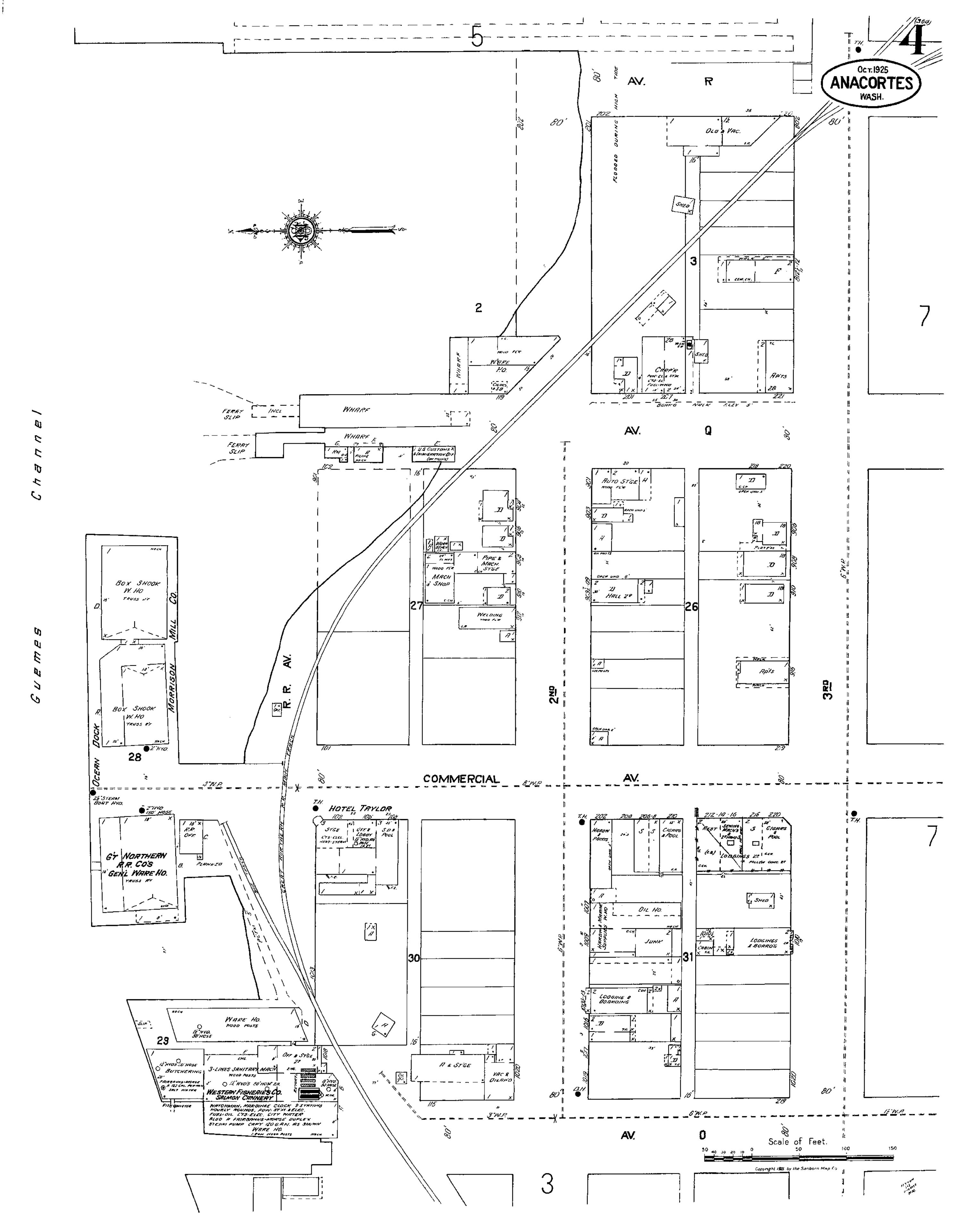

Oct. 1925
ANACORTES
WASH.
4
5
7
3
AV. R
AV. Q
AV. O
COMMERCIAL AV.
2ND
3RD
R. R. AV.
Guemes Channel
OCEAN DOCK
MORRISON MILL CO.
BOX SHOOK W. HO.
GT NORTHERN R.R. CO'S GENL WARE HO.
HOTEL TAYLOR
WESTERN FISHERIES CO. SALMON CANNERY
WARE HO.
BUTCHERING
3-LINES SANITARY MACH.
OFF & STGE
WHARF
WARE HO.
FERRY SLIP
U.S. CUSTOMS & IMMIGRATION OFF.
OLD & VAC.
CARP'R
APTS
AUTO STGE
HALL 2ND
MACH SHOP
PIPE & MACH STGE
WELDING
OIL HO.
JUNK
LODGING & BOARDING
LODGINGS & BOARDG
CIGARS & POOL
SHED
VAC & OIL RFD
A & STGE
R.R. OFF.
FLOODED DURING HIGH TIDE
Scale of Feet.
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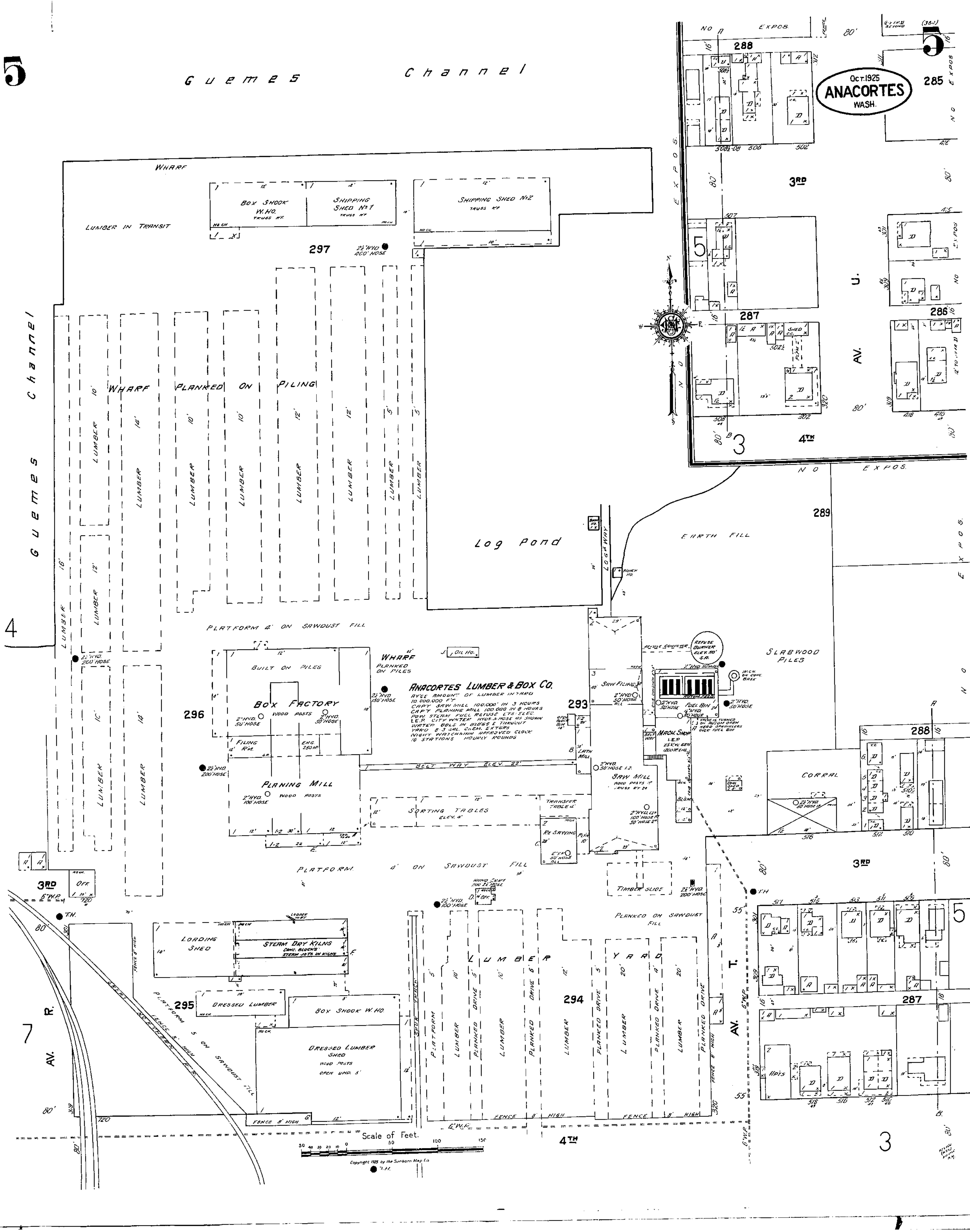
5


Guemes Channel
ANACORTES WASH. Oct. 1925
5
WHARF
LUMBER IN TRANSIT
BOX SHOOK W. HO.
SHIPPING SHED No 1
SHIPPING SHED No 2
297
WHARF PLANKED ON PILING
LUMBER
Log Pond
LOG WAY
EARTH FILL
SLABWOOD PILES
PLATFORM ON SAWDUST FILL
BUILT ON PILES
BOX FACTORY
FILING RM.
PLANING MILL
296
WHARF PLANKED ON PILES
ANACORTES LUMBER & BOX CO.
293
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SAW MILL
MACH. SHOP
REFUSE BURNER
FUEL BIN
LATH MILL
BELT WAY
SORTING TABLES
TRANSFER TABLE
RE SAWING
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DRESSED LUMBER
BOX SHOOK W. HO.
DRESSED LUMBER SHED
LUMBER YARD
294
PLANKED ON SAWDUST FILL
PLATFORM
PLANKED DRIVE
FENCE 8' HIGH
3RD
4TH
R. AV.
T. AV.
U. AV.
288
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285
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289
NO EXPOS.
Scale of Feet.
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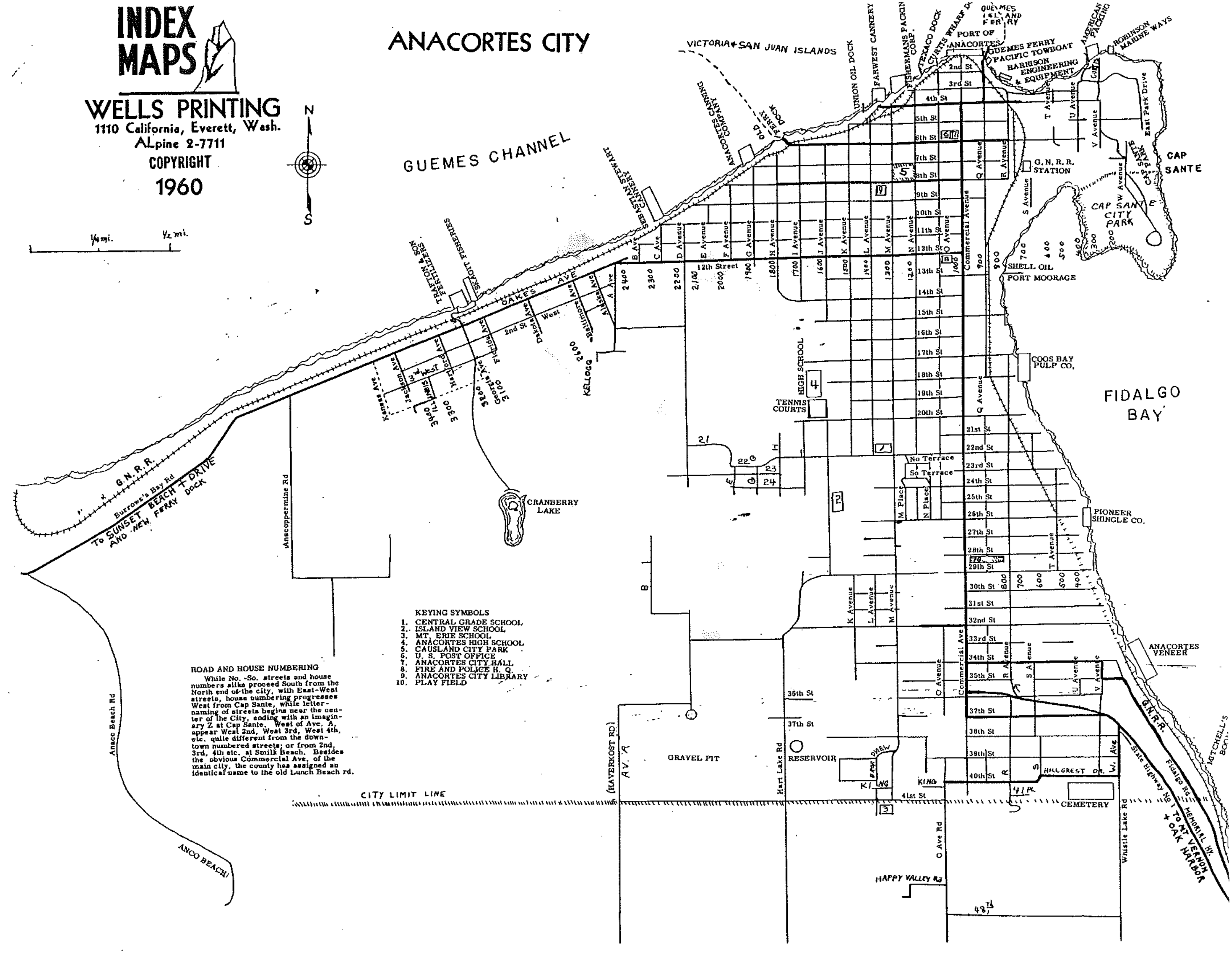
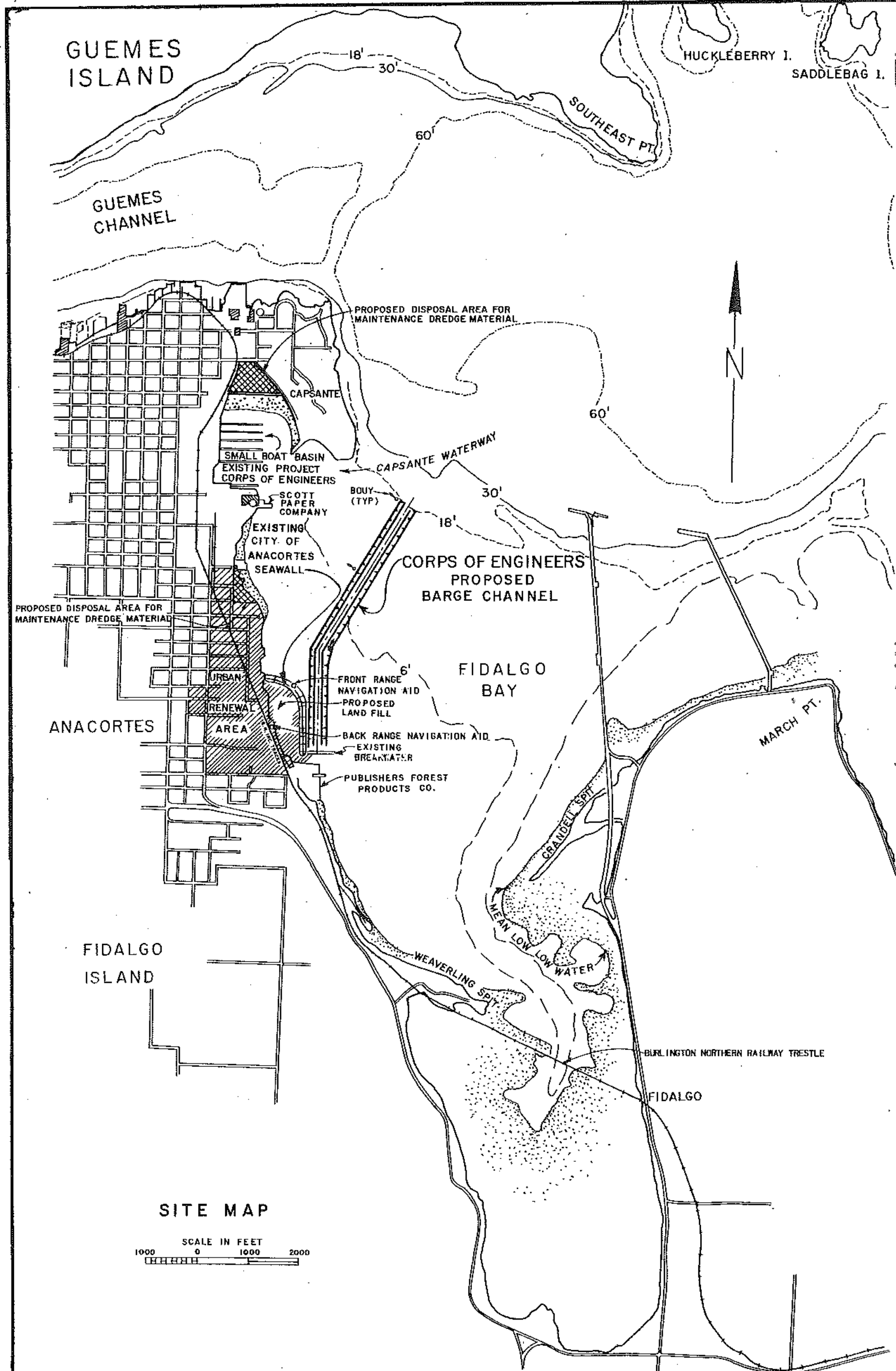
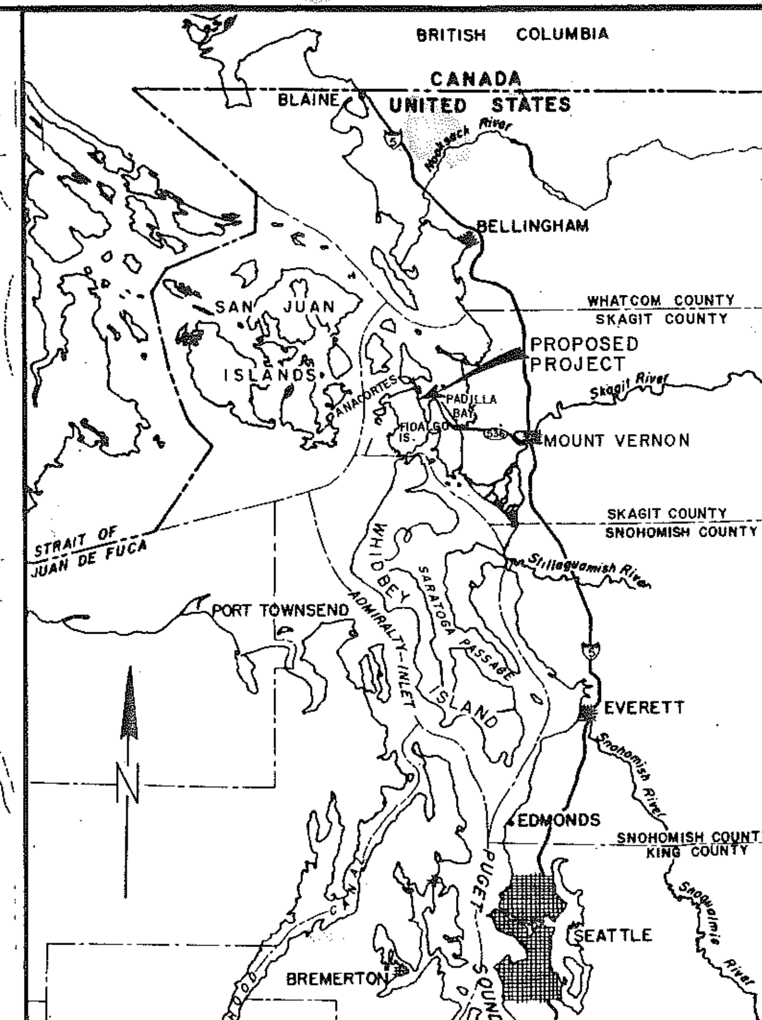
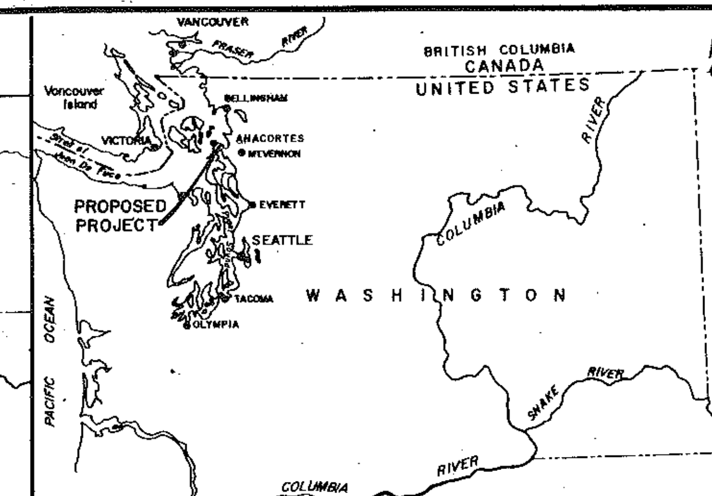

INDEX MAPS
WELLS PRINTING
1110 California, Everett, Wash.
ALpine 2-7711
COPYRIGHT
1960
ANACORTES CITY
N
S
1/4 mi.
1/2 mi.
GUEMES CHANNEL
FIDALGO BAY
CAP SANTE
CAP SANTE CITY PARK
VICTORIA + SAN JUAN ISLANDS
UNION OIL DOCK
FARWEST CANNERY
FISHERMANS PACKIN CORP.
TEXACO DOCK
CURTIS WHARF
QUEMES ISLAND FERRY
PORT OF ANACORTES
GUEMES FERRY
PACIFIC TOWBOAT
HARRISON ENGINEERING & EQUIPMENT
AMERICAN PACKING
ROBINSON MARINE WAYS
ANACORTES CANNING COMPANY
OLD FERRY DOCK
SEBASTIAN STEWART CANNERY
TRAFTON & SON FERTILIZERS
SKAGIT FISHERIES
G. N. R. R. STATION
SHELL OIL
PORT MOORAGE
COOS BAY PULP CO.
PIONEER SHINGLE CO.
ANACORTES VENEER
HIGH SCHOOL
TENNIS COURTS
CRANBERRY LAKE
GRAVEL PIT
RESERVOIR
CEMETERY
KELLOGG
OAKES AVE
Commercial Avenue
G.N.R.R.
Burrows's Bay Rd
To SUNSET BEACH + DRIVE AND NEW FERRY DOCK
Anacoppermine Rd
Anaco Beach Rd
ANCO BEACH
(HAVERKOST RD)
Hart Lake Rd
O Ave Rd
Whistle Lake Rd
HAPPY VALLEY Rd
HILLCREST DR.
State Highway No 1 TO MT VERNON + OAK HARBOR
Fidalgo Rd MEMORIAL HY
MITCHELL'S BO...
CITY LIMIT LINE
KEYING SYMBOLS
1. CENTRAL GRADE SCHOOL
2. ISLAND VIEW SCHOOL
3. MT. ERIE SCHOOL
4. ANACORTES HIGH SCHOOL
5. CAUSLAND CITY PARK
6. U. S. POST OFFICE
7. ANACORTES CITY HALL
8. FIRE AND POLICE H. Q.
9. ANACORTES CITY LIBRARY
10. PLAY FIELD
ROAD AND HOUSE NUMBERING
While No.-So. streets and house numbers alike proceed South from the North end of the city, with East-West streets, house numbering progresses West from Cap Sante, while letter-naming of streets begins near the center of the City, ending with an imaginary Z at Cap Sante. West of Ave. A, appear West 2nd, West 3rd, West 4th, etc. quite different from the downtown numbered streets; or from 2nd, 3rd, 4th etc. at Smilk Beach. Besides the obvious Commercial Ave. of the main city, the county has assigned an identical name to the old Lunch Beach rd.





LOCATION MAP
PUGET SOUND AND ITS TRIBUTARY WATERS

Scale in Miles
10 0 10 20



VICINITY MAP
Scale in miles
10 0 50

TIDE DATA ANACORTES, WASHINGTON	
DATUM PLANE	ELEVATION REFERRED TO MLLW
HIGHEST TIDE(ESTIMATED)	11.0
MEAN HIGHER HIGH WATER	8.2
MEAN HIGH WATER	7.4
MEAN (HALF) TIDE LEVEL	5.0
MEAN LOW WATER	2.6
MEAN LOWER LOW WATER	0.0
LOWEST TIDE (ESTIMATED)	4.5

TIDAL DATUM PLANES ARE BASED ON 3 YEARS (1 JUNE 1921-31 MAY 1924) OF GAGE READINGS BY THE U.S. COAST & GEODETIC SURVEY.

NOTES:

1. ELEVATIONS ARE IN FEET AND ARE MEASURED FROM THE U.S. C.&G.S. PLANE OF MEAN LOWER LOW WATER. ELEVATIONS BELOW THE DATUM PLANE ARE PREFIXED WITH A MINUS (-) SIGN.

ANACORTES, WASHINGTON

PROPOSED NAVIGATION CHANNEL

SITE, LOCATION AND VICINITY MAPS

In 3 sheets Sheet No. 1
U. S. Army Engineer District, Seattle, Wash. Jan 1973
Prepared: Foster Submitted:
Chief, Section
Recommended: Approved:
Chief Basin Planning Branch Chief, Engineering Division
Drawn by: Transmitted with report File No.
Traced by: dated E-6-1-83
Checked by:

APPENDIX E
ARCHAEOLOGICAL MONITORING PLAN

Archaeological Monitoring Plan for the Port of Anacortes Former Scott Paper Mill Site Cleanup Project #ENV-01 Anacortes, Skagit County, Washington

Submitted to

Port of Anacortes
P.O. Box 297
Anacortes, Washington 98221

Submitted by

HRA
HISTORICAL RESEARCH ASSOCIATES, INC.

Jennifer Gilpin, M.A.
Gail Thompson, Ph.D.
Seattle, Washington

April 2009

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1.0 Introduction and Project Description

The Port of Anacortes (Port) is under an Agreed Order with the Washington State Department of Ecology to clean up contaminated soil, sediment, and wood waste at the former Scott Paper Company lumber mill (Scott site) in Anacortes. The mill was developed before 1890 by filling along the shoreline of Fidalgo Bay. The site was used for lumber, box making, and pulp production, with processes that resulted in pollution from dioxins and furans, carcinogenic polycyclic aromatic hydrocarbons, and polychlorinated biphenyls. The Remedial Investigation (RI) and Feasibility Study (FS) conducted for the Port by GeoEngineers recommended remediation activities in the upland and marine portions of the site. The site is located along the western shore of Fidalgo Bay and bounded by Seafarers' Way to the north, Q Avenue to the west, and approximately 19th Street to the south (Figure 1). It is in the northeast quarter of Section 19 of T35N, Range 2E, and shown on the 1998 U.S.G.S. Anacortes 7.5-minute North quadrangle map.

Figure 2 shows the limits of the Project area, divided into four quadrants: Port Upland, Port Marine, MJB Upland, and MJB Marine areas. To avoid affecting potential prehistoric and historic-period archaeological deposits, the Port contracted with Historical Research Associates, Inc. (HRA) to perform a cultural resources assessment of the Project area. Based on research into the geomorphic and historic development of the Project area, and due to the resulting potential for encountering intact prehistoric, ethnohistoric, and early historic-period archaeological remains in the upland portions of the Project area, HRA recommended archaeological monitoring during excavation in several locations (Section 2.0) (Thompson et al. 2009).

The Port then contracted with HRA to prepare an archaeological monitoring plan with unanticipated discovery procedures for the Project. This monitoring plan provides information on the environmental and cultural context as well as the archaeological potential of Project area (Sections 3.0-5.0). The plan then describes procedures for archaeological monitoring (Section 6.0) and those for treating unanticipated discoveries of archaeological remains (Section 7.0) and human remains (Section 8.0) during ground disturbance at the Project. A list of references cited (Section 9), an Archaeological Monitoring Supervisory Plan (Appendix A), and a list of contacts (Appendix B) complete the Monitoring Plan.

This document is intended to:

- Comply with the Port’s U.S. Army Corps of Engineers (Corps) special permit conditions s, t, and u.
- Comply with applicable laws and regulations, particularly 36CFR Part 800 “Protection of Historic Properties” which implements Section 106 of the National Historic Preservation Act of 1966, as amended; Title 27 Revised Code of Washington, Chapter 27.44 Indian Graves and Records; and Chapter 27.53 Archaeological Sites and Resources.
- Describe to the Samish Indian Tribe, Swinomish Tribal Community, State Department of Archaeology and Historic Preservation (DAHP), and the Corps the procedures the Port will follow to conduct archaeological monitoring and address any unanticipated discoveries of archaeological resources or human remains.

- Provide direction and guidance to Project personnel about the procedures to be followed should the discovery of archaeological resources or human remains occur.

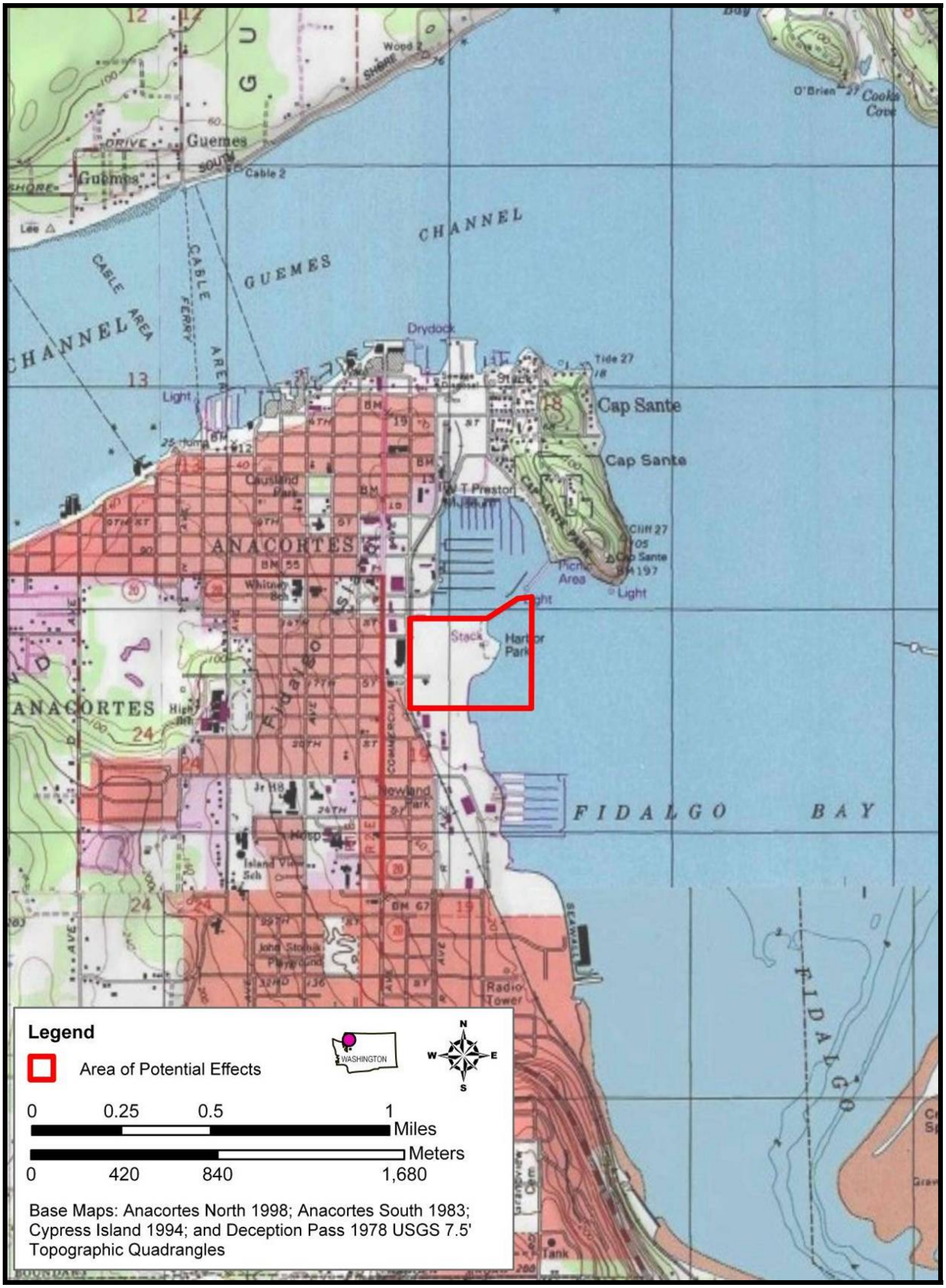

Figure 1. Project location and Area of Potential Effects.

Figure 2. Project limits (Marine areas are not included in Monitoring Plan [Thompson et al. 2009]).

2.0 Area of Potential Effects and Native American Consultation

2.1 Project Area of Potential Effects

The Area of Potential Effects (APE) consists of the area within which ground disturbance could affect human remains or archaeological remains that are eligible for listing in the National Register of Historic Places, if such remains are present. The Project's APE consists of the upland and marine areas bordered on the north by Seafarers' Way and the breakwater at the east end of it, on the east by a line (the inner harbor line) extending out from the end of the breakwater and running south to about 1,000 ft (305 m), and on the west by the east side of Q Avenue running north to Seafarers' Way. The APE is comprised of historical fill deposited over the western part of Fidalgo Bay, reaching a depth of 7-10 ft (2-3 m) below ground surface in the western part of the site and about 15 ft (4.6 m) below ground surface near the current shoreline of Fidalgo Bay.

The Port conducted a cultural resources assessment for Project (Thompson et al. 2009). Prehistoric, ethnohistoric, and early historic-period archaeological remains associated with shallow water activities could be present in the Port and MJB Upland Areas. HRA recommended archaeological monitoring of excavation activities in these two areas for the following depths (Thompson et al. 2009:27). HRA did not recommend archaeological monitoring for the Port and MJB Marine Areas because past dredging in these areas would have removed any intact archaeological materials.

2.1.1 Port Upland Area

Existing archaeological materials would most likely be encountered beneath historical fill in this location about 7 – 10 ft (2-3 m) below ground surface (BGS) west of R Avenue and about 15 ft (4.6 m) BGS east of R Avenue. HRA therefore recommended that the Port provide for archaeological monitoring of excavations below 5 ft (1.5 m) BGS west of R Avenue and below 13 ft (4 m) east of R Avenue. Archaeological monitoring would thus begin just above the anticipated depth of fill so that any excavations into native sediments would observe archaeological materials that might be present on top or in the upper portion of these sediments. Monitoring should continue to the depth at which cultural materials would no longer reasonably be present – at this location, HRA recommends monitoring until approximately 1 m (3.28 ft) of intact native tidal sediments have been observed, if excavation continues to the point at which native soils and sediments are exposed. If archaeological or human remains are found in this upper portion of tidal sediments, monitoring would continue until the supervising archaeologist (if that person is different from the archaeological monitor) determines that the potential for encountering archaeological or human remains is extremely low.

2.1.2 MJB Upland Area

Existing archaeological materials would occur beneath historical fill in this location about 4.5 ft (1.4 m) BGS in the western portion and about 5.5 ft (1.7 m) BGS in the eastern portion of the MJB Upland Area. Remedial excavations proposed by the Port include some areas potentially reaching 6 ft (1.8 m). HRA recommends that the Port provide for archaeological monitoring of excavations below 3 ft (0.9 m) in all areas of the MJB Upland Area. As with the Port Upland

Area, archaeological monitoring would thus begin just above the anticipated depth of fill so that any excavations into native sediments would observe archaeological materials that might be present on top or in the upper portion of these sediments. Monitoring should continue to the depth at which cultural materials would no longer reasonably be present – as with the Port Upland, HRA recommends monitoring until approximately 1 m (3.28 ft) of intact native tidal sediments have been observed, if excavation continues to the point at which native soils and sediments are exposed. If archaeological or human remains are found in the upper portion of tidal sediments, monitoring would continue until the supervising archaeologist (if that person is different from the archaeological monitor) determines that the potential for encountering archaeological or human remains is extremely low.

2.2 Native American Consultation

The Port of Anacortes sent consultation letters to the Samish Indian Nation and the Swinomish Indian Tribal Community describing the Project and requesting information on potential cultural resources and concerns of the tribes. Port staff met with Diana Barg, Cultural Resource Program Manager for the Samish Indian Nation on December 16, 2008. Ms. Barg stated that she did not know of specific tribal use of the Project area but cautioned that most of the Fidalgo Bay shoreline had likely been used for shellfish harvesting, making the Project area sensitive for archaeological remains. The Port has not received a response from the Swinomish cultural resources representative.

3.0 Environmental Setting

The following sections provide a brief overview of the natural history of the Scott site Project area. This information is drawn from HRA's cultural resources assessment for the Scott Paper Project (Thompson et al. 2009), which in turn cites the Port's previous cultural resource investigations for the Cap Sante Marine clean-up site, located just north of the Former Scott Paper Site (Gilpin and Thompson 2008; Goetz et al. 2007).

3.1 Geomorphic Setting

The Project area is situated between 0 and 20 feet (ft) (6.1 meters [m]) above mean sea level (amsl) on Fidalgo Island, at the northwestern corner of Fidalgo Bay. Fidalgo Island is situated within the Puget Trough physiographic province (Franklin and Dyrness 1973).

HRA staff researched various sources of information to better understand the Project area's geomorphology and potential for intact prehistoric and historic-period archaeological resources. These sources included in the Project area Remedial Investigation (RI), which GeoEngineers et al. (2008) prepared for the Port, and the State Department of Natural Resources geology and ground water website, which led to other online sources. These included the Georgia Basin - Puget Sound Research Conference website and the Skagit River System Cooperative website. An HRA project archaeologist analyzed this information to understand the nature and age of deposits across the Project area, including processes of deposition, removal, erosion, and stability.

The Project area is situated on filled-in or dredged former shallow tidelands. Currently, the area is both above and below mean lower low water (MLLW). Both the fill and dredged areas have multiple histories, associated with specific events that took place on individual parcels. The following sections discuss the Port Upland Area and the MJB Upland Area.

Port Upland Area

The majority of the Port Upland Area is located on former shallow tidelands. Before 1800, the Project area contained a pocket estuary directly north of the Port Upland Area. Since then, multiple layers of historical fill have been deposited on top of native glacial deposits and marine sediment, and the pocket estuary no longer exists (McBride and Beamer 2007). Surficial soils consist primarily of recent gravel and sand fill, occasionally mixed with wood debris (GeoEngineers et al. 2008:5). In 1994, dredged sand from Swinomish Channel was used as a geotechnical load in the Port Upland Area (GeoEngineers et al. 2008:4). In 1995, this preload material was shifted, and combined with wood waste and bark remnants from the log storage yard used between 1990 and 1993 in Parcels 1 and 2 (GeoEngineers et al. 2008:4).

The eastern half of Parcel 1 contains fill 15 ft (4.6 m) thick or greater, but this fill ranges from 7 to 10 ft (2-3 m) thick on the parcel’s western half. The fill’s upper 5 ft (1.5 m) consists mostly of dark gray sand with silt. Underlying the top layer, the fill contains primarily wood debris, such as sawdust, wood chips, and lumber, but also some metal debris and wire mixed in. In the parcel’s center, the wood debris overlies a thin layer of gravel, which is directly above native gray, very stiff silt. Elsewhere in the parcel, the wood debris directly overlies the native gray, very stiff silt layer (GeoEngineers et al. 2008:26). Between 1990 and 1993, soil was imported from the Anacortes treatment works property to replace wood bark that had been removed from Parcel 1. This replacement material allegedly consisted of dredged materials from the U.S. Army Corps of Engineers (USACE) expansion and dredging of the Cap Sante Marina in 1968 (GeoEngineers et al. 2008:4). From 1990 to 1993, the area was used as a log storage yard (GeoEngineers et al. 2008:4), so some of this debris may date from this time. Soil was removed and a sheet pile wall was constructed in Parcel 2 between 1998 and 2000 (GeoEngineers et al. 2008:4).

Parcel 3 soil generally consists of silty, gravelly sand fill overlying black, sandy silt fill, which occasionally contains wood debris. The thickness of the fill and its individual layers varies widely. The lower black, sandy silt fill may have been placed on the parcel as a preload in 1994. Its thickness ranges from 6 ft (1.8 m) to 11.5 ft (3.5 m) in the eastern portion of the parcel. The black, sandy silt fill overlies a layer of wood debris consisting of sawdust, wood chips, and lumber. Along Seafarers’ Way and R Avenue, wood debris thickness ranges from 8.5 ft to 10.5 ft (2.6 – 3.2 m). The wood debris generally lies directly on top of native gray silt, which was encountered at 21 ft (6.4 m) below ground surface (BGS) in soil borings and soil test pits conducted by Advanced Soil Mechanics in 1993 and Earth Tech in 1998 (GeoEngineers et al. 2008:26).

MJB Upland Area

As with the Port Upland Area located directly to the north, much of the MJB Upland Area is located on former shallow tidelands. Multiple layers of historical fill overlie native glacial deposits and marine sediment. Surficial soils consist primarily of recent gravel and sand fill, occasionally mixed with wood debris (GeoEngineers et al. 2008:5). The uppermost fill layer consists of very dark grayish brown gravels with silt and sand (GeoEngineers et al. 2008:27), which reaches depths of at least 2 ft (0.6 m) BGS (GeoEngineers et al. 2008:35). A variety of sand, gravel and silt layers, all mixed with varying types and amounts of wood by-products, lie underneath (GeoEngineers et al. 2008:27). Wood waste and soft soils were removed and replaced with granular fill between 1981 and 1983 (GeoEngineers et al. 2008:5). Standard Penetration Test MW-7 revealed that 4.5 ft of fill overlies a thick layer of mottled, native sediments in the western portion of the MJB Upland Area (GeoEngineers et al. 2008:Appendix A, Log of Well No. MW-7). Geoprobe macro-core sample PP-6 ascertained that patches of soils and wood by-products remain in some parts of the eastern portion of the MJP Upland Area. Fill appeared above 5.0 BGS. Matted wood fibers were found 5.0 to 5.5 ft BGS, and soft silt was found 5.5 to 9.0 ft BGS. Native sediments were found 9.0 ft BGS (GeoEngineers et al. 2008:Appendix U, Log of Boring PP-6).

4.0 Cultural Setting

The following sections provide a brief overview of the cultural background for the Scott site Project area. This information is drawn from HRA's cultural resources assessment for the Scott Paper Project – please refer to this source for additional information about the cultural setting of the Project area (Thompson et al. 2009).

4.1 Prehistory

Most current archaeological research indicates that people have lived in and utilized the resources of western Washington more or less continuously from approximately 11,000 years ago. Researchers have created several chronological sequences that describe the timing and nature of cultural change in the Pacific Northwest. Ames and Maschner's (1999) chronological sequence is divided into five prehistoric developmental periods: Paleo-Indian, Archaic, Early Pacific, Middle Pacific, and Late Pacific. The archaeological evidence from these periods suggests a gradual shift from small nomadic groups relying on generalized hunting and gathering to larger sedentary groups with increased social complexity and specialized reliance on marine and riverine resources (Ames and Maschner 1999:6).

4.2 Ethnographic Land Use

The Project area is located in the traditional territories of the Samish Indian Nation (Samish) and the Swinomish Indian Tribal Community (Swinomish). Both peoples are identified with the Coast Salish linguistic and culture area. The Samish occupied Samish, Guemes, Fidalgo, Cypress, and Lopez Islands, while the Swinomish occupied Smith Island, Hat Island, located in Similk Bay and northern Skagit Bay, and portions of Whidbey Island (Spier 1936; Suttles 1951; Suttles and Lane 1990; Swanton 1952).

Suttles (1951:42) shows the location of a Samish winter village on Guemes Island, on the northern shore of Guemes Channel, west of the ferry landing. In 1792, Spanish explorers reported two large houses standing on the northwest point of the channel. Conditions became crowded there, and some of the people moved across the channel to a village called “ironwoods” in the Straits Salish language, on the northern shore of Fidalgo Island. Swanton (1952:437) lists a

Samish village named *Hwaibathl* at Anacortes, but this location does not match the far more detailed information that Suttles reported. Winter villages included one to several plank houses, constructed of cedar boards lashed to large posts by ropes made from inner cedar bark. Multiple families resided within these houses, forming a complex community structure. The Samish and Swinomish traveled to seasonal camps in the island uplands or the mainland during the spring, summer, and fall to fish, hunt, gather plant resources, visit, and trade (Suttles 1951, 1990).

Subsistence focused on seasonal harvests of salmon and shellfish (Haeberlin and Gunther 1930; Suttles and Lane 1990). In addition to marine resources, plants and berries were gathered including camas, hazelnuts, blackberries, salmonberries, wild carrot, onion and wapato (Haeberlin and Gunther 1930). Hunting land mammals provided a large share of food for these groups; men specialized in the pursuit of deer, elk, bear, and beaver (Haeberlin and Gunther 1930; Suttles and Lane 1990).

In 1855, both the Samish and Swinomish people signed the original Treaty of Point Elliott, and were assigned to reservations (the Swinomish to their own, and the Samish to the Swinomish and Lummi Reservations). Through the late 19th and early 20th centuries, the Samish and Swinomish continued to hunt and fish, and they also worked in the growing farming, logging, and milling industries (Cole and Darling 1990).

As discussed above, Indian villages were located in the general vicinity of the Project area (Swanton 1952:437). The geographer T. T. Waterman (see Hilbert et al. 2001) noted several ethnographic place names in the vicinity of the Project area, including *K!aix* for "a promontory at the town of Anacortes" (Cap Sante) and *Dugwa'l tc*, "protected place where there is calm water," for Fidalgo Bay (Hilbert et al. 2001:349, 351, 354). Suttles' (1951:42) map of Samish territory shows no place names near the Project area. Other than the name for Fidalgo Bay, HRA's research located no Native American place names for the Project area.

4.3 Historic Period

Anacortes was platted in 1890, immediately following an economic boom that anticipated the area would be the terminus of the James J. Hill's Northern Pacific Railroad (NPR). Unfortunately, Tacoma was selected as the NPR terminus, and the Anacortes economy faltered by 1891. Two years later, Anacortes and the rest of the United States suffered the panic of 1893 (Wollam 1967:1, 4, 14). Fortunately, however, businesses recovered through the decade, as the establishment of the fish cannery industry in town paved the way for various ventures, including two codfish plants, six salmon canneries, nine fisheries, three sawmills, seven shingle mills, a planing mill, a creamery, and a fruit cannery (Dwelly and Dwelly 1979; Inter-State Publishing Company 1906). At least two railroad lines were operated in the Anacortes vicinity at the turn of the 20th century. One of these, the Great Northern Railroad, constructed a line through Anacortes in the late 1800s, and by 1905, a spur ran from the vicinity of 23rd Street north along R Avenue to the Project area.

Particularly relevant to the development of the Project area vicinity is the lumber milling industry. For many years, as in other parts of the Pacific Northwest, the logging and milling industries dominated Anacortes' economy. The first sawmill on Fidalgo Island was established at Deception Beach in 1878. Within a few years, several more operational sawmills and lumber and box-mills were established in Anacortes, both along the Guemes Channel and on the western and southern sides of Fidalgo Bay (Slotemaker n.d.:6-7). The closest major mills to the Project area were located at the foot of 15th and 16th Streets at their intersection with R Avenue.

The 1890 Sanborn map of Anacortes does not show the Project area. A hand-drawn U.S. Coast & Geodetic Survey chart dating to 1891 shows an unaltered shoreline located just west of the what is now R Avenue at 17th Street. This map shows a trail running along the shoreline between the Cap Sante area and location(s) south of the Project area. The location of this historical shoreline is corroborated by a 1902 U.S. Coast and Geodetic Survey chart. The 1892 Sanborn map shows the Skagit Mill Company facility located primarily on a wharf extending from the shoreline into Fidalgo Bay. This was the first of several names given to the facility before it became known as the Morrison Mill. The 1892 map shows an area just to the north of the mill used for "sawdust and refuse filling," in which mill by-products were already affecting the shape of its shoreline. The 1897 and 1903 Sanborn maps show similar configurations of the mill.

The 1907 Sanborn map shows a shoreline more similar to that of today although it extends somewhat farther north than the contemporary southern boundary of the Cap Sante Boat Haven. While the 1925 Sanborn map shows the Morrison Mill as extending several blocks to the east of R Avenue, it is likely that the fire insurance maps more accurately depict the location of buildings and structures rather than the position of the shoreline. Much of the Morrison Mill and Scott Paper Anacortes Pulp-Mill stretched over the water. The U.S. Army Corps of Engineers has produced a map showing the profile of the shoreline and reflecting the extensive filling that took place in the Project area from 1891 to the present (Figure 3).

Throughout its more than 75-year history, the mill experienced changes in name as well as growth in the number, size, and complexity of its facilities. Sanborn fire insurance maps record the mill's name as the Skagit Mill Company in 1892 and 1897, manufacturing rough and dressed lumber. Rodger's Saw Mill & Box Factory appears on the 1903 and 1905 maps, followed by Rodgers Lumber Company, "saw, planing mill, and box fact." in 1907. By 1925 it was called the Morrison Mill Company Saw Mill and Box Factory and in 1950, the Coos Bay Pulp Corporation Morrison Mill Division Saw Mill. The mill appears to have maintained its approximate size between 1892 and 1905, while its size increased somewhat by 1907 and considerably by 1925, retaining its larger size in 1950.

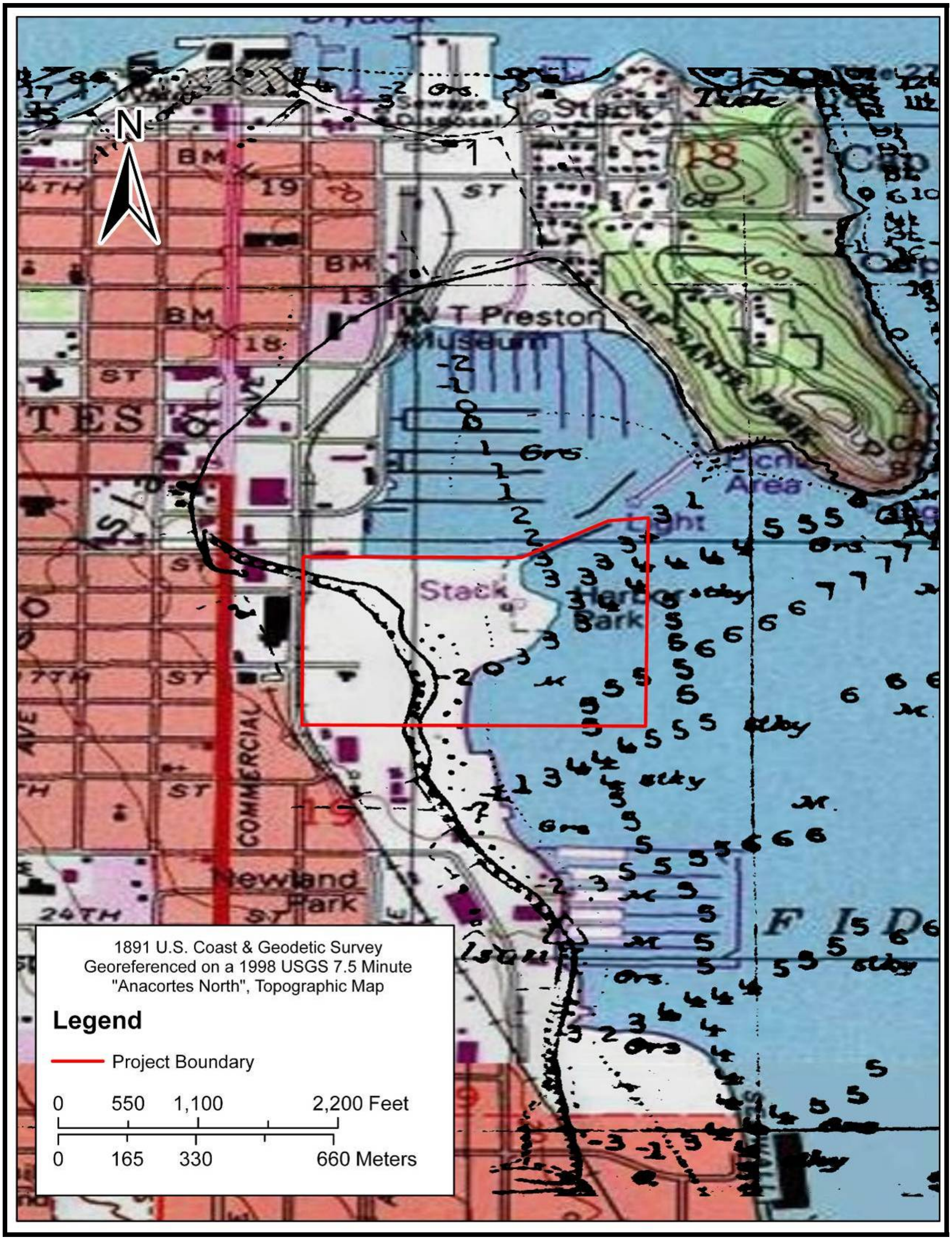

Figure 3. Shoreline changes from 1891 to the present

On Thursday November 27, 1924 the *Anacortes American* reported that capital and arrangements had been made for the construction of the Fidalgo Pulp Manufacturing mill in what is now the Project area, with optimistic investors and speculators including Lewis Muensch, Ossian Anderson, William Morrison and R.S. Talbot. The mill was would benefit from by-products of the Morrison lumber mills and the Fidalgo Lumber & Box Co., waste hemlock and spruce. These waste product materials could be sold to the pulp mill more cheaply than raw lumber and also alleviated the need for the pulp mill to have sawmilling and de-barking machinery on site. The Fidalgo Pulp Manufacturing plant was one of the first to use waste wood instead of raw lumber (*Anacortes American* Dec. 17, 1925). The mill also took advantage of a "plentiful supply of filtered water" that the City of Anacortes was willing to supply, benefiting the City by providing a monthly income.

Planning to open the pulp mill by June 1, 1925, the investors began driving pilings to construct the foundations in January of that year. Work proceeded at a rush pace with the impending arrival of the materials for the 56-foot-tall and 130-ton pulp digester scheduled for early February (*Anacortes American* Jan.8, 1925). The business venture met its goal and proved to be a profitable producer of unbleached sulphite-pulp by the summer of 1925. Fire struck the digester building in November of 1925, but repairs were completed by mid-December in anticipation of an even more profitable year in 1926 (*Anacortes American* Dec. 17, 1925).

By June of 1928 the owners were planning to enlarge and improve the mill based on a desire to increase its production by one-third (*Anacortes American* June 7, 1928). These modifications included vacating R Avenue from south of 17th Street to the southern end of the company's property. Following the vacancy, the mill sought to expand its plant building and pave the area between the mill and the railway line.

The mill had been operated successfully for a little over 15 years by the Puget Sound Pulp and Timber Company until early September of 1940, when the Coos Bay Pulp Corporation, a subsidiary of Scott Paper Company, purchased it for $425,000 (*Anacortes American*, Sept. 12, 1940). The sale of the mill, which employed more than 80 workers, was regarded as a positive change for the community of Anacortes. The mill's operation would change from its previous use as a buffer mill, which took up slack in production and filled surplus orders from other mills: the mill would start operating continuously, without long shut-downs. In 1947, the Coos Bay Pulp Corporation, Anacortes Division (Scott Paper Co.) signed a formal agreement to purchase the Morrison Mill (*Anacortes American* Aug. 14, 1947), allowing the business to add steam and lumber processing and control the complete production process "from forest to pulp."

By late January of 1962, Scott Paper was celebrating a successful decade of its Puget Sound operations (*Anacortes Reporter* Jan. 25, 1962). More than 130 persons were employed at the plant that had enjoyed ongoing commercial success. The January 25th article also details ongoing efforts to improve the plant's effect on the waters of the Puget Sound, both through procedural changes and as part of an ongoing public relations campaign. A relationship between the mill and the City, once realized through the mutual benefits of industrial and urban growth, had deteriorated as government agencies and the public became more concerned about pollution. During the late 1950s and early 1960s, new environmental regulations and public awareness had encouraged Scott Paper's subsidiaries in Anacortes to invest considerable sums into the environmentally compliant retrofitting of its pulp mill. Scott Paper maintained that it had already invested $5,000,000 on improvements meant to improve the plant's overall effect on water quality by 1967 (*Anacortes American* Nov. 21, 1967).

The geography and hydrology of the Cap Sante/Puget Sound vicinity, which had produced such beneficial conditions for the operation of a pulp mill, had now become a detriment as public and agency awareness of the mill's effect on the environment grew. Besides the problems of deepwater effluents, the mill also produced considerable airborne pollutants that were increasingly being seen as a nuisance to the surrounding community. The problem, referred to as "fallout" by the community, was a rain of cinders that fell on the surrounding area as a result of the pulp production (*Anacortes American* Oct. 3, 1968). The installation of a centrifugal separator alleviated much of the "fallout" problem.

In 1968 Scott Paper spent more than $550,000 on plant retrofitting in an attempt to address environmental and fiduciary concerns. Many of the less efficient and labor-intensive processes at the plant were automated, and the number of employees decreased from 126 to 40. For sample, the plant discontinued the use of its wood fuel by-products or "hogged fuel," which had been stoked into furnaces by a crew of 11, replacing this system with natural gas to reduce air pollutants and to save wage-related expenses. A 3,000-cubic-foot chip surge bin was installed to allow pulp materials to be processed more efficiently. The company also moved much of the final pulp processing to its Everett plant and installed a 30-ton chipper (*Anacortes American* Oct. 3, 1968).

During the 1970s the Scott Paper Company continued to improve the mill, spending millions of dollars to keep up with increasingly strict environmental air and water regulations, while still remaining commercially viable. The company spent $65,000 on an air pollution control project to reduce its sulfur dioxide emissions by 50 percent and $100,000 to improve water quality controls in 1972 (*Anacortes American* Sept. 2, 1971; Dec. 7, 1972). The same year, the company and the City became entangled in a lawsuit over the price of the water that the latter had long supplied (*Anacortes American* Feb. 20, 1974). The result was an 83 percent increase in the cost of water that the plant used. Nevertheless, the Scott Paper Company reported an increase in overall profits in 1974 (*Anacortes American*, April 24, 1974).

The mill shut down on March 24th 1978, removing 79 employees and about one million dollars from the community. Most of the employees were transferred to Scott Paper's facility in Everett. The onsite industrial apparatus was transferred to other Scott Paper sites or sold, and the property was put up for sale (*Anacortes American* March 29, 1978). In May of 1978 a 5.29-acre parcel was sold to the Port of Anacortes and by December of 1978 the rest of the mill property was being sold to others (*Anacortes American* Dec. 13, 1978).

5.0 Reported and Anticipated Archaeological Remains

The following sections discuss the background research and its findings including previous cultural resources studies within about one mile (1.6 km) of the Project area along with recorded archaeological sites as well as historical buildings and structures. The section ends with a description of the types of archaeological resources that could be expected in the vicinity of the Project area.

5.1 Previous Cultural Resources Studies

Six cultural resources surveys have been conducted within about one mile (1.6 km) of the Project area (Table 1). With the exception of one study (Gilpin and Thompson 2008), no cultural resources were identified. HRA prepared a report discussing the results of archaeological monitoring of the Cap Sante Marine clean-up project in the fall and winter of 2007 (Gilpin and Thompson 2008). The work recorded one archaeological site (Site 45SK371, a former USACOE bulkhead characterized by pilings and associated features observed in dredged fill soils – this site was not recommended eligible for listing on the National Register of Historic Places (NRHP) [Gilpin 2008]). Although no cultural resources were identified by ICF-Jones & Stokes during survey of a proposed area for replacement of the existing embankment near the Guemes Ferry Dock, the project vicinity was considered to have a moderate probability for archaeological materials due to its proximity to a known site (shell midden site 45SK294) (ICF-Jones & Stokes 2008).

Table 1. Previous Cultural Resources Studies within About 1 Mile (1.6 km) of the Scott Site APE.

Author(s)	Date	Title	Cultural Resource Identified	Eligibility Status*
Robinson, Joan M.	1990	*A Cultural Resources Survey of SR 20: R Avenue Interchange and East Bound On-Ramp, Anacortes, Skagit County, Washington*	None	Not Applicable
Goetz, Linda Naoi, Kara M. Kanaby, and Douglas F. Tingwall	2007	*Cultural Resources Report Cap Sante Marine Interim Action Project, Skagit County, Anacortes, Washington*	None	Not Applicable
Johnson, Sarah E.	2007	*Letter to Stephenie Kramer RE: Monitoring of an Excavation by the City of Anacortes Parks Department*	None	Not Applicable
Thompson, Gail	2008	*Archaeological Monitoring Plan for the Port of Anacortes Pier 1 Redevelopment Project Skagit County, Washington*	None	Not Applicable
ICF-Jones & Stokes	2008	*Cultural Resources Survey Report Anacortes Ferry Dock Embankment Rip-Rap Replacement Project, Skagit County, Washington*	None	Not Applicable
Gilpin, Jennifer, and Gail Thompson	2008	*Archaeological Monitoring at the Port of Anacortes Cap Sante Marine Interim Action Project, City of Anacortes, Skagit County, Washington*	45SK371 – remains of USACE bulkhead dating 1929-1950s	Recommended not eligible†

*National Register of Historic Places and Washington Heritage Register
†Author's Opinion

Four overview studies have been completed within the general vicinity of the Scott site (Table 2). Three of these studies discuss local Coast Salish tribes’ cultural activities and probable associated artifacts and features (Blukis Onat 1987; Easton 1982; Greengo 1983).

Table 2. Overview Studies in the Project Area Vicinity.

Author(s)	Date	Title	Description
Easton, Norman	1982	*Straits Salish Reef-netting and Social Structure: a Test Case in Economic Anthropology*	Discussion of reef-netting as a mode of production and how this would be a critical point for the economic structure of Straits Salish groups
Greengo, Robert E.	1983	*Prehistoric Places on the Southern Northwest Coast*	Several short essays on the distribution of prehistoric sites and the associated cultural affiliations and traditions
Blukis Onat, Astrida R.	1987	*Resource Protection Planning Process Identification of Prehistoric Archaeological Resources in the Northern Puget Sound Study Unit*	Temporal and spatial overview of environmental and cultural factors in the Northern Puget Sound
Shipman, Hugh	1989	*Vertical Land Movements in Coastal Washington: Implications for Relative Sea Level Change*	Analysis of geologic processes, namely plate tectonics, isostatic rebound, subsidence, and uplift, on the shorelines of Washington, with discussion on how changes in sea level can affect old shorelines and archaeological sites

5.2 Expectations for Archaeological Deposits in the Project Area

Although intensive development and filling of the historical shoreline since the 1890s (see Section 4.3) could have destroyed or disturbed prehistoric, historical Native American, and Euro-American archaeological resources, it is possible that the Project area could contain archaeological deposits. The Project's location in the shallow tidelands near the shoreline of Fidalgo Bay suggests that prehistoric archaeological materials associated with occupation, shellfish gathering, fishing, and other activities could be present beneath historical fill. Artifacts could include remains that had been dumped into the shallow intertidal waters of the bay, which may include lithic, bone, and shell artifacts as well as the food and technological materials from plants and animals. Remains deposited in water also could contain preserved wood and plant fiber artifacts. The tideland location of the Project area also could contain the remains of stone or wood fish weir structures. Human remains and burials, which were typically placed in upland areas, would usually not be expected in previously inundated areas such as the Project site.

Artifacts and features also could result from historical activities, which largely would consist of filling the Project area as well as building and use of the saw, lumber, and pulp mill complexes, ca. 1892-1970s (see Section 4.3). The mill complex is well represented in documentary sources and the activities carried out there were common to the region. Unless remains related to Native American, Asian American, or female workers are located, the historic-period archaeological deposits are not anticipated to be important.

6.0 Procedures for Archaeological Monitoring and the Treatment of Archaeological Resources

1. Archaeological monitoring will take place in the Port and MJB Upland Area portions of the Project APE. In the Port Upland Area, monitoring will occur for Project excavations taking place below 5 ft (1.5 m) Below Ground Surface (BGS) west of R Avenue and below 13 ft (4 m) BGS east of R Avenue. In the MJB Upland Area, monitoring will occur for Project excavations taking place below 3 ft (0.9 m) (Thompson et al. 2009:27).
2. The Port will arrange for a professional Archaeologist who meets the Secretary of the Interior's qualifications (36 CFR Part 61; required by the State of Washington in RCW 27.53.030.8). If an archaeologist meeting the qualifications is not available but an experienced archaeologist (e.g., one with five or more years of experience in a variety of archaeological field situations) is available to monitor construction activities, a "Supervisory Plan for Archaeological Monitoring" appears in Appendix A.
3. For those areas requiring monitoring and associated with contaminated soils, the Archaeologist shall be 40-hour Hazardous Work Operations and Emergency Responses (HAZWOPER) certified in accordance with Occupation Health and Safety Administration standards (OSHA 29 CFR, 1910.120).
4. The Port may also consider inviting representatives from the Samish Indian Nation and Swinomish Tribal Community to visit the Project site and/or witness the excavations with the Archaeologist.
5. The Port of Anacortes's construction contractor will brief the Archaeologist on the Health and Safety Plan elements under which the Archaeologist will perform the monitoring. The Archaeologist will provide the proper Personal Protective Equipment (e.g., hard hat, steel-toed shoes, safety glasses) as required by the Project Health and Safety Plan.
6. The Port will inform the affected Tribes about the schedule for construction activities that will receive archaeological monitoring and will invite them to send a representative to view the monitoring, consistent with the Health and Safety Plan requirements.
7. The Port will arrange for the Archaeologist to train the Project Environmental Inspector and Construction Supervisor(s) about the appropriate procedures to follow in the event of encountering archaeological deposits and human remains. Prior to conducting onsite training, the Archaeologist will contact the Corps and the Tribes to ask if they have concerns or information they would like to have included in the training. The Archaeologist will arrange for Tribes to take part in the training upon their request. The training will be held before ground-disturbance activities in the Port and MJB Upland Areas. In each week's Construction Safety Meeting during these ground-disturbance activities, the Environmental Inspector/Construction Supervisor will emphasize the need for vigilance regarding the unanticipated discovery of archaeological deposits and human remains, and the procedures for treating unanticipated discoveries.
8. The Port will inform the construction contractor(s) about the Archaeologist's monitoring work. The Port will also authorize the Archaeologist to stop construction periodically as needed for a closer examination of exposed soils.

9. During construction excavation of appropriate areas, the Archaeologist will examine soils, including excavations and back-dirt piles. Archaeological equipment will include, as appropriate, a shovel, trowel, and screen of 1/4-inch mesh. The Archaeologist will watch for human remains and for prehistoric or historic-period artifacts or features, or for layers/lenses of shell and organically enriched/midden soils that might indicate past human use.

10. The Archaeologist will record the monitoring work as follows: daily activities will be recorded on a Daily Record Form and in a field notebook; and overview photographs of the site, along with detailed photographs of particular construction areas, work in progress, and any cultural materials, will be promptly logged in a field notebook. In addition, the Archaeologist will log in sketches/drawings of particular areas, features, and soil profiles; and construction work that has been monitored will be noted on construction plans of the Project area, as available.

11. At the completion of monitoring, the Archaeologist will prepare a report on the methods and results of the work, illustrated with maps, drawings, and photographs as appropriate. The Port will provide the draft report to the Corps, Tribes, and DAHP for review and comment. Based on the comments, the Archaeologist will provide a final report to the Port, which will file copies with the Corps, Tribes, and DAHP.

7.0 Procedures in the Event of Discovery of Archaeological Remains

1. If the Archaeologist or a member of the construction work force believes that they have encountered prehistoric or important historic-period archaeological materials (including but not limited to remains that had been dumped into the shallow intertidal waters of the bay, which may include lithic, bone, and shell artifacts as well as the food and technological materials from plants and animals; the remains of stone or wood fish weir structures; or historic-period materials that appear to be associated with Chinese, Japanese, Philippine, Native American, and/or female workers), the Archaeologist will direct the onsite Environmental Inspector/Construction Supervisor to stop excavation work in the immediate area. If the Archaeologist is not present at the time of discovery, the Environmental Inspector/Construction Supervisor will be responsible for stopping excavation work and immediately contacting the Archaeologist.

2. If the Archaeologist believes that the discovery is a significant archaeological resource (i.e., intact enough to warrant further investigation and potential testing for National Register of Historic Places [NRHP] eligibility), the Environmental Inspector/Construction Supervisor will take appropriate steps to protect the discovery site by installing a physical barrier (i.e., exclusionary fencing) and prohibiting machinery, other vehicles, and unauthorized individuals from crossing the barrier. If the discovery appears to be potentially eligible for listing in the NRHP, the Archaeologist will immediately inform the Port, which will then immediately contact the Corps, DAHP, the Samish Indian Nation, and the Swinomish Tribal Community. Treatment measures may include mapping, photography, limited probing and sample collection, or other activities as determined by the Corps in consultation with the Port, DAHP, the Samish Indian

Nation, and the Swinomish Tribal Community. The Port will authorize excavation in the area of the discovery after it has been evaluated and treated.

3. If the monitoring of ground-disturbing activities results in the collection of any artifacts or samples, such as an isolated find not associated with a larger archaeological site, the Archaeologist will be responsible for temporary curation of the artifacts (including appropriate, secure storage). In the case of an isolated find, construction excavation will likely not halt for more than the several minutes that the Archaeologist will require for photography and recording details of the location (e.g., depth below the ground surface, sedimentary context) and other pertinent information about the object. Construction excavation may resume in the area when the Archaeologist has notified the Environmental Inspector/Construction Supervisor.
4. When monitoring work has been completed, the Archaeologist will prepare a report discussing the methods and results of the work. The report will be provided to the Port for review. The Port may provide review comments and HRA will complete a final version of the report responding to any comments. The Port will submit the final report to the Corps. The Corps will distribute the report to the DAHP, the Samish Indian Nation, and the Swinomish Tribal community.
5. After monitoring has been completed, consultation among the interested and involved parties will determine the disposition of any artifacts or other cultural material collected.
6. If monitoring reveals human remains, the procedures listed in Section 8 will be followed.

8.0 Procedures in the Event of Discovery of Human Remains

Any human remains that are discovered during construction of the Project will be treated with dignity and respect. The affected Native American Tribes are the Samish and Swinomish Tribes.

1. If the Archaeologist or a member of the construction work force believes that they have discovered human skeletal remains, the Environmental Inspector/Construction Supervisor will be responsible for stopping construction excavation work adjacent to the discovery in an area large enough to provide for the security and integrity of the remains as determined between the Archaeologist and the Environmental Inspector/Construction Supervisor.
2. If the discovery of possible human remains occurs during archaeological monitoring, the Archaeologist or his/her supervisor will be responsible for preliminary examination to determine whether the remains are human. If they are unable to determine if the remains are human, the Archaeologist or his/her supervisory will take appropriate steps to contact an individual who can provide definitive identification. If the remains are human, the Environmental Inspector/Construction Supervisor will be responsible for taking appropriate steps to protect the remains by installing a physical barrier (i.e., exclusionary fencing) and prohibiting machinery, other vehicles, and unauthorized individuals from crossing the barrier into affected areas. Following work stoppage, the Archaeologist will immediately notify the Port, the Corps, the Skagit County Sheriff's Office, the Skagit

County Medical Examiner's Office, the DAHP, and the affected Tribes (see Appendix B, Contacts).

3. If the discovery of possible human remains occurs when there is no Archaeologist on-site, the Environmental Inspector/Construction Supervisor will immediately notify the Port, who will then notify the Archaeologist and the others listed in Paragraph 1 above.

4. The Skagit County Sheriff and the Skagit County Medical Examiner's (ME) Office will determine whether the remains should be treated as forensic or non-forensic remains. The Archaeologist will remind the Sheriff and the ME that the find may be a prehistoric or historic-period burial, that the find must be treated confidentially to prevent vandalism, and that the affected Tribes are concerned about Native American burials. The Port will promptly notify the Corps and the affected Tribes of the Sheriff's and ME's decision.

5. If the ME determines the remains to be non-forensic, they will notify DAHP within two business days of that determination. The State Physical Anthropologist at the DAHP will then have two business days to notify the Port and the affected Tribes of the ME's decisions and to make a determination as to whether the remains are Native American. The Port will consult with the Tribes and the Corps to determine what treatment is appropriate for the remains.

6. Exposed Native American human remains and any associated or non-associated funerary objects will be treated with dignity and respect. Prior to ultimate disposition, the remains and/or funerary objects will be temporarily re-buried or protected in other ways in accordance with the wishes of the affected Tribes. No additional excavation of these remains and/or funerary objects will take place without Corps authorization, and no exposed remains or funerary objects will be left unattended in the field unless otherwise directed by the Corps.

7. The Port will make a good faith effort to accommodate requests from the Tribes that they be present during the implementation of mitigation measures related to human remains.

8. Ground disturbance activities within the discovery area and the buffer will not resume until the Port and the Corps, in consultation with the DAHP and affected Tribes (and the Medical Examiner, if applicable), have determined proper disposition of the remains and has given permission, in writing, to proceed.

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HRA
HISTORICAL RESEARCH ASSOCIATES, INC.

Appendix A

Example Supervisory Plan for Archaeological Monitoring

Supervisory Plan for Archaeological Monitoring

Port of Anacortes Former Scott Paper Mill Site

Project: **Former Scott Paper Mill Cleanup Project, #ENV-01**

Location: **Anacortes, Skagit County, Washington**

Monitoring Plan:	Attachment A (not included herein)
Name of Archaeological Monitor:	Name
Monitor's Resume	Attachment B (not included herein)

Summary of Monitor's Qualifications:

• At least 5 years of archaeological field experience:	☒ Yes ☐ No
• Experience in archaeological excavation:	☒ Yes ☐ No
• Experience with historical and prehistoric archaeological artifacts and deposits that could be found at the monitoring location:	☒ Yes ☐ No
• Experience in archaeological monitoring: (or an HRA onsite supervisor will be present during first monitoring project)	☒ Yes ☐ No

Professional Archaeologist(s) who will serve as Monitoring Supervisor(s):

Name, Degree	Position
Gail Thompson, Ph.D.	HRA Senior Associate Archaeologist
Jennifer Gilpin, M.A.	HRA Research Archaeologist
Derek Shaw, M.A.	HRA Research Archaeologist
Shari Silverman, M.A.	HRA Project Archaeologist

Supervisory Requirements:

- Monitor will have a cell phone and a digital camera.
- Supervisor will visit the project site at the beginning of the work, if the monitor has not worked at the location previously. Supervisor will visit the project site periodically if the monitoring work continues longer than two full-time weeks. Supervisor will visit the project site if a find is made that needs immediate attention.
- Monitor will record daily notes on HRA's standard monitoring form (Attachment C). Monitor will take at least one photograph daily to record the work progress.
- Monitor will telephone Monitoring Supervisor daily to describe construction work, monitoring methods, and findings, and to discuss any questions.
- Monitor will send electronic photographs of any finds of artifacts or deposits to supervisor for discussion of treatment measures and decisions. The Supervisor will be available to visit site on short notice to view finds that are questionable and/or need immediate attention.
- Monitor will submit written notes weekly for Supervisor's review.

- Supervisor will review written notes at least weekly and during site visits, and will sign each monitoring record form.

Appendix B
List of Contacts

List of Contacts

City of Anacortes Police Department (APD)

Bonnie Bowers, Chief of Police
360-293-4684

Skagit County Coroner

Daniel Dempsey
360-336-9431

Archaeological Consultant

Historical Research Associates, Inc. (HRA).
Gail Thompson
206-343-0226 (Ext. 15)
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Port of Anacortes

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APPENDIX F
ECOLOGY WATER QUALITY REQUIREMENTS

Former Scott Paper Mill
Ecology Water Quality Requirements
Appendix F

A. Water Quality:

A1. In-Water Construction Water Quality Sampling and Monitoring: A Water Quality Protection and Monitoring Plan (Plan) shall be developed and implemented. "In-water construction" is defined as all work below the ordinary high water mark of Fidalgo Bay.

The Applicant shall submit the Plan for Ecology review and approval at least 20 days prior to the start of in-water work.

The Plan shall include the following minimum requirements:

a. Locations of samples: Locations of water quality sampling sites shall be identified and described in the Plan and on a map of the project area. At a minimum, sampling shall take place at the point of compliance as specified in WAC 173-201A-210(1)(e)(i), which allows a 150-foot temporary area of mixing for turbidity resulting from disturbance of in-place sediments in Fidalgo Bay, and a 100-foot warning point. Background samples shall be collected outside the area of influence of the in-water work. Background samples shall be collected at the same frequency as the point of compliance samples.

   Turbidity shall be monitored at 3 depths. Samples shall not be averaged across depth.

b. Number of samples: Number and frequency of water quality samples to be taken.

c. Parameter to be sampled: Turbidity and petroleum sheen shall be sampled for this project.

d. Equipment: Sampling for turbidity is to be accomplished using a turbidometer properly calibrated according to the operator's manual. Sheen will be noted via ongoing visual inspection.

e. Best Management Practices (BMPs): A description of the BMPs that will be used during construction to protect water quality.

f. Early warning detection: If turbidity at the 100-foot warning point reaches 5 NTU over background, or greater than 10% over background, the activity shall be altered in order to prevent an exceedance at the 150-foot point of compliance. If sheen is observed, absorbent pads, booms and other containment devices will be employed. Modification of dredge rate will be adjusted to allow containment of sheen.

g. Detection of exceedances: Water quality standards for turbidity in "Extraordinary" waters are as follows: turbidity shall not exceed 5 NTU over background conditions when the background is 50 NTU or less, or a 10 percent increase in turbidity when the background turbidity is more than 50 NTU. Water quality parameter for sheen is considered any noticeable persistent surface sheen. If exceedances of these standards at the point of compliance specified in WAC 173-201A-210(1)(e)(i) is detected through water quality sampling and monitoring, the Applicant shall immediately take action to stop, contain, and prevent unauthorized discharges or otherwise stop the violation and correct the problem. After such an event, the Applicant shall assess the efficacy of the site BMPs and update or improve the BMPs used at the work site in an effort to reduce or prevent recurrence of the turbidity and sheen exceedances.

h. <u>Reporting</u>: If no exceedances are detected, results of water quality sampling, as determined by the Plan, shall be forwarded to Ecology on a monthly basis.

i. <u>Notification of exceedances</u>: Notification of exceedances that are detected through water quality sampling and inspection shall be made to Ecology within 24 hours of occurrence. Notification shall be made with reference to Consent Decree #09-01247-7, Attn: Sandra Caldwell, by telephone at (360) 407-7209 or (360) 481-9200, or by fax to (360) 407-7154. The Applicant shall, at a minimum, provide Ecology with the following information:

    i. A description of the nature and cause of exceedance.

    ii. The period of non-compliance, including exact dates, duration, and times and/or the anticipated time when the Applicant will return to compliance.

    iii. The steps taken, or to be taken, to reduce, eliminate, and prevent recurrence of the non-compliance.

    iv. In addition, within five (5) days after notification of an exceedance, the Applicant shall submit a written report to Ecology that describes the nature of the exceedance, turbidity results and location, photographs, and any other pertinent information.

B. Construction Activities:

General:

B1. Construction stormwater, sediment, and erosion control best management practices (BMPs; *e.g.*, filter fences, etc.) suitable to prevent exceedances of state water quality standards shall be in place before starting construction at the site.

B2. Sediment and erosion control measures shall be inspected and maintained prior to and during project implementation.

B3. All construction debris shall be properly disposed of on land so that it cannot enter a waterway or cause water quality degradation to state waters.

B4. Machinery and equipment used during construction shall be serviced, fueled, and maintained upland, unless otherwise approved by Ecology, in order to prevent contamination to any surface water.

B5. Wash water containing oils, grease, or other hazardous materials resulting from wash down of equipment or working areas shall be contained for proper disposal, and shall not be discharged into state waters or storm drains.

B6. Clean Fill Criteria: Applicant shall ensure that fill (soil and sand) placed for the proposed project does not contain toxic materials in toxic amounts.

B7. If cast in place, wet concrete/grout shall be prevented from entering waters of the state. Forms for any concrete/grout structure shall be constructed to prevent leaching of wet concrete/grout. Impervious materials shall be placed over any exposed concrete/grout not lined with the forms that will come in contact with state waters. Forms and impervious materials shall remain in place until the concrete/grout is cured.

B8. Work in or near the water that may affect fish migration, spawning, or rearing shall cease immediately upon a determination by Ecology or WDFW that fisheries resources may be adversely affected.

Work in Marine Waters:

B9. During project demolition or construction, a containment boom incorporating silt curtains and absorbent pads shall be placed around the perimeter of the work area to capture wood debris and other materials released into the waters as a result of construction activities. All accumulated debris shall be collected and disposed of upland at an approved disposal site.

B10. The Applicant shall use tarps or other containment method when cutting or drilling over water to prevent debris, sawdust, concrete and asphalt rubble, and other materials from entering the water.

B11. During construction, the Applicant shall have a boat available on site at all times to retrieve debris from the water.

B12. All manmade debris that has been deposited below the Ordinary High Water Line within the construction work area shall be removed and disposed of upland such that it does not enter waters of the state. Concrete rubble, wood debris, metal debris, and other debris in the construction work corridor that have washed into marine areas shall be removed from the project area.

B13. Project activities shall be conducted to minimize siltation of the beach area and bed.

B14. The Applicant shall operate the barge(s) and tug in deep water so as to minimize nearshore propeller wash impacts such as suspension of nearshore sediments.

B15. Barges shall not be allowed to ground-out during construction.

B16. Intertidal work, including excavation, backfilling, and fill placement shall be completed in the dry whenever possible. Nearshore work will also require boom and silt curtain containment when accessed from either the shoreward or waterward side.

B17. Short-term impacts to water quality shall be minimized during shoreline stabilization by careful placement of geotextile fabric, crushed rock, bedding and armor rock.

Piling Removal:

B18. Approximately 1,030 existing timber piles shall be removed from marine waters. All piling shall be removed by vibratory extraction. In the event these pilings break off during extraction, the remaining piling shall be cut at the mudline.

B19. Piles, stubs, debris, and all associated excavated sediments shall be contained and prevented from entering waters of the state.

B20. Piles removed from substrate: the pile shall be moved immediately from the water into the barge or onto uplands. The pile shall not be shaken, hosed-off, left hanging to drip or any other action intended to clean or remove adhering material from the pile.

B21. Work surface on the barge deck or on uplands shall include a containment basin for piles and any sediment removed during pulling of the piling. Basins may be constructed of durable plastic sheeting with sidewalls supported by hay bales or support structure to contain all sediment.

B22. The piles and any sediment removed during pulling of the piling shall be disposed of at an approved upland disposal site.

Piling Driving:

B23. The new pilings shall be steel.

B25. The steel pilings shall be installed using a vibratory hammer whenever possible. An impact hammer may be used to proof pile, if needed.

B26. If an impact hammer is used, a block of wood at least six (6) inches thick shall be placed between the impact pile driver and the pile, or a bubble curtain shall be employed, to minimize in-water noise during installation of steel piles 10 inches in diameter or less. The Applicant shall employ a bubble curtain during installation of steel piles greater than 10 inches in diameter when using an impact hammer. The bubble curtain shall be deployed in a manner to ensure that bubbles completely engulf the piles during the impact driving. If any fish are seen to be in distress, work shall immediately cease and a bubble curtain shall be deployed before the driving is completed.

C. Project Mitigation:

C1. Impacts to aquatic resources shall be mitigated by creating substrate modification for eelgrass in the intertidal/shallow subtidal area, eelgrass planting, and riparian planting. Except as modified by this Order, mitigation measures are described in the following document: *Former Scott Paper Mill Clean-Up Project Mitigation and Monitoring Plan* (hereafter referred to as the "Mitigation Plan"), prepared by Grette Associates, dated 2/27/09.

C2. In addition to conditions in the above-referenced document, the following requirements shall be conditions of this Order:

a. Timing: Site preparation and installation of compensatory mitigation must begin at the first opportunity after construction affecting mitigation areas is complete, and in no case later than

   i. June 15, 2011, for the substrate modification for eelgrass in the intertidal/shallow subtidal area and eelgrass transplanting.
   ii. April 30, 2011 for the riparian planting.

   Mitigation actions must be completed before the start of the seasonal closure period for in-water work. The closure period begins on March 15 and continues through June 14.

b. Field Supervision: Riparian plant and eelgrass installation shall be field-supervised by a qualified consultant to ensure that plants are healthy, meet specifications, and are appropriately placed.

c. As-Built Report (Year 0): A report documenting the topographic contours and riparian plants and eelgrass installed in the mitigation areas must be prepared when site construction and planting are completed. The report shall include the following:

   i. Vicinity map showing site access.
   ii. Drawings that show the bathymetry of the substrate modification for eelgrass in the intertidal/shallow subtidal area in relation to Mean Lower Low Water (MLLW)
   iii. Drawings that clearly identify in plan view the location and square footage of the planted area.
   iv. The installed planting scheme showing approximate locations of plants and the time of planting.
   v. Photographs of planting areas taken from permanent reference points.
   vi. Locations of photopoints, and sampling sites.
   vii. A description of any changes to the mitigation plan that occurred during construction.

   Two copies of the as-built report shall be sent to Sandra Caldwell, within 60 days of completing installation of the mitigation measures, and in no case later than July 31, 2011.

d. Monitoring: The eelgrass monitoring shall be documented in years 1, 2, 4, and 10, as described in the Mitigation Plan.

e. Performance Standards: The project shall meet the performance standards as described in the Mitigation Plan. If the performance standards for eelgrass survival do not meet those outlined in the Monitoring Plan, then a contingency plan for meeting the standards shall be prepared and submitted to Ecology for review and approval.

f. Maintenance: The Applicant is responsible for maintenance and protection of the native vegetation planting area both throughout and after the 10-year monitoring period for riparian plantings. All plants that fail to survive for one (1) year after planting shall be replaced before or at the beginning of the next growing season.

g. Riparian Plantings: Riparian plantings shall consist of species endemic to the Puget Sound Basin. Proposed plantings of *Arbutus marina* shown in the Mitigation Plan and associated drawings shall be replaced with *Arbutus menziesii*.

C3. All habitat material (i.e., gravel) shall be washed prior to placement in waters of the state.

C4. The Applicant shall avoid impacts to eelgrass beds outside the project area during construction. Placement of barge anchors in eelgrass beds outside the project area is prohibited.

C5. Eelgrass beds outside the project area shall not be shaded for a continuous period of longer than four (4) days. Any portion of the eelgrass bed shaded for four (4) consecutive days shall receive, at a minimum, three (3) consecutive days of uninterrupted natural light.

C6. Prior to initiating construction activities, a qualified consultant shall mark the edge of the eelgrass habitat outside of the project area that falls within the barge work corridors with temporary buoys.

Conditions for Dredging Activities:

General Conditions:

D1. All dredging shall be completed with a mechanical clamshell dredge. Use of any other type of dredge will require prior approval from the Dredged Material Management Program (DMMP) agencies and Ecology's Toxic Cleanup Program Sediment Specialist.

D2. Each pass of the dredge bucket shall be complete.

D3. Dredged material designated for open water disposal shall be placed into a split hull (bottom dump) barge for transport by tugboat. The barges shall have sidewalls in order to contain the material within the barge. Barges shall not be overfilled in order to prevent barge overflow.

D4. Dredged material designed for upland disposal shall be placed into a barge with sidewalls to contain the material within the barge. Dewatering shall be controlled using straw bales and filter fabric or other material to reduce particulate flow. Dredge material drainage water will be channeled through a carbon filter bank prior to discharge back into the surrounding water.

D5. For dredge material designated for open water disposal, all debris (larger than 2 feet in any dimension) shall be removed from the dredged sediment prior to disposal. Similar sized debris found floating in the dredging or disposal area shall also be removed. This debris shall be disposed of upland such that it does not enter waters of the state.

D6. Dredging operations shall be conducted in a manner that minimizes the disturbance or siltation of adjacent waters and prevents the accidental discharge of petroleum products, chemicals, or other toxic or deleterious substances into waters of the state.

D7. The Applicant shall provide two (2) copies each of the "Dredging and Disposal Workplan" to Ecology for review and approval. The workplans shall be submitted to Ecology at least seven (7) days prior to the start of dredging. The workplans shall identify methods, procedures, and equipment that will be used and describe how water quality impacts will be minimized during dredging and in-water disposal activities. Notification information also shall be included in these workplans.

D8. The Applicant shall notify Ecology within seven (7) days of completing each stage of dredging.

F. Long-Term Project Monitoring of Sediment Cap:

F1. Monitoring of the sediment cap, to document acreage and changes in the elevation of the site shall be conducted per the *Former Scott Paper Mill Clean-Up Project Mitigation and Monitoring Plan* (hereafter referred to as the "Monitoring Plan"), dated February 27, 2009, prepared by Grette Associates, LLC, except as modified by this Order.

Monitoring will include the following:

a. As-Built Survey Report and Drawings: A report documenting the final constructed configuration of the sediment cap shall be prepared when site construction is completed. The report shall include a topographic/bathymetric survey of the site at a resolution sufficient to detect changes to the elevation and/or thickness of the sediment cap. The survey shall extend across the upper intertidal to the upland edge, and far enough offshore and alongshore to cover all areas directly impacted by the project or identified as potential mitigation areas for eelgrass or substrate.

Two copies of the As-Built Survey Report shall be sent to Ecology per Condition A2 within 60 days of completing construction, and in no case later than August 30 2011 unless approval is obtained in advance from Ecology. The project monitoring period shall commence with Ecology's acceptance of the As-Built Survey Report.

b. Monitoring: Monitoring to ensure that the project performance standards are met shall be performed as described in the Monitoring Plan over a period of ten (10) years. Monitoring reports shall include a topographic/bathymetric survey of the site at a resolution sufficient to detect changes to the elevation and/or thickness of the sediment cap. The survey shall extend across the upper intertidal to the upland edge, and far enough offshore and alongshore to cover all areas directly impacted by the project or identified as potential mitigation areas for eelgrass or substrate. The elevation surveys shall include descriptions of sediment size.

Two (2) copies of all monitoring reports shall be submitted to Ecology per Condition A2.

F2. If the thickness of the cap decreases below the 2.75 feet stated in the plans, the Port shall notify Ecology immediately.

G. Emergency/Contingency Measures:

G1. The Applicant shall develop and implement a Spill Prevention and Containment Plan for all aspects of this project.

G2. The Applicant shall have adequate and appropriate spill response materials on hand to respond to emergency release of petroleum products or any other material into waters of the state.

G3. Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., shall be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills into state waters.

G4. Any work that is out of compliance with these provisions, or conditions causing distressed or dying fish, or any discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, is prohibited. If these occur, the Applicant shall immediately take the following actions:

a. Cease operations at the location of the violation or spill.

b. Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage.

c. <u>Notify Ecology of the failure to comply</u>. All oil spills shall be reported immediately to Ecology's 24-Hour Spill Response Team at 1-800-258-5990, **and** within 24 hours of spills or other events to Pete Adolphson at 360-407-7557.

d. Submit a detailed written report to Ecology within five (5) days that describes the nature of the event, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.

APPENDIX G

HYDRAULIC PROJECT APPROVAL SUBSTANTIVE REQUIREMENTS

State of Washington
Department of Fish and Wildlife
Mailing Address: P.O. Box 1100, La Conner, WA 98257
Main Office Location: 111 Sherman Street, La Conner, WA 98257

RECEIVED
JUL 09 2009
DEPT OF ECOLOGY
Toxics Cleanup Program

July 6, 2009

Sandra Caldwell - Site Manager
WA Department of Ecology
Toxics Cleanup Program
P.O. Box 47600
Olympia, WA 98504-7600

Dear Site Manager:

SUBJECT: Comments Proposed Scott Paper Mill Cleanup Action, Fidalgo Bay

Although RCW 70.105D.090 indicates that remedial actions conducted under the Model Toxics Control Act are exempt from procedural requirements for specified state environmental permits and local government permits, the department (Ecology) shall ensure compliance with the substantive provisions of chapter 77.55 (formerly 75.20) RCW. Applicable conditions of the Hydraulic Project Approval authority (RCW 77.55 WAC 220-110) administered by the Washington Department of Fish and Wildlife (WDFW) meet these criteria. The following conditions are applicable substantive requirements of the Hydraulic Code as administered by WDFW for the protection of fish life in Washington State, and as such, are applicable to remedial actions conducted at the Scott Paper Mill cleanup site in Fidalgo Bay.

The WDFW has reviewed the Joint Aquatic Resources Permit Application (JARPA) form, entitled Former Scott Paper Mill Cleanup Action, dated February 18, 2009. Marine components of this project include demolition, cleanup dredging, construction of rock wave attenuation structures, post dredging grade restoration and sediment capping, pile breakwater demolition, shoreline stabilization, and construction of a new public access pier and float. WDFW considers all of these activities to be part of the cleanup action except for construction of the new public access pier and float, which will require separate agency review and permitting. In addition, the delineated navigation channel offshore of the wave attenuators, which bisects the proposed eelgrass mitigation area, is not authorized or otherwise permitted through this response letter.

WDFW offers the following comments concerning the Scott Paper Mill Cleanup Action and asks that they be accepted a part of the state coordinated response.

<u>Demolition</u>

Several structures are to be removed from within the marine cleanup action area of this project. These structures include the small craft launch facility adjacent to the Seafarers' Park shoreline consisting of a 12 foot wide by 200 foot long floating dock and 10 creosote treated timber moorage piles; approximately 600 creosote stub timber piles from within the intertidal area; the existing riprap armor rock along the Seafarers' Park shoreline; and the creosote timber pile breakwater consisting of approximately 480 timber piles at the south entrance to Cap Sante Marina. The following comments shall apply to demolition aspects of this project:

- All manmade debris on the beach shall be removed and disposed of upland such that it does not enter waters of the state.
- The existing float structure to be replaced shall be removed and disposed of at an approved site, unless relocation within waters of the state is authorized under a separate HPA.
- Piling removed shall be fully extracted and disposed upland such that they do not enter waters of the state.
- Project activities shall be conducted to minimize siltation of the beach area and bed.
- All debris or deleterious materials resulting from construction shall be removed from the beach area and bed and prevented from entering waters of the state.
- No petroleum products or other deleterious material shall enter surface eaters.
- Project activities shall not degrade water quality to the detriment of fish life.

<u>Cleanup Dredging</u>
The project will dredge up to 55,000 cubic yards (cy) of sediment and wood debris to remove contaminated material across the entire marine area of the site. The following comments shall apply to cleanup dredging aspects of this project:

- The area of cleanup dredging shall be restricted to the area shown on sheet 5 of 16, entitled Marine Area Excavation and Dredge Plan, dated February 18, 2009.
- Work below the ordinary high water mark shall not occur from March 15 through June 14 of any year for the protection of migrating juvenile salmonids.
- Work below the ordinary high water line shall not occur from January 15 through March 31of any year for the protection of herring spawning beds.
- Dredging projects shall incorporate mitigation measures as necessary to achieve no-net-loss of productive capacity of fish and shellfish habitat.
- If a hydraulic dredge is used, it shall only be operated with the intake at or below the surface of the material being removed. The intake shall only be raised a maximum of three feet above the bed for brief periods of purging or flushing the intake system.
- If a clamshell dredge is used, each pass of the dredge bucket shall be complete.
- Dredged material shall not be stockpiled below the ordinary high water line.
- Dredge material shall not be utilized for project construction or fills.
- Dredged materials shall be disposed at an approved upland or open water disposal site.
- The 10 existing timber moorage piles and approximately 600 creosote stub piles shall be removed completely and disposed of upland so such that they do not enter waters of the state.
- Eelgrass and kelp in areas adjacent to the dredge footprint shall not be adversely impacted due to any project activities (e.g., barge shall not ground, equipment shall not operate, and other project activities shall not occur in eelgrass and kelp).

- Eelgrass adversely impacted due to dredging shall be replaced using proven methodology.
- Project activities shall be conducted to minimize siltation of the beach area and bed.
- A containment boom and silt curtain shall be deployed around the active dredge site.
- All debris or deleterious material resulting from construction shall be removed from the beach area and bed and prevented from entering waters of the state.
- Project activities shall not degrade water quality to the detriment of fish life.
- If at any time, as a result of project activities, fish are observed in distress, a fish kill occurs, or water quality problems develop (including equipment leaks or spills), immediate notification shall be made to the Washington Military Department's Emergency Management Division at 1-800-258-5990, and to the Area Habitat Biologist listed below.

Construction of Rock Wave Attenuation Structures

Two rock wave attenuation structures are proposed to be constructed offshore to reduce wave energy and shoreline erosion along Seafarers' Park shoreline. The following comments shall apply to construction of the rock wave attenuators for this project:

- The wave attenuators shall be located as shown on sheet 7 of 16, entitled PROPOSED SITE PLAN (Marine Structures), and dated February 18, 2009.
- Base rocks shall be buried a minimum of 18 inches below the pre-project natural beach grade.
- Rock shall be composed of clean, angular material of a sufficient durability and size to prevent its being broken up or washed away by high water or wave action.
- The landward face of each wave attenuator below + 8.2 feet MLLW (MLLW = 0.0 feet tidal elevation) shall be capped with fine sediments to fill the interstitial spaces of the wave attenuators.
- Capping material shall consist of combination of sand and clean round 'pea gravel', not crushed. At least 80 percent of the gravel shall be sized between 1/16 inch and 1/4 inch in diameter.
- The Port of Anacortes (POA) shall monitor the cap material and maintain the layer as necessary to ensure the rock interstices on the landward face remain filled.

Restore Grades and Place Sediment Cap

Marine and shoreline capping material will be placed across the areas of dredging and shoreline excavation to restore the original grades. The following comments shall apply to grade restoration and sediment capping for this project:

- Capping shall be as shown on sheet 6 of 16, entitled CAP AND BACKFILL PLAN, and dated February 18, 2009.
- Source of materials for capping may include the beneficial reuse of clean dredged sediments from the Swinomish Channel or Port of Curtis Wharf.
- Capping layer shall consist of an approximately 2.75 foot thick graded mix of material ranging in size from sand to cobble.
- Cap shall be designed to maintain a thickness of 2 feet during an extreme wave event of 50 year recurrence interval.

- Areas of lower elevation below -2 feet MLLW shall covered with fine sediments suitable for the establishment of eelgrass. This are shall consist of 2.9 acres landward of the proposed wave attenuators and 4.0 acres east of the wave attenuators (see Project Mitigation).
- Cap material shall be spread by barge using a clam shell bucket or front end loader.
- Cap layers shall be placed as evenly as possible to achieve a uniform coverage and depth of sediment caps.
- Depressions or non-uniform cap areas shall be re-graded to project specified grades upon project completion.

Shoreline Stabilization
Block retaining step walls will be installed along portions of the POA shoreline where the excavation of contaminated upland soil has resulted in elevation differences between the upland area and marine area. Shoreline capping consisting armor rock and quarry spalls is required along the section of shoreline owned by MJB Properties, Inc. that will not be protected by the wave attenuation structures. The following comments shall apply to shoreline stabilization aspects of this project:

- Armor rock and step walls shall follow the contour of the existing natural bankline as shown on sheet 7 of 16, entitled PROPOSED SITE PLAN, and dated February 18, 2009.
- Armor rock wall along the MJB Property shoreline shall be installed landward of MHHW as shown on sheet 7 of 16, entitled PROPOSED SITE PLAN, and sheet 9 of 16, entitled SECTION, both dated February 18, 2008.
- Step walls shall be placed landward of +11 feet MLLW as shown on sheets 10 and 11 of 16, entitled SECTIONS, and dated February 18, 2009.
- Step walls installed along the POA shoreline shall be installed at elevations relative to the estimated finished beach profile as shown on sheet 13 of 16, entitled BLOCK WALL DETAILS, and dated February 18, 2009.
- At any point along the step wall facing the POA property and the armor rock wall along the MJB Property shorelines, the height of the structures shall be no greater than six feet above beach grade
- All natural habitat features on the beach larger than 12 inches in diameter, including trees, stumps, logs, and large rocks, shall be retained on the beach following construction of the armor rock and step retaining walls. These habitat features may be moved during construction if necessary.

Creosote Timber Pile Breakwater
The existing creosote timber pile breakwater and rock toe shall be removed after construction of the new rock wave attenuators as part of mitigation for these structures. The following comments shall apply to this component of the project:

- The approximately 430 existing creosote timber piles that make up the south breakwater at the entrance to Cap Sante Marina shall be removed completely and disposed of upland so such that they do not enter waters of the state.
- One lighted navigational aid pile and three day marker piles will be placed within the footprint of the creosote pile breakwater. One additional lighted navigational aid pile and

one day marker pile will be placed on the new rock wave attenuators as shown on sheet 7 of 16, entitled PROPSED SITE PLAN, and dated February 18, 2009.

- New steel piles shall be driven by means of a vibratory hammer.
- In the event that an impact hammer is required for driving or final proofing, the following sound attenuation methods shall be required:
  a. For steel piles, 10 inches in diameter or less, a 6 inch thick wood block shall be installed between the piling and the impact hammer during pile driving operations or a bubble curtain shall be installed around the pile during pile driving operations.
  b. For steel piles greater than 10 inches in diameter, a bubble curtain shall be installed around the pile during pile driving operations.
- Eelgrass and kelp in areas adjacent to the pile driving operation shall not be adversely impacted due to any project activities (e.g., barge shall not ground, equipment shall not operate, and other project activities shall not occur in eelgrass and kelp).

Project Mitigation

The project will impact surf smelt spawning beaches and documented herring spawning eelgrass habitat. WAC 220-110-250 lists such habitats as Saltwater Habitats of Special Concern and for this reason appropriate mitigation will be required to offset unavoidable project impacts. Per WDFW mitigation policy (POL-M5002), the goal for habitat mitigation is to achieve no loss of habitat functions and values. In the long-term, WDFW seeks a net gain in productive capacity of habitat at the Scott Paper Mill site through restoration, creation, and enhancement. Surf smelt spawning habitat and herring spawning eelgrass habitat will need to be restored and enhanced to levels above those that existed prior to the start of the project. To this end, the project shall conform to all of the mitigation specifications, including the functional objectives and performance standards for the project as outlined in Section 8.2, of the Mitigation and Monitoring Plan prepared for this project by Grette and Associates, LLC, and dated March 2, 2009. These objectives and performance standards are:

- To mitigate for direct impacts to eelgrass at a ratio of 2:1 with respect to area and total shoot count. This will result in a minimum of 2.90-acres of eelgrass on the inside of the proposed rock wave attenuators with a minimum of 180,000 eelgrass turions.
- To create a minimum of 300 linear feet of suitable substrate (sand and gravel) for surf smelt spawning between +5 and +9 feet MLLW.
- To create suitable habitat, consisting of a fine substrate overlay, for epibenthic crustaceans on the landward side of the rock wave attenuators below +8.2 feet MLLW.

To ensure the mitigation goals and performance standards are reached, the mitigation sites will need to be carefully monitored with built in benchmarks and a contingency plan implemented in the event that benchmarks are not reached. The monitoring plan shall be followed as described in Monitoring Activities, Section 8.3, pages 50-53, of the Mitigation and Monitoring Plan prepared for this project by Grette and Associates, LLC, and dated March 2, 2009. In addition to the above mitigation requirements the project shall conform to the Aquatic/Marine Construction BMPs listed in Section 9.2, pages 57-58, of the Mitigation and Monitoring Plan prepared for this project by Grette and Associates, LLC, and dated March 2, 2009.

Reporting Requirement

The POA shall submit to the WDFW Habitat Biologist list below, a report for each year that monitoring activities occur, of all project cleanup and monitoring activities performed as required for this project. The reporting schedule shall be as described under Section 8.4.3, pages 54-55, of the Mitigation and Monitoring Plan prepared for this project by Grette and Associates, LLC, and dated March 2, 2009. At any time if problems are experienced in meeting mitigation goals and performance standards, either the POA or WDFW may request a joint agency review meeting. The annual report shall include:

- An As-Built Survey to confirm the fine substrate overlays on the landward side of the wave attenuators are complete and that suitable area for surf smelt spawning exist along 300 feet of shoreline between +5 and +9 feet MLLW: Post-Construction Surveys; and Photographic Documentation.
- Biological Surveys of eelgrass transplant plots and any volunteer eelgrass recruitment.
- List of individual projects completed and any problems encountered: Covering all phases of the project - demolition, cleanup dredging, construction of rock wave attenuation structures, post dredging grade restoration and sediment capping, pile breakwater demolition, and shoreline stabilization.
- Comparison of mitigation performance in relation to performance standards in the mitigation plan and contingency action measures proposed if performance standards have not been met.
- Recommendations for improvement to BMPs and mitigation.

Thank you for the opportunity to provide these comments. If you have any questions regarding these comments please contact me at 360-466-4345 ext. 251.

Sincerely

Douglas S. Thompson
Habitat Program

DST:dst

cc: Brendan Brokes, WDFW
Randy Carman, WDFW
Peter Birch, WDFW

APPENDIX H

CONSTRUCTION STORMWATER GENERAL PERMIT

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

4 May 2009

Becky Darden
Port of Anacortes
P.O. Box 297
Anacortes, WA 98221

Dear Ms. Darden:

RE: Construction Stormwater General Permit
Permit Number: **WAR-011650**

Site Name:	Former Scott Paper Mill Cleanup	
Location:	20th St & Q Ave	
	Anacortes, WA	Skagit Co.
Disturbed Acres:	16.0	
Receiving Water:	Fidalgo Bay	

The Washington Department of Ecology (Ecology) has reviewed your application for coverage under the Construction Stormwater General Permit, and has decided to issue permit coverage effective 5/04/2009. **Please retain this permit coverage letter with your permit (enclosed), stormwater pollution prevention plan (SWPPP), and site log book. These form the official record of permit coverage for your site.**

This letter explains some of the requirements in the permit. Please take time to read the permit, and contact Ecology if you have any questions.

Inspections (Special Condition S4, pages 10-12 for additional information)

- A Certified Erosion and Sediment Control Lead (CESCL) must conduct weekly inspections of your site to ensure that you have installed and properly maintained the appropriate best management practices (BMPs).
- Ecology's website has a list of training classes to obtain CESCL certification on its website: http://www.ecy.wa.gov/programs/wq/stormwater/cescl.htm.
- You must keep the inspection results in your site log book and make them available for Ecology or the local jurisdiction to review. You may use the enclosed inspection report template. You must keep these results in your site log book.

Sampling and Analysis (Special Condition S4, pages 10-15 for additional information)

- Permittees must sample stormwater and non-stormwater discharges for turbidity using a turbidity meter.

- Permittees must sample all locations where stormwater or non-stormwater (dewatering, etc.) drains or discharges from the site (including any discharges into surfaces waters (wetlands, creeks, and/or ditches) located within the property.
- Permittees must sample stormwater discharges for pH if the project involves any amount of engineered soils (cement treated base, cement kiln dust, fly ash, etc.) or more than 1,000 cubic yards of poured and/or recycled concrete.
- The permit sets benchmark (target) levels for turbidity, transparency, and pH. When discharge samples exceed a benchmark, you must follow additional permit requirements.
- Submit all sampling data to Ecology each month on the enclosed discharge monitoring report (DMR). The DMR includes instructions on how to perform sampling and reporting. You must submit a DMR to Ecology even if you do not collect any samples.

High Turbidity Phone Reporting (Special Condition S5.A, page 15 for more information)

- If your site discharges stormwater with a turbidity result greater than or equal to 250 NTUs, you must notify Ecology by phone within 24 hours. Call the Ecology regional office and state, "I'm reporting a high turbidity construction stormwater discharge of (your sample result) NTUs." Include all of the following information in your phone message:

1. Your Name / Phone Number	4. Date / Time of Call
2. Permit Number	5. Date / Time of Sample
3. City / County of Project	6. Project Name

Ecology Regional Office & Phone Number
Northwest Region (Kitsap, Snohomish, Island, King, San Juan, Skagit, Whatcom): (425) 649-7000

Discharge Monitoring Reports (Special Condition S5.B, page for additional information)

- Permittees must submit DMRs to Ecology each month, even if there is no discharge to report.
- You must ensure that the DMRs arrive at Ecology by the 15^{th} of each month. Please plan accordingly to meet this requirement.

Discharges to Impaired Waterbodies (Special Condition S8, pages 18-21 for more information)

- If your site discharges to a water body that is on the impaired waterbodies list (i.e., 303(d) list) for turbidity, fine sediment, high pH, or phosphorus, you must sample for more parameters. Ecology will notify you if any additional sampling requirements apply.

Stormwater Pollution Prevention Plan (Special Condition S9, pages 21-29 for more information)

- Your site must have a complete Stormwater Pollution Prevention Plan (SWPPP). You must keep it on site (or within reasonable access to the site) prior to the start of construction to protect water quality. The SWPPP describes the erosion and sediment control measures you will use based on the site conditions.
- Remember to keep your SWPPP updated. The permit contains specific timelines for SWPPP updates based on inspection results by the CECSL or an Ecology inspector.

Permit Transfer

- When you sell or transfer operational control of all or a portion of your site to one or more new operator(s), you must also transfer permit coverage.
- To transfer permit coverage, submit a Transfer of Coverage form to Ecology. You can download the form from our website listed at the end of this letter.

Notice of Termination (Special Condition S10, page 29 for additional information)

- You may terminate (cancel) permit coverage when your site is stabilized with permanent vegetation or equivalent measures that prevent erosion. You may also terminate coverage if all unstabilized areas have been sold or transferred.
- To request termination of permit coverage, submit a Notice of Termination (NOT) to Ecology. If you do not submit an NOT, you will remain responsible for permit compliance and permit fees. You can download the form from our website listed at the end of this letter.

Appeal of Permit Coverage

You may appeal the terms and conditions of a general permit, as they apply to an individual discharger, within 30 days of the effective date of coverage of that discharger (see Chapter 43.21B RCW). This appeal is limited to the general permit's applicability or non-applicability to a specific discharger.

The Revised Code of Washington (RCW) 43.21.B310, contains procedures and requirements for the appeal process. Appeals should be directed to:

Pollution Control Hearings Board PO Box 40903 Olympia, Washington 98504-0903	Department of Ecology Appeals Coordinator P.O. Box 47608 Olympia, Washington 98504-7608

Additional Information

Ecology is committed to providing assistance to you. Please review our web page at http://www.ecy.wa.gov/programs/wq/stormwater/construction/. Now available — a stormwater sampling video that demonstrates appropriate sampling methods!

Questions
For questions about transfers, terminations, and other administrative issues, please contact Charles Gilman at 360-407-6437 or chgi461@ecy.wa.gov.

Ecology Regional Assistance
If you have questions regarding stormwater management issues at your construction site, please contact Mak Kaufman (360-715-5221) of Ecology's Bellingham Field Office.

If you have questions regarding this letter, please call Charles Gilman at 360-407-6437

Sincerely,

Bill Moore

Bill Moore, P.E., Manager
Program Development Services Section
Water Quality Program

Enclosure: Construction Stormwater General Permit
Inspection Report Template

cc: Ecology Permit Fee Unit, HQ
Stormwater File, HQ

Construction Stormwater
SITE INSPECTION CHECKLIST

Project_____________ Permit No.____________ Inspector_____________ Date________ Time_______

Will existing BMPs need to be modified or removed, or other BMPs installed? YES NO
IF YES, list the action items to be completed on the following table:

Actions to be Completed	Date Completed/ Initials
1.	
2.	
3.	
4.	
5.	
6.	

Describe current weather conditions

Approximate amount of precipitation since last inspection: ___________ inches
and precipitation in the past 24 hours*: ___________inches
**based on an on-site rain gauge or local weather data.*

Describe discharging stormwater, if present. Note the presence of suspended sediment, "cloudiness", discoloration, or oil sheen.

Was water quality sampling part of this inspection? YES NO
If yes, record results below (attach separate sheet, if necessary):

Parameter	Method (circle one)	Result	Units
Turbidity	tube, meter, laboratory		NTU (cm, if tube used)
pH	paper, kit, meter		pH standard units

Is the site in compliance with the SWPPP and the permit requirements? YES NO
If no, indicate tasks necessary to bring site into compliance on the "Actions to be Completed" table above, and include dates each job WILL BE COMPLETED.
If no, has the non-compliance been reported to Dept. of Ecology? YES NO
If no, should the SWPPP be modified: YES NO

Sign the following certification:
"I certify that this report is true, accurate, and complete, to the best of my knowledge and belief."

Inspection completed on:_____________ by: (print+signature)____________________

Title/Qualification of Inspector:____

Construction Stormwater
SITE INSPECTION CHECKLIST

Project______________ Permit No.___________ Inspector____________ Date________ Time______

Site BMPs	Overall Condition	Need Repair?	Comments/Observations
Clearing Limits			
• *Buffer Zones around sensitive areas*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Construction Access/Roads			
• *Stabilized site entrance*	G F P	Y N	
• *Stabilized roads/parking area*	G F P	Y N	
•	G F P	Y N	
Control Flow Rates			
• *Swale*	G F P	Y N	
• *Dike*	G F P	Y N	
• *Sediment pond*	G F P	Y N	
• *Sediment trap*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Install Sediment Controls			
• *Sediment pond/trap*	G F P	Y N	
• *Silt fence*	G F P	Y N	
• *Straw bale barriers*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Preserve Vegetation/Stabilize Soils			
• *Nets and blankets*	G F P	Y N	
• *Mulch*	G F P	Y N	
• *Seeding*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Protect Slopes			
• *Terrace*	G F P	Y N	
• *Pipe slope drains*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Protect Drain Inlets			
• *Inserts*	G F P	Y N	
•	G F P	Y N	
•	G F P	Y N	
Stabilize Channels and Outlets			
• *Conveyance channels*	G F P	Y N	
• *Energy dissipators*	G F P	Y N	
•	G F P	Y N	
Control Pollutants			
• *Chemical Storage Area covered*	G F P	Y N	
• *Concrete handling*	G F P	Y N	
•	G F P	Y N	
Control De-watering			
•	G F P	Y N	

G=Good F=Fair P=Poor Y=Yes N=No

Excerpt from *How to do Stormwater Monitoring,* Publication # 06-10-020

PERMIT NUMBER WAR-011650

CONSTRUCTION STORMWATER GENERAL PERMIT
DISCHARGE MONITORING REPORT (DMR)

PROJECT INFORMATION

Site Name: Former Scott Paper Mill Cleanup
Disturbed Acreage: 16.0
Location: 20th St & Q Ave, Anacortes, WA
County: Skagit

Owner Name: Port of Anacortes
Permittee/Operator: Becky Darden
Mailing Address: P.O. Box 297
Anacortes, WA 98221

MONITORING DOCUMENTATION

Unique Discharge/Monitoring Point: ____________________
(Use same description each month, use one DMR for each monitoring point)

Monitoring Period: ______________
(Month/Year)

Please send your Discharge Monitoring Report (DMR) to Ecology every month, <u>even if there is no discharge</u>. Also, read the attached instructions before completing the DMR. If a section does not apply, please annotate "N/A", leaving no blanks.

Weekly Monitoring	Sampling Date (Month/Day/Year)	Turbidity (NTU's-Nephelometric Turbidity Units)	Transparency (Centimeters)	pH (If applicable)	Treatment BMPs Used Prior to Discharge from Site (List all that apply) P = Sediment Pond/Trap/Tank/Vault C = Chemical Treatment/Sand Filter S = Silt Fence W = Straw Wattles/Coir Wattles D = Check Dam/Triangular Silt Dike O = Other	No Discharge This Week (Check if applicable)
Example	10/06/06	32	N/A	N/A	P, S, W	
Week 1						
Week 2						
Week 3						
Week 4						
Week 5						

☐ No soil disturbing construction activities have taken place on the site yet. Construction is expected to begin on __________

☐ There was no discharge during normal working hours this month (provide comments or explanation below)

COMMENTS / EXPLANATIONS (ATTACH EXTRA SHEET IF NECESSARY):

NAME / PHONE NUMBER OF ON-SITE CONTACT PERSON WHO CAN ANSWER QUESTIONS RELATED TO THIS REPORT:

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY JUDGEMENT OR MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION; I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 USC § 1001 AND 33 USC § 1319. *(PENALTIES UNDER THESE STATUES MAY INCLUDE FINES UP TO $10,000.00 AND/ OR MAXIMUM IMPRISONMENT OF BETWEEN SIX MONTHS AND FIVE YEARS.)*

NAME/TITLE OF PERSON WITH SIGNATORTY AUTHORITY (SEE INSTRUCTIONS)	DATE: MONTH DAY YEAR
SIGNATURE OF PERSON WITH SIGNATORY AUTHORITY	PHONE NUMBER OF PERSON WITH SIGNATORY AUTHORITY

MAIL YOUR DMR (WITHOUT INSTRUCTIONS PAGE) TO:
DEPARTMENT OF ECOLOGY, WATER QUALITY PROGRAM – CONSTRUCTION STORMWATER, P.O. BOX 47696, OLYMPIA, WA 98504-7696

PERMIT NUMBER WAR-011650

DAILY TURBIDITY/TRANSPARENCY SAMPLING LOG

Note: Daily sampling is triggered by turbidity'sampling results over 250 NTU's, or transparency results less than 6 cm.

S	M	T	W	T	F	S

MAIL YOUR DMR (WITHOUT INSTRUCTIONS PAGE) TO:
DEPARTMENT OF ECOLOGY, WATER QUALITY PROGRAM – CONSTRUCTION STORMWATER, P.O. BOX 47696, OLYMPIA, WA 98504-7696

INSTRUCTIONS AND FREQUENTLY ASKED QUESTIONS FOR COMPLETING THE DMR FORM

PROJECT INFORMATION

1. How can I update contact information and/or mailing addresses? You can update any project information by submitting a Notice of Intent (NOI) Application Form and checking the box in the upper right hand corner next to "Change/Update Permit Information". Complete only the boxes that are being updated and submit the signed form to the same address as the DMR.

MONITORING DOCUMENTATION

1. How often do I sample? Once you disturb the soil, you must conduct sampling at least once every calendar week when stormwater (or authorized non-stormwater) flows off of the site.

2. Where do I sample? You must take samples from all discharge points where stormwater (or authorized non-stormwater such as de-watering water) flows off-site.

3. When stormwater leaves my site from more than one location, what do I need to do?
   a. Use a separate DMR sheet for each location where stormwater is discharged from the site.
   b. Enter a unique name or description of the monitoring location (for example: Pond 1; or West Ditch). You must use the **same** monitoring location name each month.
   c. Identify all sampling point(s) on the map in your Storm Water Pollution Prevention Plan (SWPPP). You must also clearly mark each sample point in the field with a flag, tape, stake or other visible marker.

4. What if I don't have a discharge off site for an entire week? If there was no discharge during **a calendar week**, you need not take a sample. Mark an X in the "No Discharge" column for that week on the DMR form. If there was no discharge **during a calendar month**, mark the "No Discharge" box at the bottom of the table.

5. If it rains at 3 AM on my site, do I have to get up and sample at that hour? You need not sample outside of normal working hours or during unsafe conditions. If you are unable to sample during a monitoring period, you must include a brief explanation in the "Comment/Explanation" box of the DMR.

6. What kind of stormwater turbidity/transparency sampling do I have to do? If construction activity disturbs 5 acres or more, the permit requires you to conduct turbidity sampling, using a turbidity meter. If construction activity disturbs greater than or equal to 1 acre, but less than 5 acres, you may use either a transparency tube **or** a turbidity meter. You must enter turbidity or transparency values collected each week on the DMR.

7. What if my turbidity result is greater than 250 NTU or my transparency is less than 6 centimeters (cm)? If any discharge is greater than 250 NTU or less than 6 centimeters (cm) transparency, you must begin daily sampling. You must also record the values in the attached sampling log (on page 2). Write the date, sampling result (value), and unit (NTU or cm). Continue to sample daily until:
   a. Turbidity is 25 NTU (or lower); or
   b. Transparency is 31 cm (or greater); or
   c. The CESCL has determined compliance with the water quality standard for turbidity:
      1. No more than 5 NTU over background turbidity, if background is less than 50 NTU, or
      2. No more than 10% over background turbidity, if background is 50 NTU or greater; or
   d. The discharge stops or is eliminated.

8. When do I have to sample for pH? If construction activity will result in the disturbance of 1 acre or more, **and** involves *significant concrete work* or the use of *engineered soils*, **and** stormwater from the affected area drains to surface waters of the state or to a storm sewer system, the Permittee must conduct *pH* monitoring:
   a. Definitions:
      - *Significant Concrete Work* means greater than 1,000 cubic yards poured or recycled concrete.
         - For poured concrete, the 1,000 cubic yard threshold is met if a single or multiple concrete pours on the site results in greater than 1,000 cubic yards of concrete curing at the same time. Typical curing time is less than 30 days. If individual concrete pours smaller than 1,000 cubic yards occur more than 30 days apart, pH sampling is not required unless required by Ecology order.
         - For recycled concrete, the 1,000 cubic yard threshold is met if greater than 1,000 cubic yards of concrete is recycled or crushed on-site.
      - *Engineered Soils* means the use of soil amendments including, but not limited to, Portland cement treated base (CTB), cement kiln dust (CKD), or fly ash to achieve certain desirable soil characteristics.

b. For *significant concrete work*, pH monitoring begins when the concrete is first exposed to precipitation and continues weekly until stormwater pH is 8.5 or less prior to discharge.
c. For sites with engineered soils, the pH monitoring period commences when the soil amendments are first exposed to precipitation and continues until the area of engineered soils is fully stabilized.
d. During the pH monitoring period, the Permittee must obtain a representative sample of stormwater and conduct pH analysis at least once per week.
e. The Permittee must monitor pH in the sediment trap/pond(s) or other locations prior to discharge from the site.
f. The benchmark value for pH is 8.5 standard units. Any time sampling indicates that pH is 8.5 or greater, the Permittee must:
   1. Prevent the high pH water (8.5 or above) from entering the storm sewer systems or surface waters; and
   2. If necessary, adjust or neutralize the high pH water using an appropriate treatment BMP such as carbon dioxide (CO_2) sparging or dry ice. The permittee must obtain written approval from Ecology prior to using any form of chemical treatment other than CO_2 sparging or dry ice. Information on CO_2 sparging / dry ice BMP can be found on Ecology's web site at: www.ecy.wa.gov/programs/wq/stormwater.
g. The Permittee shall perform pH analysis on-site with a calibrated pH meter, pH test kit, or wide range pH indicator paper. The Permittee must record pH monitoring results in the site log book.

9. What do the treatment BMP letter codes on the form mean? For any discharge, report the type of treatment Best Management Practice(s) (BMPs) applied to the stormwater (or non-stormwater) prior to discharge from the site. Use the letter code (e.g., P for Pond) that corresponds to the type of BMP used for the specific discharge. BMP codes are listed on the DMR. If multiple treatment BMPs are used, list the letter code for each type of BMP.

9. What if I haven't started clearing or grading my site? If you have not began initial soil disturbing activity yet, mark an X in the applicable box. Indicate estimated construction start date, and continue to submit the DMR each month.

10. Who should sign the report?
   A. This report must be signed as follows:
      1. Corporations, by a responsible corporate officer of at least the level of vice president of a corporation or a duly authorized representative;
      2. Partnerships, by a general partner of a partnership or a duly authorized representative;
      3. Sole proprietorships, by the proprietor or a duly authorized representative; or
      4. Municipal, state, or other public facility, by either a principal executive officer, ranking elected official or a duly authorized representative.
   B. A person is a duly authorized representative only if:
      1. The authorization is made in writing by a person described above and submitted to the Ecology.
      2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or having overall responsibility for environmental matters.
   C. Changes to authorization:
      If an authorization is no longer accurate, submit a new authorization to Ecology prior to (or together with) any reports, information, or applications to be signed by an authorized representative.

ADDITIONAL SAMPLING

1. What if I take additional samples or have more information to submit than will fit on the provided forms? You can submit any additional information on separate sheets of paper. You may also attach lab sheets, if you use a lab for analysis. Please sign, date, and document the site information on those sheets so that they can be included in your file.

ADDITIONAL INFORMATION

1. Mail the DMR to: **Department of Ecology, Water Quality Program- Construction Stormwater, P.O. Box 47696, Olympia, WA 98504-7696**

2. Who can I call for assistance? If you have questions or concerns, please contact Ecology's Water Quality Reception Desk at (360) 407-6600. Please have your site name, location, and permit number available when calling.

For more information, additional forms and/or additional copies of the permit; please visit our web site: http://www.ecy.wa.gov/programs/wq/stormwater/construction.

FORMER SCOTT PAPER MILL CLEANUP
WAR-011650
5/04/2009

Issuance Date: November 16, 2005
Effective Date: December 16, 2005
Expiration Date: December 16, 2010

CONSTRUCTION STORMWATER GENERAL PERMIT

National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated With Construction Activity

State of Washington
Department of Ecology
Olympia, Washington 98504-7600

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1251 et seq.

Until this permit expires, is modified or revoked, Permittees that have properly obtained coverage under this general permit are authorized to discharge in accordance with the special and general conditions which follow.

David C. Peeler, Manager
Water Quality Program
Washington State Department of Ecology

TABLE OF CONTENTS

SUMMARY OF PERMIT REPORT SUBMITTALS

Refer to the Special and General Conditions for additional submittal requirements.

Permit Section	Submittal	Frequency	First Submittal Date
S5.A	High Turbidity/Transparency Phone Reporting	As Necessary	Within 24 hours
S5.B	Discharge Monitoring Report	Monthly	Within 15 days after the applicable monitoring period
S5.F	Noncompliance Notification	As necessary	Immediately
S5.F	Noncompliance Notification – Written Report	As necessary	Within 5 Days of non-compliance
G2.	Notice of Change in Authorization	As necessary	
G6.	Permit Application for Substantive Changes to the Discharge	As necessary	
G8.	Application for Permit Renewal	1/permit cycle	No later than 180 days before expiration
G9.	Notice of Permit Transfer	As necessary	
G20.	Notice of Planned Changes	As necessary	
G22.	Reporting Anticipated Non-compliance	As necessary	

SUMMARY OF REQUIRED ON SITE DOCUMENTATION

Permit Conditions	Document Title
Conditions S2, S5	Permit Coverage Letter
Conditions S2, S5	Construction Stormwater General Permit
Conditions S4, S5	Site Log Book
Conditions S9, S5	Stormwater Pollution Prevention Plan (SWPPP)

SPECIAL CONDITIONS

S1. PERMIT COVERAGE

A. Permit Area

This general permit covers all areas of Washington State, except for federal and tribal lands specified in S1.D.3.

B. Operators Required to Seek Coverage Under this General Permit:

1. *Operators* of the following *construction activities* are required to seek coverage under this permit:

   a. Clearing, grading and/or excavation which results in the disturbance of one or more acres, and discharges *stormwater* to *surface waters of the state*; and clearing, grading and/or excavation on *sites* smaller than one acre which are part of a larger *common plan of development or sale*, if the common plan of development or sale will ultimately disturb one acre or more, and discharges stormwater to surface waters of the state.

      i. This includes forest practices that are part of a construction activity that will result in the disturbance of one or more acres, and discharges to surface waters of the state (i.e., forest practices which are preparing a site for construction activities); and

   b. Any size construction activity discharging stormwater to waters of the state which the Department of Ecology (Ecology):

      i. Determines to be a *significant contributor of pollutants* to waters of the state of Washington, or

      ii. Reasonably expects to cause a violation of any water quality standard.

2. Operators of the following activities are not required to seek coverage under this permit, unless specifically required under Condition S1.B.1.b. (Significant Contributor):

   a. Construction activities which discharge all stormwater and non-stormwater to *ground water*, and have no *point source* discharge to surface water or a *storm sewer system* that drains to surface waters of the state;

   b. Construction activities covered under an Erosivity Waiver (Condition S2.C);

   c. Routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

C. Authorized Discharges:

1. Stormwater Associated with Construction Activity. Subject to compliance with the terms and conditions of this permit, *Permittees* are authorized to discharge stormwater associated with construction activity to surface waters of the state or to a storm sewer system that drains to surface waters of the state.

2. Stormwater Associated with Construction Support Activity. This permit also authorizes stormwater discharges from support activities related to the permitted construction site (e.g., off-site equipment staging yards, material storage areas, borrow areas, etc.) provided:

   a. The support activity is directly related to the permitted construction site that is required to have an NPDES permit; and

   b. The support activity is not a commercial operation serving multiple unrelated construction projects, and does not operate beyond the completion of the construction activity; and

   c. Appropriate controls and measures are identified in the *Stormwater Pollution Prevention Plan* (SWPPP)for the discharges from the support activity areas.

3. Non-Stormwater Discharges. The categories and sources of non-stormwater discharges identified below are conditionally authorized, provided the discharge is consistent with the terms and conditions of this permit:

   a. Discharges from fire fighting activities;

   b. Fire hydrant system flushing;

   c. Potable water including uncontaminated water line flushing (de-chlorinated);

   d. Pipeline hydrostatic test water;

   e. Uncontaminated air conditioning or compressor condensate;

   f. Uncontaminated ground water or spring water;

   g. Uncontaminated excavation *de-watering* (in accordance with S9.D.10)

   h. Uncontaminated discharges from foundation or footing drains;

   i. Water used to control dust;

   j. Routine external building wash down that does not use detergents; and

   k. Landscape irrigation.

All authorized non-stormwater discharges, except for discharges from fire fighting activities, shall be adequately addressed in the SWPPP and comply with Special Condition S3.

D. Limitations on Coverage

The *Director* may require any *discharger* to apply for and obtain coverage under an individual permit or another more specific general permit. Such alternative coverage will be required when Ecology determines that this general permit does not provide adequate assurance that *water quality* will be protected; or there is a reasonable potential for the project to cause or contribute to a violation of water quality standards.

The following stormwater discharges are not covered by this permit:

1. Post-construction stormwater discharges that originate from the site after construction activities have been completed and the site has undergone *final stabilization*.

2. Nonpoint source silvicultural activities such as nursery operations, site preparation, reforestation and subsequent cultural treatment, thinning, prescribed burning, pest and fire control, harvesting operations, surface drainage, or road construction and maintenance from which there is natural runoff as excluded in 40 CFR Subpart 122.27.

3. Stormwater from any federal project or project on federal land or land within an Indian Reservation except for the Puyallup Reservation. Within the Puyallup Reservation, any project that discharges to surface water on land held in trust by the federal government may be covered by this permit.

4. Stormwater from any site covered under an existing NPDES individual permit in which stormwater management and/or treatment requirements are included for all stormwater discharges associated with construction activity.

5. Where an applicable Total Maximum Daily Load (TMDL) specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

S2. APPLICATION REQUIREMENTS

A. Permit Application Forms

1. Notice of Intent Form/Timeline

a. Operators of new or previously unpermitted construction activities shall submit a complete and accurate permit application form [*Notice of Intent* (NOI)] to Ecology. *Applicants* are encouraged to use Ecology's internet-based electronic NOI to apply for permit coverage.

b. The NOI shall be submitted on or before the date of the first public notice (see Condition S2.B below) and at least 60 days prior to the discharge of stormwater from construction activities. The 30-day public comment period required by WAC 173-226-130(5) begins on the publication date of the second public notice. Unless Ecology responds to the complete application in writing, based on public comments, or any other relevant factors, coverage under the general permit will automatically commence on the thirty-first day following receipt by Ecology of a completed NOI, or the issuance date of this permit, whichever is later; unless a later date is specified by Ecology in writing.

c. Applicants that discharge to a storm sewer system operated by Seattle, King County, Snohomish County, Tacoma, Pierce County, or Clark County shall also submit a copy of the NOI to the appropriate jurisdiction.

2. Transfer of Coverage Form
Current coverage under this permit may be transferred to one or more new operators, including operators of sites within a Common Plan of Development, by submitting a Transfer of Coverage Form in accordance with Condition G9. Transfers do not require public notice.

B. Public Notice

For new or previously unpermitted sites, the applicant shall publish a public notice at least one time each week for two consecutive weeks, with a 7-day time span between dates, in a newspaper that has general circulation in the county in which the construction is to take place. The notice shall contain the following:

1. A statement that "The applicant is seeking coverage under the Washington State Department of Ecology's Construction Stormwater NPDES and State Waste Discharge General Permit";

2. The name, address and location of the construction site;

3. The name and address of the applicant;

4. The type of construction activity that will result in a discharge, (e.g., residential construction, commercial construction, etc.) and the number of acres to be disturbed;

5. The name of the receiving water(s) (i.e., the surface water(s) that the site will discharge to), or if the discharge is through a storm sewer system, the name of the operator of the storm sewer; and

6. The statement: "Any person desiring to present their views to the Department of Ecology regarding this application, or interested in the Department's action on this application may notify the Department of Ecology in writing within 30 days of the last date of publication of this notice. Comments can be submitted to: Department of Ecology, P.O. Box 47696, Olympia, WA 98504-7696, Attn: Water Quality Program, Construction Stormwater".

C. Erosivity Waiver

Operators may qualify for a waiver from the permit if the following conditions are met:

1. The site will result in the disturbance of less than 5 acres; and the site is not a portion of a common plan of development or sale that will disturb 5 acres or greater.

2. Calculation of Erosivity "R" Factor and Regional Timeframe:

   a. The project's rainfall erosivity factor ("R" Factor) must be less than 5 during the period of construction activity, as calculated using the Texas A&M University online rainfall erosivity calculator at: http://ei.tamu.edu/. The period of construction activity begins at initial earth disturbance and ends with *final stabilization*; and, in addition:

   b. The entire period of construction activity must fall within the following timeframes:

      i. For sites west of the Cascades Crest: June 15 – September 15; or

      ii. For sites east of the Cascades Crest, excluding the Central Basin: June 15 – October 15; or

      iii. For sites east of the Cascades Crest, within the Central Basin*; no additional timeframe restrictions apply.

      *Note: The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches.

3. Operators must submit a complete Erosivity Waiver Certification Form at least one week prior to commencing land disturbing activities. Certification must include:

   a. A statement that the operator will comply with applicable local stormwater requirements; and

   b. A statement that the operator will implement appropriate *erosion and sediment control BMPs* to prevent violations of water quality standards.

4. This waiver is not available for facilities declared a significant contributor of *pollutants* as defined in Condition S1.B.1.b.

5. This waiver does not apply to construction activity which includes non-stormwater discharges listed in S1.C.3.

6. If construction activity extends beyond the certified waiver period for any reason, the operator shall either:

a. Recalculate the rainfall erosivity "R" factor using the original start date and a new projected ending date and, if the "R" factor is still under 5 and the entire project falls within the applicable regional timeframe in S2.C.2.b, complete and submit an amended waiver certification form before the original waiver expires; or

b. Submit a complete permit application to Ecology in accordance with Condition S2.A and B before the end of the certified waiver period.

S3. COMPLIANCE WITH STANDARDS

A. Discharges shall not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), ground water quality standards (Chapter 173-200 WAC), *sediment* management standards (Chapter 173-204 WAC), and human health-based criteria in the National Toxics Rule (40 CFR Part 131.36). Discharges that are not in compliance with these standards are not authorized.

B. Prior to the discharge of stormwater and non-stormwater to *waters of the state*, the Permittee shall apply all known, available, and reasonable methods of prevention, control, and treatment (*AKART*). This includes the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate *best management practices* (BMPs) installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.

C. Compliance with water quality standards shall be presumed, unless discharge monitoring data or other site specific information demonstrates that a discharge causes or contributes to a violation of water quality standards, when the Permittee is:

1. In full compliance with all permit conditions, including planning, sampling, monitoring, reporting, and recordkeeping conditions; and

2. Fully implementing stormwater BMPs contained in *stormwater management manuals* published or approved by Ecology, or BMPs that are *demonstrably equivalent* to BMPs contained in stormwater technical manuals published or approved by Ecology, including the proper selection, implementation, and maintenance of all applicable and appropriate BMPs for on-site *pollution* control.

D. For sites that discharge to both surface water and ground water, all ground water discharges are also subject to the terms and conditions of this permit. Permittees who discharge to ground water through an *injection well* shall comply with any applicable requirements of the Underground Injection Control (UIC) regulations, Chapter 173-218 WAC.

S4. MONITORING REQUIREMENTS

The primary monitoring requirements are summarized in Table 3 (below):

Table 3. Summary of Monitoring Requirements[1]

Size of Soil Disturbance[2]	Weekly Site Inspections	Weekly Sampling w/ Turbidity Meter	Weekly Sampling w/ Transparency Tube	Weekly pH sampling[3]
Sites which disturb less than 1 acre	Required	Not Required	Not Required	Not Required
Sites which disturb 1 acre or more, but less than 5 acres	Required	Sampling Required – either method[4]		Required
Sites which disturb 5 acres or more	Required	Required	Not Required[5]	Required

A. Site Log Book

The Permittee shall maintain a site log book that contains a record of the implementation of the SWPPP and other permit requirements including the installation and maintenance of BMPs, site inspections, and stormwater monitoring.

B. Site Inspections

1. Site inspections shall include all areas disturbed by construction activities, all BMPs, and all stormwater discharge points. Stormwater shall be visually examined for the

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[1] Additional monitoring requirements may apply for: 1) discharges to 303(d) listed waterbodies and waterbodies with applicable TMDLs for turbidity, fine sediment, high pH, or phosphorus - see Condition S8; and 2) sites required to perform additional monitoring by Ecology order – see Condition G13.

[2] Soil disturbance is calculated by adding together all areas affected by construction activity. Construction Activity means clearing, grading, excavation, and any other activity which disturbs the surface of the land, including ingress/egress from the site.

[3] Beginning October 1, 2006, if construction activity involves significant concrete work or the use of engineered soils, and stormwater from the affected area drains to a stormwater collection system or other surface water, the Permittee shall conduct pH sampling in accordance with Condition S4.D.

[4] Beginning October 1, 2008, sites with one or more acres, but less than 5 acres of soil disturbance, shall conduct turbidity or transparency sampling in accordance with Condition S4.C.

[5] Beginning October 1, 2006, sites greater than or equal to 5 acres of soil disturbance shall conduct turbidity sampling using a turbidity meter in accordance with Condition S4.C.

presence of suspended sediment, turbidity, discoloration, and oil sheen. Inspectors shall evaluate the effectiveness of BMPs and determine if it is necessary to install, maintain, or repair BMPs to improve the quality of stormwater discharges.

Based on the results of the inspection, the Permittee shall correct the problems identified as follows:

a. Review the SWPPP for compliance with Condition S9 and make appropriate revisions within 7 days of the inspection; and

b. Fully implement and maintain appropriate *source control* and/or *treatment BMPs* as soon as possible, but no later than 10 days of the inspection; and

c. Document BMP implementation and maintenance in the site log book.

2. The site inspections shall be conducted at least once every *calendar week* and within 24 hours of any discharge from the site. The inspection frequency for temporarily stabilized, inactive sites may be reduced to once every calendar month.

3. Site inspections shall be conducted by a person who is knowledgeable in the principles and practices of erosion and sediment control. The inspector shall have the skills to:

   a. Assess the site conditions and construction activities that could impact the quality of stormwater, and

   b. Assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

4. Beginning October 1, 2006, construction sites one acre or larger that discharge stormwater to surface waters of the state, shall have site inspections conducted by a *Certified Erosion and Sediment Control Lead* (CESCL). The CESCL shall be identified in the SWPPP and shall be present on-site or on-call at all times. Certification shall be obtained through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology (see BMP C160 in the Manual).

5. The inspector shall summarize the results of each inspection in an inspection report or checklist and be entered into, or attached to, the site log book. At a minimum, each inspection report or checklist shall include:

   a. Inspection date and time.

   b. Weather information; general conditions during inspection and approximate amount of precipitation since the last inspection, and within the last 24 hours.

   c. A summary or list of all BMPs which have been implemented, including observations of all erosion/sediment control structures or practices.

   d. The following shall be noted:

      i. locations of BMPs inspected,

ii. locations of BMPs that need maintenance,

iii. the reason maintenance is needed,

iv. locations of BMPs that failed to operate as designed or intended, and

v. locations where additional or different BMPs are needed, and the reason(s) why.

e. A description of stormwater discharged from the site. The inspector shall note the presence of suspended sediment, turbid water, discoloration, and/or oil sheen, as applicable.

f. Any water quality monitoring performed during inspection.

g. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.

h. A statement that, in the judgment of the person conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the SWPPP and the permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance, as well as a schedule of implementation.

i. Name, title, and signature of the person conducting site inspection; and the following statement: "I certify that this report is true, accurate, and complete, to the best of my knowledge and belief".

C. Turbidity/Transparency Sampling Requirements

1. Sampling Methods/Effective Dates

a. Beginning October 1, 2006, if construction activity will involve the disturbance of 5 acres or more, the Permittee shall conduct *turbidity* sampling per Condition S4.C.

b. Beginning October 1, 2008, if construction activity will involve greater than or equal to 1 acre, but less than 5 acres of soil disturbance, the Permittee shall conduct *transparency* sampling or turbidity sampling per Condition S4.C.

2. Sampling Frequency

a. Sampling shall be conducted at least once every calendar week, when there is a discharge of stormwater (or authorized non-stormwater) from the site. Samples shall be *representative* of the flow and characteristics of the discharge.

b. When there is no discharge during a calendar week, sampling is not required.

c. Sampling is not required outside of normal working hours or during unsafe conditions. If a Permittee is unable to sample during a monitoring period, the Discharge Monitoring Report (DMR) shall include a brief explanation.

3. Sampling Locations

   a. Sampling is required at all discharge points where stormwater (or authorized non-stormwater) is discharged off-site.

   b. All sampling point(s) shall be identified on the SWPPP site map and be clearly marked in the field with a flag, tape, stake or other visible marker.

4. Sampling and Analysis Methods

   a. Turbidity analysis shall be performed with a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. The results shall be recorded in the site log book in Nephelometric Turbidity Units (NTU).

   b. Transparency analysis shall be performed on-site with a 1 ¾ inch diameter, 60 centimeter (cm) long Transparency Tube. The results shall be recorded in the site log book in centimeters (cm). Transparency Tubes are available from: http://watermonitoringequip.com/pages/stream.html

Parameter	Units	Analytical Method	Sampling Frequency	Benchmark Value
Turbidity	NTU	SM2130 or EPA180.1	Weekly, if discharging	25 NTU
Transparency	cm	Manufacturer instructions, or Ecology Guidance	Weekly, if discharging	31 cm

5. Turbidity/Transparency Benchmark Values

   The benchmark value for turbidity is 25 NTU (Nephelometric Turbidity Units); and the benchmark value for transparency is 31 cm.

   a. Turbidity 26 – 249 NTU, or Transparency 30 – 7 cm:

      If discharge turbidity is greater than 25 NTU, but less than 250 NTU; or if discharge transparency is less than 31 cm, but greater than 6 cm, the CESCL shall:

      i. Review the SWPPP for compliance with Condition S9 and make appropriate revisions within 7 days of the discharge that exceeded the benchmark; and

      ii. Fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, but within 10 days of the discharge that exceeded the benchmark; and

      iii. Document BMP implementation and maintenance in the site log book.

   b. Turbidity 250 NTU or greater, or Transparency 6 cm or less:

If discharge turbidity is greater than or equal to 250 NTU; or if discharge transparency is less than or equal to 6 cm, the CESCL shall:

i. Notify Ecology by phone in accordance with Condition S5.A.; and

ii. Review the SWPPP for compliance with Condition S9 and make appropriate revisions within 7 days of the discharge that exceeded the benchmark; and

iii. Fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, but within 10 days of the discharge that exceeded the benchmark;

iv. Document BMP implementation and maintenance in the site log book; and

v. Continue to sample discharges daily until:

1. turbidity is 25 NTU (or lower); or
2. transparency is 31 cm (or greater); or
3. the CESCL has demonstrated compliance with the water quality standard for turbidity:
   a. no more than 5 NTU over background turbidity, if background is less than 50 NTU, or
   b. no more than 10% over background turbidity, if background is 50 NTU or greater; or
4. the discharge stops or is eliminated.

D. <u>pH Monitoring: Sites with Significant Concrete Work or Engineered Soils</u>

Beginning October 1, 2006, if construction activity will result in the disturbance of 1 acre or more, **and** involves *significant concrete work* or the use of *engineered soils*, **and** stormwater from the affected area drains to surface waters of the state or to a storm sewer system that drains to surface waters of the state, the Permittee shall conduct *pH* monitoring as set forth below:

1. For sites with significant concrete work, the *pH monitoring period* shall commence when the concrete is first exposed to precipitation and continue weekly until stormwater pH is 8.5 or less.
   a. "Significant concrete work" means greater than 1000 cubic yards poured concrete or recycled concrete.
2. For sites with engineered soils, the pH monitoring period shall commence when the soil amendments are first exposed to precipitation and shall continue until the area of engineered soils is *fully stabilized.*

a. "Engineered soils" means soil amendments including, but not limited, to Portland cement treated base (CTB), cement kiln dust (CKD), or fly ash.

3. During the pH monitoring period, the Permittee shall obtain a representative sample of stormwater and conduct pH analysis at least once per week.

4. The Permittee shall monitor pH in the sediment trap/pond(s) or other locations that receive stormwater runoff from the area of significant concrete work or engineered soils prior to discharge to surface waters.

5. The benchmark value for pH is 8.5 standard units. Any time sampling indicates that pH is 8.5 or greater, the Permittee shall:

   a. Prevent the high pH water (8.5 or above) from entering storm sewer systems or surface waters; and

   b. If necessary, adjust or neutralize the high pH water using an appropriate treatment BMP such as CO_2 sparging or dry ice. The Permittee shall obtain written approval from Ecology prior to using any form of chemical treatment other than CO_2 sparging or dry ice.

6. The Permittee shall perform pH analysis on-site with a calibrated pH meter, pH test kit, or wide range pH indicator paper. The Permittee shall record pH monitoring results in the site log book.

S5. REPORTING AND RECORDKEEPING REQUIREMENTS

A. High Turbidity Phone Reporting

Any time sampling performed in accordance with Special Condition S4.C indicates turbidity is 250 NTU or greater (or transparency is 6 cm or less) the Permittee shall notify the appropriate Ecology regional office by phone within 24 hours of analysis.

B. Discharge Monitoring Reports

1. Permittees required to conduct water quality sampling in accordance with Special Conditions S.4.C (Turbidity/Transparency), S4.D (pH) and/or S8 [303(d)/TMDL sampling] shall submit the results to Ecology monthly on Discharge Monitoring Report (DMR) forms provided by Ecology.

   Permittees are authorized and encouraged to submit electronic DMRs using the "E-DMR Form" on Ecology's Construction Stormwater web site: http://www.ecy.wa.gov/programs/wq/stormwater/construction/.

2. The Permittee shall submit DMR forms electronically or by mail to be received by Ecology within 15 days following the end of each month. If there was no discharge during a given monitoring period, the Permittee shall submit the form as required with the words "no discharge" entered in place of the monitoring results. If the Permittee is unable to submit discharge monitoring reports electronically, the Permittee may mail reports to the address listed below:

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, Washington 98504-7696

C. Records Retention

The Permittee shall retain records of all monitoring information (site log book, sampling results, inspection reports/checklists, etc.), Stormwater Pollution Prevention Plan, and any other documentation of compliance with permit requirements during the life of the construction project and for a minimum of three years following the termination of permit coverage. Such information shall include all calibration and maintenance records, and records of all data used to complete the application for this permit. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

D. Recording of Results

For each measurement or sample taken, the Permittee shall record the following information:

1. Date, place, method, and time of sampling or measurement;
2. The individual who performed the sampling or measurement;
3. The dates the analyses were performed;
4. The individual who performed the analyses;
5. The analytical techniques or methods used; and
6. The results of all analyses.

E. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by this permit using test procedures specified by Condition S4 of this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Permittee's DMR.

F. Noncompliance Notification

In the event the Permittee is unable to comply with any of the terms and conditions of this permit which may cause a threat to human health or the environment, the Permittee shall:

1. Immediately notify Ecology of the failure to comply.
2. Immediately take action to prevent the discharge/pollution, or otherwise stop or correct the noncompliance, and, if applicable, repeat sampling and analysis of any noncompliance immediately and submit the results to Ecology within five (5) days after becoming aware of the violation.

3. Submit a detailed written report to Ecology within five (5) days, unless requested earlier by Ecology. The report shall contain a description of the noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

   Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply.

G. Access to Plans and Records

1. The Permittee shall retain the following permit documentation (plans and records) on-site, or within reasonable access to the site, for use by the operator; or on-site review by Ecology or the local *jurisdiction*:

   a. General Permit;

   b. Permit Coverage Letter;

   c. Stormwater Pollution Prevention Plan (SWPPP); and

   d. Site Log Book

2. The Permittee(s) shall address written requests for plans and records listed above (Condition S5.G.1) as follows:

   a. A copy of plans and records shall be provided to Ecology within 14 days of receipt of a written request from Ecology.

   b. A copy of plans and records shall be provided to the public when requested in writing. Upon receiving a written request from the public for the Permittee's plans and records, the Permittee shall either:

      i. Provide a copy of the plans and records to the requestor within 14 days of a receipt of the written request; or

      ii. Notify the requestor within 10 days of receipt of the written request of the location and times within normal business hours when the plans and records may be viewed, and provide access to the plans and records within 14 days of receipt of the written request; or

      iii. Within 14 days of receipt of the written request, the Permittee may submit a copy of the plans and records to Ecology for viewing and/or copying by the requestor at an Ecology office, or a mutually agreed upon location. If plans and records are viewed and/or copied at a location other than at an Ecology office, the Permittee will provide reasonable access to copying services for which a reasonable fee may be charged. The Permittee shall notify the requestor within 10 days of receipt of the request where the plans and records may be viewed and/or copied.

S6. PERMIT FEES

The Permittee shall pay permit fees assessed by Ecology. Fees for stormwater discharges covered under this permit shall be established by Chapter 173-224 WAC. Permit fees will continue to be assessed until the permit is terminated in accordance with Special Condition S10 or revoked in accordance with General Condition G5.

S7. SOLID AND LIQUID WASTE DISPOSAL

Solid and liquid wastes generated by construction activity such as demolition debris, construction materials, contaminated materials, and waste materials from maintenance activities, including liquids and solids from cleaning catch basins and other stormwater facilities, shall be handled and disposed of in accordance with:

1. Special Condition S3, Compliance with Standards, and
2. WAC 173-216-110, and other applicable regulations.

S8. DISCHARGES TO 303(D) OR TMDL WATERBODIES

A. <u>Sampling and Numeric Effluent Limitations For Discharges to 303(d)-listed Waterbodies</u>

1. 1.Permittees that discharge to water bodies listed as impaired by the State of Washington under Section 303(d) of the *Clean Water Act* for turbidity, fine sediment, high pH, or phosphorus, shall conduct water quality sampling according to the requirements of this section.
2. All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current listing by Ecology of impaired waters that exists on November 16, 2005, or the date when the operator's complete permit application is received by Ecology, whichever is later.

B. <u>Discharges to 303(d)-Listed Waterbodies (Turbidity, Fine Sediment, or Phosphorus)</u>

1. Permittees which discharge to waterbodies on the 303(d) list for turbidity, fine sediment, or phosphorus shall conduct turbidity sampling at the following locations to evaluate compliance with the water quality standard for turbidity:

   a. Background turbidity shall be measured in the 303(d)-listed *receiving water* immediately upstream (upgradient) or outside the area of influence of the discharge; and

   b. Discharge turbidity shall be measured at the point of discharge into the 303(d) listed receiving waterbody, inside the area of influence of the discharge; **or**

Alternatively, discharge turbidity may be measured at the point where the discharge leaves the construction site, rather than in the receiving waterbody.

2. Based on sampling, if the discharge turbidity exceeds the water quality standard for turbidity (more than 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or more than a 10% increase in turbidity when the background turbidity is more than 50 NTU), all future discharges shall comply with a numeric effluent limit which is equal to the water quality standard for turbidity.

3. If a future discharge exceeds the water quality standard for turbidity, the Permittee shall:

   a. Review the SWPPP for compliance with Condition S9 and make appropriate revisions within 7 days of the discharge that exceeded the standard;

   b. Fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, but within 10 days of the discharge that exceeded the standard;

   c. Document BMP implementation and maintenance in the site log book;

   d. Notify the appropriate Ecology Regional Office by phone within 24 hours of analysis;

   e. Continue to sample daily until discharge turbidity meets the water quality standard for turbidity.

C. <u>Discharges to waterbodies on the 303(d) list for High pH</u>

1. Permittees which discharge to waterbodies on the 303(d) list for high pH shall conduct sampling at one of the following locations to evaluate compliance with the water quality standard for pH (in the range of 6.5 – 8.5):

   a. pH shall be measured at the point of discharge into the 303(d) listed waterbody, inside the area of influence of the discharge; or

   b. Alternatively, pH may be measured at the point where the discharge leaves the construction site, rather than in the receiving water.

2. Based on the sampling set forth above, if the pH exceeds the water quality standard for pH (in the range of 6.5 – 8.5), all future discharges shall comply with a numeric effluent limit which is equal to the water quality standard for pH.

3. If a future discharge exceeds the water quality standard for pH, the Permittee shall:

   a. Review the SWPPP for compliance with Condition S9 and make appropriate revisions within 7 days of the discharge that exceeded the water quality standard;

b. Fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, but within 10 days of the discharge that exceeded the standards;

c. Document BMP implementation and maintenance in the site log book;

d. Notify the appropriate Ecology Regional Office by phone within 24 hours of analysis; and

e. Continue to sample daily until discharge meets the water quality standard for pH (in the range of 6.5 – 8.5) or the discharge stops or is eliminated.

Parameter identified in 303(d) listing	Parameter/Units	Analytical Method	Sampling Frequency	Water Quality Standard
Turbidity Fine Sediment Phosphorus	Turbidity/NTU	SM2130 or EPA180.1	Weekly, if discharging	If background is 50 NTU or less: 5 NTU over background; or If background is more than 50 NTU: 10% over background
High pH	pH/Standard Units	pH meter	Weekly, if discharging	In the range of 6.5 – 8.5

D. <u>Sampling and Limitations For Sites Discharging to Applicable TMDLs</u>

1. Discharges to a waterbodies subject to an applicable Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus, shall be consistent with the assumptions and requirements of the TMDL.

a. Where an *applicable TMDL* sets specific *waste load allocations* or requirements for discharges covered by this permit, discharges shall be consistent with any specific waste load allocations or requirements established by the applicable TMDL.

ii. The Permittee shall sample discharges weekly, or as otherwise specified by the TMDL, to evaluate compliance with the specific waste load allocations or requirements.

iii. Analytical methods used to meet the monitoring requirements shall conform to the latest revision of the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 CFR Part 136. Turbidity and pH methods need not be accredited or registered unless conducted at a laboratory which must otherwise be accredited or registered.

b. Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but no specific requirements have been identified, compliance with Conditions S4 (Monitoring) and S9 (SWPPPs) will be assumed to be consistent with the approved TMDL.

c. Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with Conditions S4 (Monitoring) and S9 (SWPPPs) will be assumed to be consistent with the approved TMDL.

d. Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

2. Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which has been completed and approved by EPA prior to November 16, 2005, or prior to the date the operator's complete permit application is received by Ecology, whichever is later. TMDLs completed after the operator's complete permit application is received by Ecology become applicable to the Permittee only if they are imposed through an administrative order by Ecology, or through a modification of permit coverage.

S9. STORMWATER POLLUTION PREVENTION PLAN

An adequate Stormwater Pollution Prevention Plan (SWPPP) for construction activity shall be prepared and implemented in accordance with the requirements of this permit beginning with initial soil disturbance and until *final stabilization*.

A. The SWPPP shall meet the following objectives:

1. To implement Best Management Practices (BMPs) to prevent erosion and *sedimentation*, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.
2. To prevent violations of surface water quality, ground water quality, or sediment management standards.
3. To control peak volumetric flow rates and velocities of stormwater discharges.

B. General Requirements

1. The SWPPP shall include a narrative and drawings. All BMPs shall be clearly referenced in the narrative and marked on the drawings.

   The SWPPP narrative shall include documentation to explain and justify the pollution prevention decisions made for the project. Documentation shall include:

   a. Information about existing site conditions (topography, drainage, soils, vegetation, etc.);

b. Potential erosion problem areas;

c. The 12 elements of a SWPPP in S9.D.1-12, including BMPs used to address each element;

d. Construction phasing/sequence and general BMP implementation schedule;

e. The actions to be taken if BMP performance goals are not achieved; and

f. Engineering calculations for ponds and any other designed structures.

2. The Permittee shall modify the SWPPP if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is, or would be, ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The Permittee shall take the following actions:

   a. Review the SWPPP for compliance with Condition S9 and make appropriate revisions within 7 days of the inspection or investigation;

   b. Fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, but no later than 10 days from the inspection or investigation; and

   c. Document BMP implementation and maintenance in the site log book.

3. The Permittee shall modify the SWPPP whenever there is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the state.

C. Stormwater Best Management Practices (BMPs)

BMPs shall be consistent with:

1. Stormwater Management Manual for Western Washington (most recent edition), for sites west of the crest of the Cascade Mountains;

2. Stormwater Management Manual for Eastern Washington (most recent edition), for sites east of the crest of the Cascade Mountains; or

3. Other stormwater management guidance documents or manuals which provide an equivalent level of pollution prevention and are approved by Ecology; or

4. Documentation in the SWPPP that the BMPs selected provides an equivalent level of pollution prevention, compared to the applicable Stormwater Management Manuals, including:

a. The technical basis for the selection of all stormwater BMPs (scientific, technical studies, and/or modeling) which support the performance claims for the BMPs being selected; and

b. An assessment of how the selected BMP will satisfy AKART requirements and the applicable federal technology-based treatment requirements under 40 CFR part 125.3.

D. SWPPP – Narrative Contents and Requirements

The Permittee shall include each of the 12 elements below in S9.D.1-12 in the narrative of the SWPPP and ensure that they are implemented unless site conditions render the element unnecessary and the exemption from that element is clearly justified in the SWPPP.

1. Preserve Vegetation/Mark Clearing Limits

   a. Prior to beginning land disturbing activities, including clearing and grading, clearly mark all clearing limits, *sensitive areas* and their *buffers*, and trees that are to be preserved within the construction area.

   b. The duff layer, native top soil, and natural vegetation shall be retained in an undisturbed state to the maximum degree practicable.

2. Establish Construction Access

   a. Construction vehicle access and exit shall be limited to one route, if possible.

   b. Access points shall be stabilized with a pad of quarry spalls, crushed rock, or other *equivalent BMP*, to minimize the tracking of sediment onto public roads.

   c. Wheel wash or tire baths shall be located on site, if the stabilized construction entrance is not effective in preventing sediment from being tracked onto public roads.

   d. If sediment is tracked off site, public roads shall be cleaned thoroughly at the end of each day, or more frequently during wet weather. Sediment shall be removed from roads by shoveling or pickup sweeping and shall be transported to a controlled sediment disposal area.

   e. Street washing is allowed only after sediment is removed in accordance with S9.D.2.d. Street wash wastewater shall be controlled by pumping back on site or otherwise be prevented from discharging into systems tributary to waters of the state.

3. Control Flow Rates

   a. Properties and waterways downstream from development sites shall be protected from erosion due to increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site, as required by local plan approval authority.

b. Where necessary to comply with S9.D.3.a., stormwater retention or *detention* facilities shall be constructed as one of the first steps in grading. Detention facilities shall be functional prior to construction of site improvements (e.g., impervious surfaces).

c. If permanent infiltration ponds are used for flow control during construction, these facilities shall be protected from siltation during the construction phase.

4. Install Sediment Controls

a. Stormwater runoff from disturbed areas shall pass through a sediment pond or other appropriate sediment removal BMP, prior to leaving a construction site or prior to discharge to an infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but shall meet the flow control performance standard of S9.D.3.a.

b. Sediment control BMPs (sediment ponds, traps, filters, etc.) shall be constructed as one of the first steps in grading. These BMPs shall be functional before other land disturbing activities take place.

c. BMPs intended to trap sediment on site shall be located in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.

5. Stabilize Soils

a. Exposed and unworked soils shall be stabilized by application of effective BMPs that prevent erosion. Applicable BMPs include, but are not limited to: temporary and permanent seeding, sodding, mulching, plastic covering, erosion control fabrics and matting, soil application of polyacrylamide (PAM), the early application of gravel base on areas to be paved, and dust control.

b. Depending on the geographic location of the project, no soils shall remain exposed and unworked for more than the time periods set forth below to prevent erosion:

West of the Cascade Mountains Crest
During the dry season (May 1 - Sept. 30): 7 days
During the wet season (October 1 - April 30): 2 days

East of the Cascade Mountains Crest, except for Central Basin*
During the dry season (July 1 - September 30): 10 days
During the wet season (October 1 - June 30): 5 days

The Central Basin*, East of the Cascade Mountains Crest
During the dry Season (July 1 - September 30): 30 days
During the wet season (October 1 - June 30): 15 days

*Note: The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches.

The time period may be adjusted by a local jurisdiction, if the jurisdiction can show that local precipitation data justify a different standard.

c. Soils shall be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast.

d. Soil stockpiles shall be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from *storm drain* inlets, waterways, and drainage channels.

6. Protect Slopes

a. Design and construct cut and fill slopes in a manner that will minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (e.g., track walking).

b. Off-site stormwater (run-on) or groundwater shall be diverted away from slopes and disturbed areas with interceptor dikes, pipes, and/or swales. Off-site stormwater should be managed separately from stormwater generated on the site.

c. At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion.

i. West of the Cascade Mountains Crest: Temporary pipe slope drains shall handle the peak 10-minute velocity of flow from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis shall use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis shall use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the WWHM to predict flows, bare soil areas should be modeled as "landscaped area."

ii. East of the Cascade Mountains Crest: Temporary pipe slope drains shall handle the expected peak flow velocity from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.

d. Excavated material shall be placed on the uphill side of trenches, consistent with safety and space considerations.

e. Check dams shall be placed at regular intervals within constructed channels that are cut down a slope.

7. Protect Drain Inlets

a. All storm drain inlets made operable during construction shall be protected so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.

b. Inlet protection devices shall be cleaned or removed and replaced when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

8. Stabilize Channels and Outlets

   a. All temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the following expected peak flows:

      i. West of the Cascade Mountains Crest: Channels shall handle the peak 10 minute velocity of flow from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate indicated by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis shall use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis shall use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the WWHM to predict flows, bare soil areas should be modeled as "landscaped area."

      ii. East of the Cascade Mountains Crest: Channels shall handle the expected peak flow velocity from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.

   b. *Stabilization*, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches shall be provided at the outlets of all conveyance systems.

9. Control Pollutants

   a. All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater.

   b. Cover, containment, and protection from vandalism shall be provided for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. On-site fueling tanks shall include secondary containment.

   c. Maintenance, fueling, and repair of heavy equipment and vehicles shall be conducted using spill prevention and control measures. Contaminated surfaces shall be cleaned immediately following any spill incident.

   d. Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system or to the *sanitary sewer* with local sewer district approval.

   e. Application of fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' label requirements for application rates and procedures shall be followed.

f. BMPs shall be used to prevent or treat contamination of stormwater runoff by pH modifying sources. These sources include, but are not limited to: bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout waters. Permittees shall adjust the pH of stormwater if necessary to prevent violations of water quality standards.

g. Permittees shall obtain written approval from Ecology prior to using chemical treatment, other than CO_2 or dry ice to adjust pH.

10. Control De-Watering

a. Foundation, vault, and trench de-watering water, which have similar characteristics to stormwater runoff at the site, shall be discharged into a controlled conveyance system prior to discharge to a sediment trap or sediment pond.

b. Clean, non-turbid de-watering water, such as well-point ground water, can be discharged to systems tributary to, or directly into surface waters of the state, as specified in S9.D.8, provided the de-watering flow does not cause erosion or flooding of receiving waters. Clean de-watering water should not be routed through stormwater sediment ponds.

c. Other de-watering disposal options may include:

i. infiltration

ii. transport offsite in a vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute state waters,

iii. Ecology-approved on-site chemical treatment or other suitable treatment technologies,

iv. sanitary sewer discharge with local sewer district approval, if there is no other option, or

v. use of a sedimentation bag with *outfall* to a ditch or swale for small volumes of localized de-watering.

d. Highly turbid or contaminated dewatering water shall be handled separately from stormwater.

11. Maintain BMPs

a. All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function in accordance with BMP specifications.

b. All temporary erosion and sediment control BMPs shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed.

12. Manage the Project

   a. Development projects shall be phased to the maximum degree practicable and shall take into account seasonal work limitations.

   b. Inspection and Monitoring

      All BMPs shall be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Site inspections and monitoring shall be conducted in accordance with S4.

   c. Maintaining an Updated Construction SWPPP

      The SWPPP shall be maintained, updated, and implemented in accordance with Conditions S3, S4 and S9.

E. <u>SWPPP – Map Contents and Requirements</u>

The SWPPP shall also include a vicinity map or general location map (e.g. USGS Quadrangle map, a portion of a county or city map, or other appropriate map) with enough detail to identify the location of the construction site and receiving waters within one mile of the site.

The SWPPP shall also include a legible site map (or maps) showing the entire construction site. The following features shall be identified, unless not applicable due to site conditions:

1. The direction of north, property lines, and existing structures and roads;
2. Cut and fill slopes indicating the top and bottom of slope catch lines;
3. Approximate slopes, contours, and direction of stormwater flow before and after major grading activities;
4. Areas of soil disturbance and areas that will not be disturbed;
5. Locations of structural and nonstructural controls (BMPs) identified in the SWPPP
6. Locations of off-site material, stockpiles, waste storage, borrow areas, and vehicle/equipment storage areas;
7. Locations of all surface water bodies, including wetlands;
8. Locations where stormwater or non-stormwater discharges off-site and/or to a surface water body, including wetlands;
9. Location of water quality sampling station(s), if sampling is required by state or local permitting authority; and

10. Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.

S10. NOTICE OF TERMINATION

A. The site is eligible for termination when either of the following conditions have been met:

   1. The site has undergone final stabilization, all temporary BMPs have been removed, and all stormwater discharges associated with construction activity have been eliminated; or

   2. All portions of the site which have not undergone final stabilization per S10.A.1 have been sold and/or transferred (per Condition G9), and the Permittee no longer has operational control of the construction activity.

B. When the site is eligible for termination, the Permittee shall submit a complete and accurate *Notice of Termination* (NOT) form, signed in accordance with General Condition G2, to:

   Department of Ecology
   Water Quality Program - Construction Stormwater
   PO Box 47696
   Olympia, Washington 98504-7696

C. The termination is effective on the date the NOT form was received by Ecology, unless the Permittee is notified by Ecology within 30 days that termination request is denied because the eligibility requirements in Condition S10.A have not been met.

GENERAL CONDITIONS

G1. DISCHARGE VIOLATIONS

All discharges and activities authorized by this general permit shall be consistent with the terms and conditions of this general permit. Any discharge of any pollutant more frequent than or at a level in excess of that identified and authorized by the general permit shall constitute a violation of the terms and conditions of this permit.

G2. SIGNATORY REQUIREMENTS

A. All permit applications shall bear a certification of correctness to be signed:

1. In the case of corporations, by a responsible corporate officer of at least the level of vice president of a corporation;

2. In the case of a partnership, by a general partner of a partnership;

3. In the case of sole proprietorship, by the proprietor; or

4. In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

B. All reports required by this permit and other information requested by Ecology shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to the Ecology.

2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.

C. Changes to authorization. If an authorization under paragraph G2.B.2 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph G2.B.2 above shall be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G3. RIGHT OF INSPECTION AND ENTRY

The Permittee shall allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

A. To enter upon the premises where a discharge is located or where any records shall be kept under the terms and conditions of this permit.

B. To have access to and copy - at reasonable times and at reasonable cost - any records required to be kept under the terms and conditions of this permit.

C. To inspect - at reasonable times - any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.

D. To sample or monitor - at reasonable times - any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G4. GENERAL PERMIT MODIFICATION AND REVOCATION

This permit may be modified, revoked and reissued, or terminated in accordance with the provisions of Chapter 173-226 WAC. Grounds for modification, revocation and reissuance, or termination include, but are not limited to, the following:

A. When a change which occurs in the technology or practices for control or abatement of pollutants applicable to the category of dischargers covered under this permit;

B. When effluent limitation guidelines or standards are promulgated pursuant to the CWA or Chapter 90.48 RCW, for the category of dischargers covered under this permit;

C. When a water quality management plan containing requirements applicable to the category of dischargers covered under this permit is approved; or

D. When information is obtained which indicates that cumulative effects on the environment from dischargers covered under this permit are unacceptable.

G5. REVOCATION OF COVERAGE UNDER THE PERMIT

Pursuant with Chapter 43.21B RCW and Chapter 173-226 WAC, the Director may terminate coverage for any discharger under this permit for cause. Cases where coverage may be terminated include, but are not limited to, the following:

A. Violation of any term or condition of this permit;

B. Obtaining coverage under this permit by misrepresentation or failure to disclose fully all relevant facts;

C. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge;

D. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090;

E. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations;

F. Nonpayment of permit fees or penalties assessed pursuant to RCW 90.48.465 and Chapter 173-224 WAC;

G. Failure of the Permittee to satisfy the public notice requirements of WAC 173-226-130(5), when applicable.

The Director may require any discharger under this permit to apply for and obtain coverage under an individual permit or another more specific general permit. Permittees who have their coverage revoked for cause according to WAC 173-226-240 may request temporary coverage under this permit during the time an individual permit is being developed, provided the request is made within ninety (90) days from the time of revocation and is submitted along with a complete individual permit application form.

G6. REPORTING A CAUSE FOR MODIFICATION

The Permittee shall submit a new application, or a supplement to the previous application, whenever a material change to the construction activity or in the quantity or type of discharge is anticipated which is not specifically authorized by this permit. This application shall be submitted at least sixty (60) days prior to any proposed changes. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not relieve the Permittee of the duty to comply with the existing permit until it is modified or reissued.

G7. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit shall be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G8. DUTY TO REAPPLY

The Permittee shall apply for permit renewal at least 180 days prior to the specified expiration date of this permit.

G9. TRANSFER OF GENERAL PERMIT COVERAGE

Coverage under this general permit is automatically transferred to a new discharger, including operators of lots/parcels within a common plan of development or sale, if:

A. A written, signed agreement (Transfer of Coverage Form) between the current discharger (Permittee) and new discharger containing a specific date for transfer of permit responsibility, coverage, and liability is submitted to the Director; and

B. The Director does not notify the current discharger and new discharger of the Director's intent to revoke coverage under the general permit. If this notice is not given, the transfer is effective on the date specified in the written agreement.

When a current discharger (Permittee) transfers <u>a portion</u> of a permitted site, the current discharger shall also submit an updated application form (NOI) to the Director indicating the remaining permitted acreage after the transfer. When a current discharger (Permittee) transfers <u>all portions</u> of a permitted site to one or more new dischargers, the current discharger shall also submit a notice of termination (NOT) form to the Director.

G10. REMOVED SUBSTANCES

Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of stormwater shall not be resuspended or reintroduced to the final effluent stream for discharge to state waters.

G11. DUTY TO PROVIDE INFORMATION

The Permittee shall submit to Ecology, within a reasonable time, all information which Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee shall also submit to Ecology upon request, copies of records required to be kept by this permit [40 CFR 122.41(h)].

G12. OTHER REQUIREMENTS OF 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G13. ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G14. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit shall be deemed guilty of a crime, and upon conviction thereof shall be punished by a fine of up to ten thousand dollars ($10,000) and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit shall incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars ($10,000) for every such violation. Each and every such violation shall be a separate and distinct offense, and in case of a continuing violation, every day's continuance shall be deemed to be a separate and distinct violation.

G15. UPSET

Definition – "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that: 1) an upset occurred and that the Permittee can identify the cause(s) of the upset; 2) the permitted facility was being properly operated at the time of the upset; 3) the Permittee submitted notice of the upset as required in condition S5.F; and 4) the Permittee complied with any remedial measures required under this permit.

In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G16. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G17. DUTY TO COMPLY

The Permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G18. TOXIC POLLUTANTS

The Permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G19. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this Condition, punishment shall be a fine of not more than $20,000 per day of violation, or imprisonment of not more than four (4) years, or both.

G20. REPORTING PLANNED CHANGES

The Permittee shall, as soon as possible, give notice to Ecology of planned physical alterations, modifications or additions to the permitted construction activity, which will result in:

A. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b);

B. A significant change in the nature or an increase in quantity of pollutants discharged, including but not limited to: for sites 5 acres or larger, a 20% or greater increase in acreage disturbed by construction activity;

C. A change in or addition of surface water(s) receiving stormwater or non-stormwater from the construction activity; or

D. A change in the construction plans and/or activity that affects the Permittee's monitoring requirements in Special Condition S4.

Following such notice, permit coverage may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G21. REPORTING OTHER INFORMATION

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to Ecology, it shall promptly submit such facts or information.

G22. REPORTING ANTICIPATED NON-COMPLIANCE

The Permittee shall give advance notice to Ecology by submission of a new application or supplement thereto at least forty-five (45) days prior to commencement of such discharges, of any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility or activity which may result in noncompliance with permit limits or conditions. Any maintenance of facilities, which might necessitate unavoidable interruption of operation and degradation of effluent quality, shall be scheduled during non-critical water quality periods and carried out in a manner approved by Ecology.

G23. REQUESTS TO BE EXCLUDED FROM COVERAGE UNDER THE PERMIT

Any discharger authorized by this permit may request to be excluded from coverage under the general permit by applying for an individual permit. The discharger shall submit to the Director an application as described in WAC 173-220-040 or WAC 173-216-070, whichever is applicable, with reasons supporting the request. These reasons shall fully document how an individual permit will apply to the applicant in a way that the general permit cannot. Ecology may make specific requests for information to support the request. The Director shall either issue an individual permit or deny the request with a statement explaining the reason for the denial. When an individual permit is issued to a discharger otherwise subject to the construction stormwater general permit, the applicability of the construction stormwater general permit to that Permittee is automatically terminated on the effective date of the individual permit.

G24. APPEALS

A. The terms and conditions of this general permit, as they apply to the appropriate class of dischargers, are subject to appeal by any person within 30 days of issuance of this general permit, in accordance with Chapter 43.21B RCW, and Chapter 173-226 WAC.

B. The terms and conditions of this general permit, as they apply to an individual discharger, are appealable in accordance with Chapter 43.21B RCW within 30 days of the effective date of coverage of that discharger. Consideration of an appeal of general permit coverage of an individual discharger is limited to the general permit's applicability or nonapplicability to that individual discharger.

C. The appeal of general permit coverage of an individual discharger does not affect any other dischargers covered under this general permit. If the terms and conditions of this general permit are found to be inapplicable to any individual discharger(s), the matter shall be remanded to Ecology for consideration of issuance of an individual permit or permits.

G25. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

G26. BYPASS PROHIBITED

A. <u>Bypass Procedures</u>
Bypass, which is the intentional diversion of waste streams from any portion of a treatment facility, is prohibited for stormwater events below the design criteria for

stormwater management. Ecology may take enforcement action against a Permittee for bypass unless one of the following circumstances (1, 2, 3 or 4) is applicable.

1. Bypass of stormwater is consistent with the design criteria and part of an approved management practice in the applicable stormwater management manual.

2. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

   Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limitations or other conditions of this permit, or adversely impact public health.

3. Bypass of stormwater is unavoidable, unanticipated, and results in noncompliance of this permit.

   This bypass is permitted only if:

   a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass;

   b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, maintenance during normal periods of equipment downtime (but not if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance), or transport of untreated wastes to another treatment facility; and

   c. Ecology is properly notified of the bypass as required in Special Condition S5.F of this permit.

4. A planned action that would cause bypass of stormwater and has the potential to result in noncompliance of this permit during a storm event.

   The Permittee shall notify Ecology at least thirty (30) days before the planned date of bypass. The notice shall contain:

   a. a description of the bypass and its cause;

   b. an analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing;

   c. a cost-effectiveness analysis of alternatives including comparative resource damage assessment;

   d. the minimum and maximum duration of bypass under each alternative;

   e. a recommendation as to the preferred alternative for conducting the bypass;

f. the projected date of bypass initiation;

g. a statement of compliance with *SEPA*;

h. a request for modification of water quality standards as provided for in WAC 173-201A-110, if an exceedance of any water quality standard is anticipated; and

i. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

5. For probable construction bypasses, the need to bypass is to be identified as early in the planning process as possible. The analysis required above shall be considered during preparation of the Stormwater Pollution Prevention Plan (SWPPP) and shall be included to the extent practical. In cases where the probable need to bypass is determined early, continued analysis is necessary up to and including the construction period in an effort to minimize or eliminate the bypass.

   Ecology will consider the following prior to issuing an administrative order for this type bypass:

   a. If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.

   b. If there are feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.

   c. If the bypass is planned and scheduled to minimize adverse effects on the public and the environment.

   After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve, conditionally approve, or deny the request. The public shall be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Approval of a request to bypass will be by administrative order issued by Ecology under RCW 90.48.120.

B. Duty to Mitigate
The Permittee is required to take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

APPENDIX A – DEFINITIONS

AKART is an acronym for "all known, available, and reasonable methods of prevention, control, and treatment." AKART represents the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants and controlling pollution associated with a discharge.

Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which has been completed and approved by EPA prior to November 16, 2005, or prior to the date the operator's complete permit application is received by Ecology, whichever is later.

Applicant means an *operator* seeking coverage under this permit.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: stormwater associated with construction activity, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Buffer means an area designated by a local jurisdiction that is contiguous to and intended to protect a sensitive area

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

Calendar Week (same as *Week*) means a period of seven consecutive days starting on Sunday.

Certified Erosion and Sediment Control Lead (CESCL) means a person who has current certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology (see BMP C160 in the SWMM).

Clean Water Act (CWA) means the Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, and 97-117; USC 1251 et seq.

Combined Sewer means a sewer which has been designed to serve as a sanitary sewer and a storm sewer, and into which inflow is allowed by local ordinance.

Common plan of development or sale means a site where multiple separate and distinct construction activities may be taking place at different times on different schedules, but still under a single plan. Examples include: 1) phased projects and projects with multiple filings or lots, even if the separate phases or filings/lots will be constructed under separate contract or by separate owners (e.g., a development where lots are sold to separate builders); 2) a development plan that may be phased over multiple years, but is still under a consistent plan for long-term development; and 3) projects in a contiguous area that may be unrelated but still under the same contract, such as construction of a building extension and a new parking lot at the same facility.

If the project is part of a common plan of development or sale, the disturbed area of the entire plan shall be used in determining permit requirements.

Composite Sample A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increases while maintaining a constant time interval between the aliquots.

Construction Activity means land disturbing operations including clearing, grading or excavation which disturbs the surface of the land. Such activities may include road construction, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Demonstrably Equivalent means that the technical basis for the selection of all stormwater BMPs is documented within a SWPPP, including:

1. The method and reasons for choosing the stormwater BMPs selected;
2. The pollutant removal performance expected from the BMPs selected;
3. The technical basis supporting the performance claims for the BMPs selected, including any available data concerning field performance of the BMPs selected;
4. An assessment of how the selected BMPs will comply with state water quality standards; and
5. An assessment of how the selected BMPs will satisfy both applicable federal technology-based treatment requirements and state requirements to use all known, available, and reasonable methods of prevention, control, and treatment (AKART).

Department means the Washington State Department of Ecology.

Detention means the temporary storage of stormwater to improve quality and/or to reduce the mass flow rate of discharge.

De-watering means the act of pumping ground water or stormwater away from an active construction site.

Director means the Director of the Washington Department of Ecology or his/her authorized representative.

Discharger means an owner or operator of any facility or activity subject to regulation under Chapter 90.48 RCW or the Federal Clean Water Act.

Domestic Wastewater means water carrying human wastes, including kitchen, bath, and laundry wastes from residences, buildings, industrial establishments, or other places, together with such ground water infiltration or surface waters as may be present.

Engineered soils The use of soil amendments including, but not limited, to Portland cement treated base (CTB), cement kiln dust (CKD), or fly ash to achieve certain desirable soil characteristics.

Equivalent BMPs means operational, source control, treatment, or innovative BMPs which result in equal or better quality of stormwater discharge to surface water or to ground water than BMPs selected from the SWMM.

Erosion means the wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep.

Erosion and Sediment Control BMPs means BMPs that are intended to prevent erosion and sedimentation, such as preserving natural vegetation, seeding, mulching and matting, plastic covering, filter fences, sediment traps, and ponds. Erosion and sediment control BMPs are synonymous with stabilization and structural BMPs.

Final Stabilization (same as *fully stabilized* or *full stabilization*) means the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as riprap, gabions or geotextiles) which prevents erosion.

Ground Water means water in a saturated zone or stratum beneath the land surface or a surface water body.

Injection well means a "well" that is used for the subsurface emplacement of fluids. (see *Well*)

Jurisdiction means a political unit such as a city, town or county; incorporated for local self-government.

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the state from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington Department of Ecology.

Notice of Intent (NOI) means the application for, or a request for coverage under this general permit pursuant to WAC 173-226-200.

Notice of Termination (NOT) means a request for termination of coverage under this general permit as specified by Special Condition S10 of this permit.

Operator means any party associated with a construction project that meets either of the following two criteria:
1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or

2. The party has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

Outfall means the location where stormwater leaves the site. It also includes the location where stormwater is discharged to a surface waterbody within a site, but does not include discharges to on-site stormwater treatment/infiltration devices or storm sewer systems.

Permittee means individual or entity that receives notice of coverage under this general permit.

pH means a liquid's acidity or alkalinity. A pH of 7 is defined as neutral. Large variations above or below this value are considered harmful to most aquatic life.

pH Monitoring Period means the time period in which the pH of stormwater runoff from a site shall be tested a minimum of once every seven days to determine if stormwater is above pH 8.5.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, and container from which pollutants are or may be discharged to surface waters of the state. This term does not include return flows from irrigated agriculture. (See Fact Sheet for further explanation.)

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, domestic sewage sludge (biosolids), munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste. This term does not include sewage from vessels within the meaning of section 312 of the CWA, nor does it include dredged or fill material discharged in accordance with a permit issued under section 404 of the CWA.

Pollution means contamination or other alteration of the physical, chemical, or biological properties of waters of the state; including change in temperature, taste, color, turbidity, or odor of the waters; or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the state as will or is likely to create a nuisance or render such waters harmful, detrimental or injurious to the public health, safety or welfare; or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or to livestock, wild animals, birds, fish or other aquatic life.

Receiving Water means the waterbody at the point of discharge. If the discharge is to a storm sewer system, either surface or subsurface, the receiving water is the waterbody that the storm sewer system discharges to. Systems designed primarily for other purposes such as for ground water drainage, redirecting stream natural flows, or for conveyance of irrigation water/return flows that coincidentally convey stormwater are considered the receiving water.

Representative means a stormwater or wastewater sample which represents the flow and characteristics of the discharge. Representative samples may be a grab sample, a time-proportionate *composite sample*, or a flow proportionate sample. Ecology's Construction Stormwater Monitoring Manual provides guidance on representative sampling.

Sanitary Sewer means a sewer which is designed to convey *domestic wastewater.*

Sediment means the fragmented material that originates from the weathering and erosion of rocks or unconsolidated deposits, and is transported by, suspended in, or deposited by water.

Sedimentation means the depositing or formation of sediment.

Sensitive area means a waterbody, wetland, stream, aquifer recharge area, or channel migration zone.

SEPA (State Environmental Policy Act) means the Washington State Law, RCW 43.21C.020, intended to prevent or eliminate damage to the environment.

Significant Amount means an amount of a pollutant in a discharge that is amenable to available and reasonable methods of prevention or treatment; or an amount of a pollutant that has a reasonable potential to cause a violation of surface or ground water quality or sediment management standards.

Significant Concrete Work means greater than 1000 cubic yards poured concrete or recycled concrete.

Significant Contributor of Pollutants means a facility determined by Ecology to be a contributor of a *significant amount*(s) of a pollutant(s) to waters of the state of Washington.

Site means the land or water area where any "facility or activity" is physically located or conducted.

Source Control BMPs means physical, structural or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater. A few examples of source control BMPs are erosion control practices, maintenance of stormwater facilities, constructing roofs over storage and working areas, and directing wash water and similar discharges to the sanitary sewer or a dead end sump.

Stabilization means the application of appropriate BMPs to prevent the erosion of soils, such as, temporary and permanent seeding, vegetative covers, mulching and matting, plastic covering and sodding. See also the definition of Erosion and Sediment Control BMPs.

Storm Drain means any drain which drains directly into a *storm sewer system*, usually found along roadways or in parking lots.

Storm Sewer System means a means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains designed or used for collecting or conveying stormwater. This does not include systems which are part of a *combined sewer* or Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

Stormwater means that portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body, or a constructed infiltration facility.

Stormwater Management Manual (SWMM) or Manual means the technical manual published by Ecology for use by local governments that contain descriptions of and design criteria for BMPs to prevent, control, or treat pollutants in stormwater.

Stormwater Pollution Prevention Plan (SWPPP) means a documented plan to implement measures to identify, prevent, and control the contamination of point source discharges of stormwater.

Surface Waters of the State includes lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Total Maximum Daily Load (TMDL) means a calculation of the maximum amount of a *pollutant* that a waterbody can receive and still meet state water quality standards. Percentages of the total maximum daily load are allocated to the various pollutant sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The TMDL calculations shall include a "margin of safety" to ensure that the waterbody can be protected in case there are unforeseen events or unknown sources of the pollutant. The calculation shall also account for seasonable variation in water quality.

Treatment BMPs means BMPs that are intended to remove pollutants from stormwater. A few examples of treatment BMPs are detention ponds, oil/water separators, biofiltration, and constructed wetlands.

Transparency means a measurement of water clarity in centimeters (cm), using a 60 cm. transparency tube. The transparency tube is used to estimate the relative clarity or transparency of water by noting the depth at which a black and white Secchi disc becomes visible when water is released from a value in the bottom of the tube. A transparency tube is sometimes referred to as a "turbidity tube".

Turbidity The clarity of water expressed as nephelometric turbidity units (NTU) and measured with a calibrated turbidimeter.

Waste Load Allocation (WLA) means the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality based effluent limitation (40 CFR 130.2(h)).

Water Quality means the chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose.

Waters of the State includes those waters as defined as "waters of the United States" in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and "waters of the state" as defined in Chapter 90.48 RCW which include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Well means a bored, drilled or driven shaft, or dug hole whose depth is greater than the largest surface dimension. (see *Injection Well*)

APPENDIX B – ACRONYMS

AKART	All Known, Available, and Reasonable Methods of Prevention, Control, and Treatment
BMP	Best Management Practice
CESCL	Certified Erosion and Sediment Control Lead
CFR	Code of Federal Regulations
CKD	Cement Kiln Dust
cm	Centimeters
CTB	Cement Treated Base
CWA	Clean Water Act
DMR	Discharge Monitoring Report
EPA	Environmental Protection Agency
ESC	Erosion and Sediment Control
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SWMM	Stormwater Management Manual
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
UIC	Underground Injection Control
USC	United States Code
USEPA	United States Environmental Protection Agency
WAC	Washington Administrative Code
WQ	Water Quality
WWHM	Western Washington Hydrology Model

APPENDIX I

JULY 2009 SUPPLEMENTAL SOIL SAMPLING
FORMER SCOTT PAPER MILL SITE – MJB NORTH AREA

APPENDIX I

JULY 2009 SUPPLEMENTAL SOIL SAMPLING
FORMER SCOTT PAPER MILL SITE - MJB NORTH AREA

INTRODUCTION

On July 22, 2009 Anchor QEA, LLC performed supplemental field screening and soil sampling to refine the preliminary remedial excavation area limits identified in the Cleanup Action Plan. The purpose of the sampling event was to collect additional information prior completion of the design so that remedial excavation areas could be better refined. Field screening was used to provide an order of magnitude estimate of the presence of Site metals of concern, while laboratory analytical data was used to confirm the presence or absence of Site metals of concern in target areas screened by visual observations. This appendix provides a summary of those activities, as well as, the results of the field screening and analytical testing. This appendix also documents the Toxicity Characteristic Leaching Procedure (TCLP) testing performed to characterize the Phase 4A soil for disposal.

SAMPLING LOCATIONS

Nine test pit locations were excavated adjacent to the preliminary remedial excavation areas just south of the construction haul road (as shown on Figure I-1). Tests pits were excavated at each location until the base of the gravel fill was identified. Each test pit was nominally 3 feet wide by 5 feet long and ranged in depth from 12 to 30 inches. Field logs were prepared for each test pit location and are attached to this appendix. Composite samples were collected for laboratory analytical analysis from eight of the nine stockpile locations. The fill material encountered consisted of dense, sandy gravel and cobbles with some fraction of silt. Composite samples submittal for laboratory analyses were taken from the finer fraction of the fill material in accordance with WAC 173-340-740(7)(a). After field screening was performed and composite samples were collected from the stockpiles, each test pit was backfilled to the original grade. No excess material was generated; therefore, off-site disposal was not required.

FIELD SCREENING EQUIPMENT

An Innov-X Systems Alpha Series™ X-ray fluorescence spectrometer (XRF) was used to provide a screening-level characterization of the soils located at the base and sides of each test pit. The unit is capable of providing results with detection limits between 10 and 100 milligrams per kilogram (mg/kg) for most metals and the average reported detection limit for the field event was 10.8 mg/kg for arsenic. Detection limits for other metals were below Site specific cleanup levels, except for total chromium with an average detection limit of 252 mg/kg (above the total chromium cleanup level of 117 mg/kg). Prior to use, the system was standardized in accordance with the manufacturer's procedures. During testing, the XRF was held firmly against soil for a minimum of 30 seconds until data was recorded as automatically noted on the device interface. XRF readings were collected from the surface of the fill after the upper 1 to 2-inch layer of crushed stone was removed, from the sidewall of the test pit excavation, and from the base of the excavation at the contact between the gray, gravel/cobble fill material and the underlying brown, gravelly soil.

XRF SCREENING RESULTS

The XRF field screening results for arsenic are summarized in Table I-1. The XRF is not able to reliably detect concentrations of total chromium or zinc below Site cleanup levels and these data were omitted from Table I-1 as they likely represent false exceedances. The remaining metals of concern identified in the Cleanup Action Plan (antimony, copper, lead, mercury, nickel, and thallium) were measured; however, they were not present in concentrations above the Site cleanup levels. These results were used to provide an order of magnitude estimate of the presence of Site metals of concern; laboratory analytical results were used to refine the lateral extent of contamination.

LABORATORY ANALYTICAL RESULTS

Eight composite samples were submitted to Analytical Resources, Incorporated (ARI), located in Tukwila, Washington on July 23, 2009. The results of analysis are summarized in Table I-2. Composite samples were collected from various locations within the material temporarily stockpiled from the test pit excavations. Samples were collected from each of the test pit locations with the exception of KC-TP07 as XRF screening indicated the area was below Site cleanup levels and in agreement with previous limits of impacted soils. Of the samples submitted for analysis, five contained concentrations of arsenic above Site cleanup levels and two contained elevated concentrations of zinc. Only two samples collected from outside of the preliminary remedial excavation areas, KC-TP04-SO and KC-TP05-SO, exceeded Site cleanup levels. Concentrations of metals in samples KC-TP06-SO, KC-TP08-SO, and KC-TP09-SO were all below Site cleanup levels.

TCLP testing was also performed on 3 samples characteristic of the material to be disposed as part of the Phase 4A cleanup activities. Each sample was analyzed for arsenic, chromium, and lead per the direction of the proposed landfill facilities. These samples were analyzed by ARI on October 12, 2009 from archives of test pit samples KC-TP01-SO, KC-TP02-SO, and KC-TP03-SO. All results were below the maximum contaminant concentrations for toxicity characteristics and therefore, classify as Subtitle D (solid) waste.

Table I-1
XRF Field Screening Results for Select Metals

Test Pit Location	Sample Type	Sample Depth	Arsenic (mg/kg)
SS3[1]	Surface	2"	29 (+/- 8)
SS3	Surface	3"	<LOD (14)
SS3	Stockpile	0" – 12"	56 (+/- 8)
KC-TP01	Surface	1"	79 (+/- 8)
KC-TP01	Sidewall	6"	63 (+/- 9)
KC-TP01	Base	12"	<LOD (12)
KC-TP02	Surface	1"	86 (+/- 10)
KC-TP02	Sidewall	6"	<LOD (19)
KC-TP02	Base	12"	<LOD (11)
KC-TP03	Surface	1"	28 (+/- 5)
KC-TP03	Sidewall	7"	42 (+/- 7)
KC-TP03	Base	15"	12 (+/- 4)
KC-TP04	Surface	1"	47 (+/- 7)
KC-TP04	Sidewall	6"	23 (+/- 5)
KC-TP04	Base	12"	<LOD (10)
KC-TP05	Surface	1"	55 (+/- 8)
KC-TP05	Sidewall	7"	<LOD (14)
KC-TP05	Base	15"	14 (+/- 4)
KC-TP05	Sidewall	7"	32 (+/- 6)
KC-TP06	Surface	1"	<LOD (12)
KC-TP06	Sidewall	7"	32 (+/- 9)
KC-TP06	Base	12"	<LOD (15)
KC-TP06	Sidewall	7"	<LOD (18)
KC-TP07	Surface	1"	<LOD (17)
KC-TP07	Sidewall	9"	<LOD (15)
KC-TP07	Base	18"	<LOD (11)
KC-TP08	Surface	1"	26 (+/- 6)
KC-TP08	Sidewall	6"	<LOD (15)
KC-TP08	Base	12"	<LOD (11)
KC-TP09	Sidewall	15'	<LOD (14)
KC-TP09	Sidewall	15"	<LOD (20)
KC-TP09	Base	30"	<LOD (15)

Notes:
1. Located at previous sample location reported in the Remedial Investigation

<LOD (##) = Compound analyzed, but not detected above detection limit reported in parentheses.

Table I-2
Analytical Sampling of Test Pit Stockpiles

	Cleanup Level	KC-TP01-SO	KC-TP02-SO	KC-TP03-SO	KC-TP04-SO	KC-TP05-SO	KC-TP06-SO	KC-TP08-SO	KC-TP09-SO
Metals (mg/kg)									
Antimony	32	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Arsenic	20	**130**	**160**	**40**	**40**	**40**	**20**	**20**	**10**
Chromium	117	**103**	**70**	**58**	**95**	**60**	**76**	**55**	**51**
Copper	366	**274**	**324**	**149**	**134**	**166**	**116**	**114**	**96.1**
Lead	220	**95**	**108**	**30**	**31**	**32**	**36**	**18**	**12**
Mercury	9	**0.24**	**0.22**	**0.4**	**0.18**	**0.29**	**0.26**	**0.29**	**0.43**
Nickel	977	**74**	**57**	**56**	**69**	**59**	**72**	**55**	**48**
Thallium	5.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Zinc	662	**1660**	**1240**	**411**	**411**	**464**	**237**	**200**	**138**

Notes:
Bold = Detected result
U = Compound analyzed, but not detected above detection limit
Highlight = Results above cleanup level

Table I-3
TCLP Results Summary

	TCLP Regulatory Limit	KC-TP01-SO	KC-TP02-SO	KC-TP03-SO
Metals (mg/L)				
Arsenic	5	0.2 U	0.2 U	0.2 U
Chromium	5	0.02 U	0.02 U	0.02 U
Lead	5	0.1 U	0.1 U	0.1 U

Notes:
U = Compound analyzed, but not detected above detection limit

ANCHOR QEA

Figure I-1
MJB North Area Phase 4 Supplemental Data
Anacortes, Washington

APPENDIX I

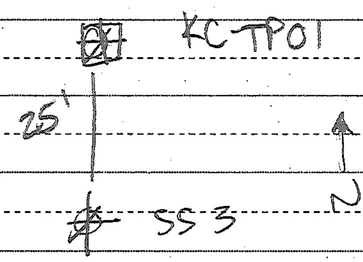
ATTACHMENT I-1: FIELD DOCUMENTATION, LABORATORY DATA REPORTS, AND DATA VALIDATION REPORT

TEST PIT LOG

ANCHOR ENVIRONMENTAL, L.L.C.

TP #	KC-TP01	Field Representative	JPL/RD
Project	FORMER SCOTT MILL ANACORTES	Date	7/22/09
Location	MJB SITE	Ground Surface El.	
		Time	1115
		Water El.	—
		Job Number	000105-01

Sample No.	Depth	Soil Type	Geologic Description
	IN		DENSE, DRY, RED GRAY, SL SILTY SL SANDY GRAVEL (GW) AND COBBLES
	6		As = 79 ± 8 ppm XRF AT SURFACE 63±9 AT SIDEWALL (TEST #7)
	12		M. DENSE, DAMP, BROWN SANDY GRAVEL
	18		As = ND <12ppm (TEST #8
	24		
			BOTTOM OF HOLE AT 1 FT DEEP 7/22/09



Notes

Sample KC-TP01-SO collected from stockpile @ 14:35.

TEST PIT LOG

ANCHOR ENVIRONMENTAL, L.L.C.

TP # KC-TP02

Project FORMER SCOTT MILL

Location MJB SITE

Field Representative JPL/RD

Ground Surface El.

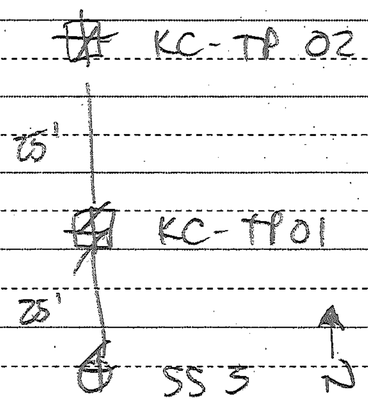
Water El. —

Date 7/22/09

Time 1125

Job Number 000105-01

Sample No.	Depth	Soil Type	Geologic Description
	IN		DENSE, DRY, RED GRAY SL SANDY GRAVEL & COBBLE FILL (GW)
	6		
			As = 86 ± 10 @ Surface (Reading #9), As = ND <19 in sidewall (#10)
	12		M. DENSE, DAMP, BROWN, SILTY SANDY GRAVEL
	18		As = ND <11 ppm (Reading #11)
			BOTTOM OF HOLE AT 12"
			7/22/09



Notes

Sample KC-TP02-SO collected from stockpile @ 14:40

TEST PIT LOG

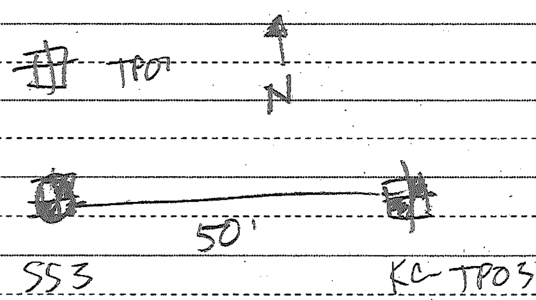
ANCHOR ENVIRONMENTAL, L.L.C.

TP # KC-TP03
Project FORMER SCOTT MILL ANACORTES
Location MJB SITE

Field Representative JPL/RD
Ground Surface El.
Water El. —

Date 7/22/09
Time 1138
Job Number 000105-01

Sample No.	Depth	Soil Type	Geologic Description
	in		DENSE, DRY, RED/GRAY SL. SILTY SANDY GRAVEL & COBBLE FILL (GW)
	6		$As = 28 \pm 5$ ppm AT SURFACE (#12) $As = 42 \pm 7$ SIDEWALL (#13)
	12		
15"			
	18		M. DENSE, DAMP, BROWN SL. SILTY SANDY GRAVEL
			$As = 12 \pm 4$ ppm (READING # 14)
			BOTTOM OF HOLE AT 15" 7/22/09



Notes

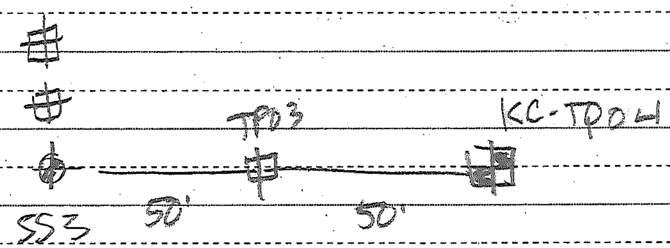
Sample KC-TP03-SO collected from stockpile @ 14:45

TEST PIT LOG

ANCHOR ENVIRONMENTAL, L.L.C.

TP #	KC-TP04	Field Representative	JPL / RD	Date	7/22/09
Project	FORMER SCOTT MILL	Ground Surface El.		Time	1145
Location	MJB SITE	Water El.	—	Job Number	000105-08

Sample No.	Depth	Soil Type	Geologic Description
	0"		DENSE, DRY, RED GRAY SANDY GRAVEL (FEW COBBLES) (GW)
	6		As = 47 ± 7 (Readin #15) AT SURFACE 23 ± 5 ppm sidewall (#16)
	12		M-DENSE, MOIST BROWN SAND
	18		As = ND <10 ppm (#17)
	24		
	30		
	36		



Notes

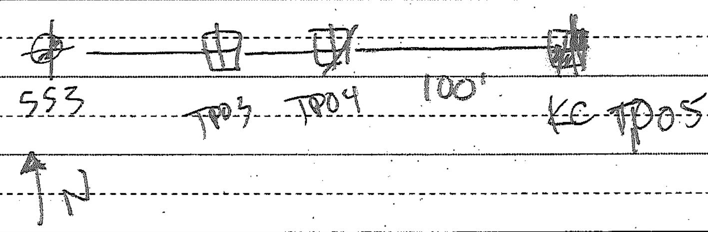
Sample KC-TP04-SO collected from stockpile @ 14:52

TEST PIT LOG

ANCHOR ENVIRONMENTAL, L.L.C.

TP #	KC - TP05	Field Representative	JRL / RD
Project	FORMER SCOTT MILL	Date	7/22/09
Location	MJB SITE	Time	1200
Ground Surface El.		Job Number	000105-01
Water El.	—		

Sample No.	Depth	Soil Type	Geologic Description
	1N		DENSE, DRY, GRAY SL SILTY SL SANDY GRAVEL & COBBLE (GW)
	6		
			As = 55 ± 8 ppm SURFACE (#18) SIDEWALL ND <14 (#19)
	12		32 ± 6 SIDEWALL (#21)
			M. DENSE, MOIST, BROWN SILTY SAND FILL
	18		
			As = 14 ± 4 PPM (#20)
	24		
			BOTTOM OF HOLE AT 15" 7/22/09



Notes

Sample KC-TP05-SO collected from stockpile @ 14:55

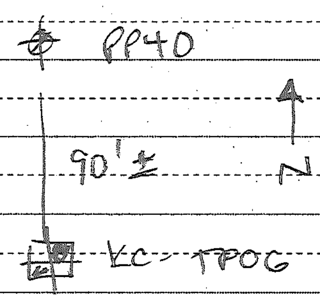
LAB

TEST PIT LOG

ANCHOR ENVIRONMENTAL, L.L.C.

TP #	KC-TP06	Field Representative	JPL/KD	Date	7/22/09
Project	FORMER SCOTT MILL ANACORTES	Ground Surface El.		Time	1205
Location	MJB SITE	Water El.	—	Job Number	000105-01

Sample No.	Depth	Soil Type	Geologic Description
			DENSE, DRY TAN AND GRAY SL. SILTY SANDY GRAVEL & COBBLE
	6		(GW) FILL
			SURFACE As = ND<12ppm (#22) SIDEWALL = 32±9 (#23)
	12		
			DENSE, DRY, GRAY & WHITE SL SANDY GRAVEL & COBBLE
	18		(GW) FILL
	24		As = ND < 15ppm (# 24)



Notes

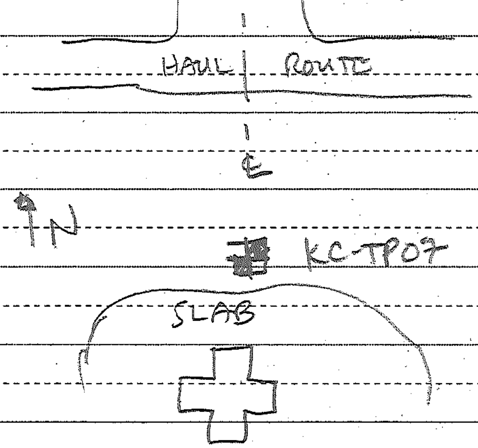
Sample KC-TP06-SO collected from stockpile @ 14:58

TEST PIT LOG

ANCHOR ENVIRONMENTAL, L.L.C.

TP #	KC-TP07	Field Representative	JPL/RD	Date	7/22/09
Project	FORMER SCOTT MILL	Ground Surface El.		Time	1220
Location	MJB SITE	Water El.	——	Job Number	

Sample No.	Depth	Soil Type	Geologic Description
	IN		DENSE, DRY, GRAY SL. SILTY SANDY GRAVEL & COBBLE (GW)
	6		SURFACE = ND < 17ppm As (# 26)
			SIDEWALL = ND < 15 ppm As (# 27)
	12		
	18		
			M. DENSE, DAMP, BROWN SILTY SAND & GRAVEL (GW)
	24		As ND <11 (# 28)
			BOTTOM OF HOLE AT 18" 7/22/09
			BACKFILLED 1230



Notes

No stockpile sample.

TEST PIT LOG

ANCHOR ENVIRONMENTAL, L.L.C.

TP # KC TP08
Project FORMER SCOTT MILL ANACORTES
Location MJB SITE

Field Representative JPL/RD
Ground Surface El.
Water El. —

Date 7/22/09
Time 1245
Job Number 000105-01

Sample No.	Depth	Soil Type	Geologic Description
	IN		DENSE, GRAY, DRY SAND AND GRAVEL/COBBLE (GW)
	6		
			SURFACE As = 26 ± 6 PPM (#29)
			SIDEWALL As = ND < 15 PPM (#30)
	12		
			DENSE, DAMP, BROWN SAND AND GRAVEL (COBBLE) (GW)
	18		
			As = ND < 11 ppm (#31)
	24		
	30		
	36		
			KC TP08

Notes

Stockpile sample KC-TP08-SO @ 15:03

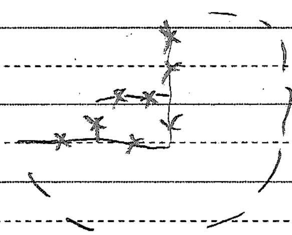
TEST PIT LOG

ANCHOR ENVIRONMENTAL, L.L.C.

TP # KC-TP09
Project FORMER SCOTT MILL ANACORTES
Location MJB SITE

Field Representative JPL/RD
Ground Surface El.
Water El. ——
Date 7/22/09
Time 1300
Job Number 000105-01

Sample No.	Depth	Soil Type	Geologic Description
	IN		VERY DENSE, DRY, BROWN GRAY SILTY SAND, GRAVEL
	6		AND COBBLES (FILL) (GW)
			SIDEWALL SAMPLING (XRF)
	12		
	18		
			#32 As ND < 14 ppm } SIDEWALLS #34 As ND < 15 ppm
	24		#33 As ND < 20 ppm BASE
	30		



KC-TP09

Notes

Stockpile sample KC-TP09-SO @ 15:06

Analytical Resources, Incorporated
Analytical Chemists and Consultants

August 5, 2009

Delaney Peterson
Anchor QEA
1423 3rd Avenue, Suite 300
Seattle, WA 98101

RE: Client Project: Kimberly Clark, 000105-01
ARI Job No.: PH98

Dear Delaney:

Please find enclosed the original Chain-of-Custody record, sample receipt documentation, and the final results for samples from the project referenced above. Eight soil samples were received July 23, 2009. For details regarding sample receipt, please refer to the enclosed Cooler Receipt Form.

The samples were analyzed Total Metals, as requested.

There were no anomalies associated with the analyses of these samples.

An electronic copy of this report and all associated raw data will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager
-For-
Susan Dunnihoo
Director, Client Services
sue@arilabs.com
206-695-6207

Enclosures

cc: eFile PH98

Chain of Custody Record & Laboratory Analysis Request

Page 1 of 1 Turnaround Requested: Std.

Anchor Contact: Joy Danay

ANCHOR ENVIRONMENTAL, L.L.C.
1423 Third Ave, Suite 300
Seattle, WA 98101
Ph: (206) 287-9130 Fax: (206) 287-9131

PH98

Lab Contact: Sue Dunnihoo	Proj. Name: Kimberly Clark
Lab: ARI	Proj. Number: 000105-01
Address: tukwila	Sampler: John Laplante
Phone:	Shipping Method: hand
Fax:	AirBill:

Analyses Requested: metals *; ~~Grain Size~~ DG

Sample ID	Sample Date	Sample Time	Sample Martix	# Containers	metals *	~~Grain Size~~ DG	Notes/ Comments:
KC-TPØ1-SO	7/22	1435	soil	1	X		Please call to Confirm analyses and Archive and TAT
KC-TPØ2-SO	↓	1440	↓	1	X		
KC-TPØ3-SO	↓	1445	↓	1	X		
KC-TPØ4-SO	↓	1452	↓	1	X		
KC-TPØ5-SO	↓	1455	↓	1	X		
KC-TPØ6-SO	↓	1458	↓	1	X		
KC-TPØ8-SO	↓	1503	↓	1	X		
KC-TPØ9-SO	↓	1506	↓	1	X		
~~KC-TPØ1-SO~~	↓	~~1515~~	↓			~~X~~ DG	

* Sb, As, Cr (total), Cu, Pb, Hg, Ni, Tl, Zn.

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
[signature]			
Printed Name: David Gillingham	Printed Name:	Printed Name:	
Company: Anchor	Company:	Company:	
Date/Time: 7/23/09 1300	Date/Time:	Date/Time:	
Received By: [signature]	Received By:	Received By:	
Printed Name: Rich Hudson	Printed Name:	Printed Name:	
Company: ARI	Company:	Company:	# of Coolers: / Cooler Temp(s):
Date/Time: 7/23/09 1315	Date/Time:	Date/Time:	COC Seals Intact? / Bottles Intact?

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Anchor

COC No(s): NA

Assigned ARI Job No: PH98

Project Name: Kimberly Clark

Delivered by: Fed-Ex UPS Courier Hand Delivered Other:

Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)	10.8	

If cooler temperature is out of compliance fill out form 00070F — Temp Gun ID#: 101886

Cooler Accepted by: [signature] Date: 7/23/09 Time: 1435

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other:			
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?	bubble bags	YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO

Samples Logged by: AV Date: 7/23/09 Time: 1728

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm

Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Temperature Compliance Form

Cooler#: 1 Temperature(°C): 10.8

Sample ID	Bottle Count	Bottle Type
KC-TP01-SO	1	1 8oz Jar
KC-TP02-SO	1	"
KC-TP03-SO	1	"
KC-TP04-SO	1	"
KC-TP05-SO	1	"
KC-TP06-SO	1	"
KC-TP08-SO	1	"
KC-TP09-SO	1	"

Cooler#: Temperature(°C):

Sample ID	Bottle Count	Bottle Type

Cooler#: Temperature(°C):

Sample ID	Bottle Count	Bottle Type

Cooler#: Temperature(°C):

Sample ID	Bottle Count	Bottle Type

Completed by: AV Date: 7/23/09 Time: 1726

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: KC-TP01-SO
SAMPLE

Lab Sample ID: PH98A
LIMS ID: 09-17416
Matrix: Soil
Data Release Authorized:
Reported: 08/05/09

QC Report No: PH98-Anchor QEA
Project: KIMBERLY CLARK
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

Percent Total Solids: 99.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/31/09	6010B	08/04/09	7440-36-0	Antimony	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-38-2**	**Arsenic**	10	**130**	
3050B	07/31/09	6010B	08/04/09	**7440-47-3**	**Chromium**	1	**103**	
3050B	07/31/09	6010B	08/04/09	**7440-50-8**	**Copper**	0.5	**274**	
3050B	07/31/09	6010B	08/04/09	**7439-92-1**	**Lead**	5	**95**	
CLP	07/27/09	7471A	07/31/09	**7439-97-6**	**Mercury**	0.02	**0.24**	
3050B	07/31/09	6010B	08/04/09	**7440-02-0**	**Nickel**	2	**74**	
3050B	07/31/09	6010B	08/04/09	7440-28-0	Thallium	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-66-6**	**Zinc**	2	**1,660**	

U-Analyte undetected at given RL
RL-Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: KC-TP02-SO
SAMPLE

Lab Sample ID: PH98B
LIMS ID: 09-17417
Matrix: Soil
Data Release Authorized:
Reported: 08/05/09

QC Report No: PH98-Anchor QEA
Project: KIMBERLY CLARK
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

Percent Total Solids: 99.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/31/09	6010B	08/04/09	7440-36-0	Antimony	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-38-2**	**Arsenic**	10	**160**	
3050B	07/31/09	6010B	08/04/09	**7440-47-3**	**Chromium**	1	**70**	
3050B	07/31/09	6010B	08/04/09	**7440-50-8**	**Copper**	0.5	**324**	
3050B	07/31/09	6010B	08/04/09	**7439-92-1**	**Lead**	5	**108**	
CLP	07/27/09	7471A	07/31/09	**7439-97-6**	**Mercury**	0.02	**0.22**	
3050B	07/31/09	6010B	08/04/09	**7440-02-0**	**Nickel**	2	**57**	
3050B	07/31/09	6010B	08/04/09	7440-28-0	Thallium	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-66-6**	**Zinc**	2	**1,240**	

U-Analyte undetected at given RL
RL-Reporting Limit

FORM-I

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: KC-TP03-SO
SAMPLE

Lab Sample ID: PH98C
LIMS ID: 09-17418
Matrix: Soil
Data Release Authorized:
Reported: 08/05/09

QC Report No: PH98-Anchor QEA
Project: KIMBERLY CLARK
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

Percent Total Solids: 99.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/31/09	6010B	08/04/09	7440-36-0	Antimony	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-38-2**	**Arsenic**	10	**40**	
3050B	07/31/09	6010B	08/04/09	**7440-47-3**	**Chromium**	1	**58**	
3050B	07/31/09	6010B	08/04/09	**7440-50-8**	**Copper**	0.5	**149**	
3050B	07/31/09	6010B	08/04/09	**7439-92-1**	**Lead**	5	**30**	
CLP	07/27/09	7471A	07/31/09	**7439-97-6**	**Mercury**	0.02	**0.40**	
3050B	07/31/09	6010B	08/04/09	**7440-02-0**	**Nickel**	2	**56**	
3050B	07/31/09	6010B	08/04/09	7440-28-0	Thallium	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-66-6**	**Zinc**	2	**411**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: KC-TP04-SO
SAMPLE

Lab Sample ID: PH98D
LIMS ID: 09-17419
Matrix: Soil
Data Release Authorized:
Reported: 08/05/09

QC Report No: PH98-Anchor QEA
Project: KIMBERLY CLARK
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

Percent Total Solids: 99.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/31/09	6010B	08/04/09	7440-36-0	Antimony	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-38-2**	**Arsenic**	10	**40**	
3050B	07/31/09	6010B	08/04/09	**7440-47-3**	**Chromium**	1	**95**	
3050B	07/31/09	6010B	08/04/09	**7440-50-8**	**Copper**	0.5	**134**	
3050B	07/31/09	6010B	08/04/09	**7439-92-1**	**Lead**	5	**31**	
CLP	07/27/09	7471A	07/31/09	**7439-97-6**	**Mercury**	0.02	**0.18**	
3050B	07/31/09	6010B	08/04/09	**7440-02-0**	**Nickel**	2	**69**	
3050B	07/31/09	6010B	08/04/09	7440-28-0	Thallium	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-66-6**	**Zinc**	2	**411**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: KC-TP05-SO
SAMPLE

Lab Sample ID: PH98E
LIMS ID: 09-17420
Matrix: Soil
Data Release Authorized:
Reported: 08/05/09

QC Report No: PH98-Anchor QEA
Project: KIMBERLY CLARK
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

Percent Total Solids: 99.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/31/09	6010B	08/04/09	7440-36-0	Antimony	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-38-2**	**Arsenic**	10	**40**	
3050B	07/31/09	6010B	08/04/09	**7440-47-3**	**Chromium**	1	**60**	
3050B	07/31/09	6010B	08/04/09	**7440-50-8**	**Copper**	0.5	**166**	
3050B	07/31/09	6010B	08/04/09	**7439-92-1**	**Lead**	5	**32**	
CLP	07/27/09	7471A	07/31/09	**7439-97-6**	**Mercury**	0.02	**0.29**	
3050B	07/31/09	6010B	08/04/09	**7440-02-0**	**Nickel**	2	**59**	
3050B	07/31/09	6010B	08/04/09	7440-28-0	Thallium	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-66-6**	**Zinc**	2	**464**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: KC-TP06-SO
SAMPLE

Lab Sample ID: PH98F
LIMS ID: 09-17421
Matrix: Soil
Data Release Authorized
Reported: 08/05/09

QC Report No: PH98-Anchor QEA
Project: KIMBERLY CLARK
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

Percent Total Solids: 99.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/31/09	6010B	08/04/09	7440-36-0	Antimony	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-38-2**	**Arsenic**	10	**20**	
3050B	07/31/09	6010B	08/04/09	**7440-47-3**	**Chromium**	1	**76**	
3050B	07/31/09	6010B	08/04/09	**7440-50-8**	**Copper**	0.5	**116**	
3050B	07/31/09	6010B	08/04/09	**7439-92-1**	**Lead**	5	**36**	
CLP	07/27/09	7471A	07/31/09	**7439-97-6**	**Mercury**	0.02	**0.26**	
3050B	07/31/09	6010B	08/04/09	**7440-02-0**	**Nickel**	2	**72**	
3050B	07/31/09	6010B	08/04/09	7440-28-0	Thallium	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-66-6**	**Zinc**	2	**237**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: KC-TP08-SO
SAMPLE

Lab Sample ID: PH98G
LIMS ID: 09-17422
Matrix: Soil
Data Release Authorized:
Reported: 08/05/09

QC Report No: PH98-Anchor QEA
Project: KIMBERLY CLARK
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

Percent Total Solids: 98.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/31/09	6010B	08/04/09	7440-36-0	Antimony	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-38-2**	**Arsenic**	10	**20**	
3050B	07/31/09	6010B	08/04/09	**7440-47-3**	**Chromium**	1	**55**	
3050B	07/31/09	6010B	08/04/09	**7440-50-8**	**Copper**	0.5	**114**	
3050B	07/31/09	6010B	08/04/09	**7439-92-1**	**Lead**	5	**18**	
CLP	07/27/09	7471A	07/31/09	**7439-97-6**	**Mercury**	0.02	**0.29**	
3050B	07/31/09	6010B	08/04/09	**7440-02-0**	**Nickel**	2	**55**	
3050B	07/31/09	6010B	08/04/09	7440-28-0	Thallium	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-66-6**	**Zinc**	2	**200**	

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

Sample ID: KC-TP09-SO
SAMPLE

Lab Sample ID: PH98H
LIMS ID: 09-17423
Matrix: Soil
Data Release Authorized
Reported: 08/05/09

QC Report No: PH98-Anchor QEA
Project: KIMBERLY CLARK
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

Percent Total Solids: 98.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/31/09	6010B	08/04/09	7440-36-0	Antimony	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-38-2**	**Arsenic**	10	**10**	
3050B	07/31/09	6010B	08/04/09	**7440-47-3**	**Chromium**	1	**51**	
3050B	07/31/09	6010B	08/04/09	**7440-50-8**	**Copper**	0.5	**96.1**	
3050B	07/31/09	6010B	08/04/09	**7439-92-1**	**Lead**	5	**12**	
CLP	07/27/09	7471A	07/31/09	**7439-97-6**	**Mercury**	0.02	**0.43**	
3050B	07/31/09	6010B	08/04/09	**7440-02-0**	**Nickel**	2	**48**	
3050B	07/31/09	6010B	08/04/09	7440-28-0	Thallium	10	10	U
3050B	07/31/09	6010B	08/04/09	**7440-66-6**	**Zinc**	2	**138**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: LAB CONTROL

Lab Sample ID: PH98LCS
LIMS ID: 09-17416
Matrix: Soil
Data Release Authorized
Reported: 08/05/09

QC Report No: PH98-Anchor QEA
Project: KIMBERLY CLARK
000105-01
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Antimony	6010B	205	200	102%	
Arsenic	6010B	218	200	109%	
Chromium	6010B	51.1	50.0	102%	
Copper	6010B	50.6	50.0	101%	
Lead	6010B	204	200	102%	
Mercury	7471A	0.46	0.50	92.0%	
Nickel	6010B	48	50	96.0%	
Thallium	6010B	211	200	106%	
Zinc	6010B	49	50	98.0%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: METHOD BLANK

Lab Sample ID: PH98MB
LIMS ID: 09-17416
Matrix: Soil
Data Release Authorized:
Reported: 08/05/09

QC Report No: PH98-Anchor QEA
Project: KIMBERLY CLARK
000105-01
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/31/09	6010B	08/04/09	7440-36-0	Antimony	5	5	U
3050B	07/31/09	6010B	08/04/09	7440-38-2	Arsenic	5	5	U
3050B	07/31/09	6010B	08/04/09	7440-47-3	Chromium	0.5	0.5	U
3050B	07/31/09	6010B	08/04/09	7440-50-8	Copper	0.2	0.2	U
3050B	07/31/09	6010B	08/04/09	7439-92-1	Lead	2	2	U
CLP	07/27/09	7471A	07/31/09	7439-97-6	Mercury	0.02	0.02	U
3050B	07/31/09	6010B	08/04/09	7440-02-0	Nickel	1	1	U
3050B	07/31/09	6010B	08/04/09	7440-28-0	Thallium	5	5	U
3050B	07/31/09	6010B	08/04/09	7440-66-6	Zinc	1	1	U

U-Analyte undetected at given RL
RL-Reporting Limit

1423 Third Avenue, Suite 300
Seattle, Washington 98101
Phone 206.287.9130
Fax 206.287.9131

Data Validation Review Report – EPA Level 2

Project: Kimberly Clark

Project Number: 000105-01

Date: September 28, 2009

This report summarizes the review of analytical results for 8 soil samples collected on July 22nd, 2009. Samples were collected by Anchor QEA, LLC and submitted to Analytical Resources, Inc. (ARI) in Tukwila, Washington. Samples were analyzed for the following:

- Total metals by United States Environmental Protection Agency (USEPA) methods 6010B and 7471A

ARI sample data group (SDG) number PH98 was reviewed in this report. The samples reviewed in this report are presented in Table 1.

Table 1
Samples Reviewed

Sample ID	Lab ID	Matrix	Analyses Requested
KC-TP01-SO	PH98A	Soil	Metals
KC-TP02-SO	PH98B	Soil	Metals
KC-TP03-SO	PH98C	Soil	Metals
KC-TP04-SO	PH98D	Soil	Metals
KC-TP05-SO	PH98E	Soil	Metals
KC-TP06-SO	PH98F	Soil	Metals
KC-TP08-SO	PH98G	Soil	Metals
KC-TP09-SO	PH98H	Soil	Metals

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control (QA/QC) guidelines outlined in the analytical procedures and data quality objective section of the Sampling and Analysis Plan (SAP). Laboratory results were reviewed following USEPA guidelines using *USEPA Contract Laboratory Program National Functional Guidelines for Inorganics Data Review (USEPA, 2004)* as a guideline, and applying laboratory and method QC criteria as stated in SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998. Unless noted in this report, laboratory results for the samples listed above were within QC criteria.

Field Documentation

Field documentation was checked for completeness and accuracy. The chain-of-custody was signed by TA at the time of sample receipt; the samples were received in good condition. Samples were received outside of the recommended 4° ± 2°C. However, samples were received within a short time of collection so data are not impacted.

Holding Times and Sample Preservation

Samples were appropriately preserved and analyzed within holding times.

Laboratory Method Blanks

A laboratory method blank was analyzed at the required frequency and was free of target analytes.

Field Quality Control

Field Blanks

No field blanks were collected in association with this sample set.

Field Duplicates

No field duplicates were collected in association with this sample set.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD)

No MS or MSD were analyzed in association with this data set.

Laboratory Control Sample (LCS)

An LCS was analyzed at the required frequency and resulted in recoveries within laboratory control limits.

Laboratory Duplicates

No laboratory duplicates were analyzed in association with this data set..

Method Reporting Limits

Reporting limits were deemed acceptable as reported. All values were reported using the laboratory's reporting limits. Values were reported as undiluted, or when diluted, the reporting limit accurately reflects the dilution factor.

Overall Assessment

As was determined by this evaluation, the laboratory followed the specified analytical methods and all requested sample analyses were completed. Accuracy was acceptable, as demonstrated by the LCS percent recovery values. Precision was not evaluated. All data were deemed acceptable as reported.

REFERENCES

USEPA. 1983. Methods for Chemical Analysis of Water and Wastes. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio. EPA-600/4-79-020.

USEPA. 1986. Test methods for Evaluating Solid Waste: Physical/Chemical Methods. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. EPA-530/SW-846.

USEPA. 2004. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation (OSRTI). EPA 540-R-04-004. October 2004.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

October 22, 2009

Delaney Peterson
Anchor QEA
1423 3rd Avenue, Suite 300
Seattle, WA 98101

RE: Client Project: Kimberly Clark, 000105-01
ARI Job No.: PS35

Dear Delaney:

Please find enclosed the Chain-of-Custody record, sample receipt documentation, and the final data package for samples from the project referenced above.

Sample receipt and details of these analyses are discussed in the Case Narrative.

An electronic copy of this package will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager
-For-
Susan Dunnihoo
Director, Client Services
sue@arilabs.com
206-695-6207

Enclosures

cc: eFile PS35

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody
Documentation

prepared
for

Anchor QEA

Project: Kimberly Clark, 000105-01

ARI JOB NO: PS35

prepared
by

Analytical Resources, Inc.

Chain of Custody Record & Laboratory Analysis Request

Page 1 of 1 Turnaround Requested: Std.

Anchor Contact: Joy Danay

P198

ANCHOR ENVIRONMENTAL, L.L.C.
1423 Third Ave, Suite 300
Seattle, WA 98101
Ph: (206) 287-9130 Fax: (206) 287-9131

Lab Contact: Sue Dunnihoo	Proj. Name: Kimberly Clark
Lab: ARI	Proj. Number: 000105-01
Address: tukwila	Sampler: John Laplante
Phone:	Shipping Method: hand
Fax:	AirBill:

Analyses Requested: * metals; ~~Grain Size~~ DG

Notes/Comments:

Sample ID	Sample Date	Sample Time	Sample Martix	# Containers	* metals	~~Grain Size~~ DG									Notes/Comments
KC-TP01-SO	7/22	1435	Soil	1	X										Please call to confirm analyses and Archive and TAT
KC-TP02-SO	↓	1440	↓	1	X										
KC-TP03-SO		1445		1	X										
KC-TP04-SO		1452		1	X										
KC-TP05-SO		1455		1	X										
KC-TP06-SO		1458		1	X										
KC-TP08-SO		1503		1	X										
KC-TP09-SO		1506		1	X										
~~KC-TP01-SO~~	~~↓~~	~~1515~~	~~↓~~	~~3~~	~~X~~	DG									

* Sb, As, Cr (total), Cu, Pb, Hg, Ni, Tl, Zn.

Relinquished: (Signature)	Relinquished: (Signature)	Relinquished: (Signature)	Special Instructions/Notes
[signature]			
Printed Name: David Gillingham	Printed Name:	Printed Name:	
Company: Anchor	Company:	Company:	
Date/Time: 7/23/09 1300	Date/Time:	Date/Time:	
Received By: [signature]	Received By:	Received By:	
Printed Name: Rich Hudson	Printed Name:	Printed Name:	
Company: ARI	Company:	Company:	# of Coolers: / Cooler Temp(s):
Date/Time: 7/23/09 1315	Date/Time:	Date/Time:	COC Seals Intact? / Bottles Intact?

PH98 : 00002

PS35 : 00003

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Anchor

COC No(s): ______ NA

Assigned ARI Job No: PH98

Project Name: Kimberly Clark

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: ______

Tracking No: ______ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)		10.8

If cooler temperature is out of compliance fill out form 00070F   Temp Gun ID#: 101886

Cooler Accepted by: [signature]   Date: 7/23/09   Time: 1435

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: ______			
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?	bubble bags ←	YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO

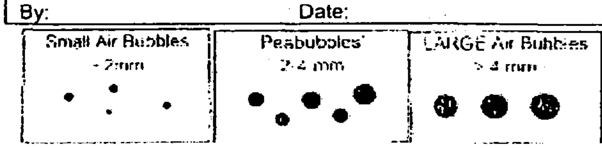
Samples Logged by: AV   Date: 7/23/09   Time: 1728

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Temperature Compliance Form

Cooler#: 1 Temperature(°C): 10.8

Sample ID	Bottle Count	Bottle Type
KC-TP01-SC	1	1 8oz Jar
KC-TP02-SC	1	"
KC-TP03-SC	1	"
KC-TP04-SC	1	"
KC-TP05-SC	1	"
KC-TP06-SC	1	"
KC-TP08-SC	1	"
KC-TP09-SC	1	"

Cooler#: Temperature(°C):

Sample ID	Bottle Count	Bottle Type

Cooler#: Temperature(°C):

Sample ID	Bottle Count	Bottle Type

Cooler#: Temperature(°C):

Sample ID	Bottle Count	Bottle Type

Completed by: AV Date: 7/23/09 Time: 1726

Case Narrative

prepared
for

Anchor QEA

Project: Kimberly Clark, 000105-01

ARI JOB NO: PS35

prepared
by

Analytical Resources, Inc.

Case Narrative

Client: Anchor QEA
Project: Kimberly Clark, 000105-01
Matrix: Soil
ARI Job No.: PS35

Sample receipt

Eight soil samples were received July 23, 2009 under ARI job PH98. The samples were analyzed for Total Metals, as requested on the COC. For further details regarding sample receipt, please refer to the Cooler Receipt Form. On October 12, 2009, three of the eight soil samples were removed from archive and re-logged under ARI job PS35. The samples were analyzed for TCLP Metals, as requested.

TCLP Metals

The samples and associated laboratory QC were digested and analyzed within method recommended holding times.

The method blank was clean at the reporting limits.

The matrix spike percent recoveries and duplicate RPDs were within control limits.

Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

U Indicates that the target analyte was not detected at the reported concentration

* Duplicate RPD is not within established control limits

B Reported value is less than the CRDL but ≥ the Reporting Limit

N Matrix Spike recovery not within established control limits

NA Not Applicable, analyte not spiked

H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible

L Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U Indicates that the target analyte was not detected at the reported concentration

* Flagged value is not within established control limits

B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.

J Estimated concentration when the value is less than ARI's established reporting limits

D The spiked compound was not detected due to sample extract dilution

E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

Geotechnical Data

A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

F Samples were frozen prior to particle size determination

SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

W Weight of sample in some pipette aliquots was below the level required for accurate weighting

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Summary of Laboratory Control Limits Metals Analyses
(All Methods & Sample Matrices)
Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip

Element	Matrix Spike Recovery	LCS Recovery	Replicate RPD
Aluminum	75 - 125	80 - 120	≤ 20%
Antimony	75 - 125	80 - 120	≤ 20%
Arsenic	75 - 125	80 - 120	≤ 20%
Barium	75 - 125	80 - 120	≤ 20%
Beryllium	75 - 125	80 - 120	≤ 20%
Boron	75 - 125	80 - 120	≤ 20%
Cadmium	75 - 125	80 - 120	≤ 20%
Calcium	75 - 125	80 - 120	≤ 20%
Chromium	75 - 125	80 - 120	≤ 20%
Cobalt	75 - 125	80 - 120	≤ 20%
Copper	75 - 125	80 - 120	≤ 20%
Iron	75 - 125	80 - 120	≤ 20%
Lead	75 - 125	80 - 120	≤ 20%
Magnesium	75 - 125	80 - 120	≤ 20%
Manganese	75 - 125	80 - 120	≤ 20%
Mercury	75 - 125	80 - 120	≤ 20%
Nickel	75 - 125	80 - 120	≤ 20%
Potassium	75 - 125	80 - 120	≤ 20%
Selenium	75 - 125	80 - 120	≤ 20%
Silica	75 - 125	80 - 120	≤ 20%
Silver	75 - 125	80 - 120	≤ 20%
Sodium	75 - 125	80 - 120	≤ 20%
Strontium	75 - 125	80 - 120	≤ 20%
Thallium	75 - 125	80 - 120	≤ 20%
Vanadium	75 - 125	80 - 120	≤ 20%
Zinc	75 - 125	80 - 120	≤ 20%

Data Summary Package

prepared
for

Anchor QEA

Project: Kimberly Clark, 000105-01

ARI JOB NO: PS35

prepared
by

Analytical Resources, Inc.

METALS ANALYSIS

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS

Sample ID: KC-TP01-SO
SAMPLE

Lab Sample ID: PS35A
LIMS ID: 09-24057
Matrix: Soil
Data Release Authorized:
Reported: 10/21/09

QC Report No: PS35-Anchor QEA
Project: Kimberly Clark
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
1311	10/15/09	6010B	10/20/09	7440-38-2	Arsenic	0.2	0.2	U
1311	10/15/09	6010B	10/20/09	7440-47-3	Chromium	0.02	0.02	U
1311	10/15/09	6010B	10/20/09	7439-92-1	Lead	0.1	0.1	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS
Page 1 of 1

Sample ID: KC-TP02-SO
SAMPLE

Lab Sample ID: PS35B
LIMS ID: 09-24058
Matrix: Soil
Data Release Authorized:
Reported: 10/21/09

QC Report No: PS35-Anchor QEA
Project: Kimberly Clark
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
1311	10/15/09	6010B	10/20/09	7440-38-2	Arsenic	0.2	0.2	U
1311	10/15/09	6010B	10/20/09	7440-47-3	Chromium	0.02	0.02	U
1311	10/15/09	6010B	10/20/09	7439-92-1	Lead	0.1	0.1	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS
Page 1 of 1

Sample ID: KC-TP03-SO
SAMPLE

Lab Sample ID: PS35C
LIMS ID: 09-24059
Matrix: Soil
Data Release Authorized
Reported: 10/21/09

QC Report No: PS35-Anchor QEA
Project: Kimberly Clark
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
1311	10/15/09	6010B	10/20/09	7440-38-2	Arsenic	0.2	0.2	U
1311	10/15/09	6010B	10/20/09	7440-47-3	Chromium	0.02	0.02	U
1311	10/15/09	6010B	10/20/09	7439-92-1	Lead	0.1	0.1	U

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS
Page 1 of 1

Sample ID: KC-TP01-SO
MATRIX SPIKE

Lab Sample ID: PS35A
LIMS ID: 09-24057
Matrix: Soil
Data Release Authorized:
Reported: 10/21/09

QC Report No: PS35-Anchor QEA
Project: Kimberly Clark
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Arsenic	6010B	0.2 U	4.2	4.0	105%	
Chromium	6010B	0.02 U	0.95	1.00	95.0%	
Lead	6010B	0.1 U	4.0	4.0	100%	

Reported in mg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS
Page 1 of 1

Sample ID: KC-TP01-SO
DUPLICATE

Lab Sample ID: PS35A
LIMS ID: 09-24057
Matrix: Soil
Data Release Authorized:
Reported: 10/21/09

QC Report No: PS35-Anchor QEA
Project: Kimberly Clark
000105-01
Date Sampled: 07/22/09
Date Received: 07/23/09

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Arsenic	6010B	0.2 U	0.2 U	0.0%	+/- 0.2	L
Chromium	6010B	0.02 U	0.02 U	0.0%	+/- 0.02	L
Lead	6010B	0.1 U	0.1 U	0.0%	+/- 0.1	L

Reported in mg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TCLP METALS

Sample ID: METHOD BLANK

Lab Sample ID: PS35MB
LIMS ID: 09-24057
Matrix: Soil
Data Release Authorized:
Reported: 10/21/09

QC Report No: PS35-Anchor QEA
Project: Kimberly Clark
000105-01
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
1311	10/15/09	6010B	10/20/09	7440-38-2	Arsenic	0.2	0.2	U
1311	10/15/09	6010B	10/20/09	7440-47-3	Chromium	0.02	0.02	U
1311	10/15/09	6010B	10/20/09	7439-92-1	Lead	0.1	0.1	U

U-Analyte undetected at given RL
RL-Reporting Limit