

Final Engineering Design Report

Taxiway F Site, Skagit Regional Airport
Burlington, Washington

for

**Washington State Department of Ecology
on Behalf of Port of Skagit County**

July 13, 2011



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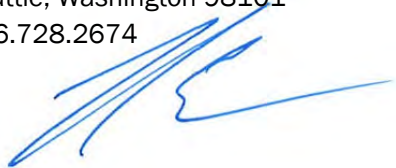
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1.0 INTRODUCTION

This Engineering Design Report (EDR) has been prepared for the planned cleanup of the Taxiway F Site (Site). The Site is formally referenced in the Washington State Department of Ecology (Ecology) databases as the Skagit County Port Site (Ecology facility Site Identification No. 67457634) and is generally located near the western edge of the Skagit Regional Airport in Burlington, Washington (Figure 1). This EDR was 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). The cleanup action is being conducted by the Port of Skagit County (Port) under a Consent Decree (No. TBD) with Ecology.

To address contamination resulting from releases of pesticides and herbicides stored at the Site, the Port has prepared a Remedial Investigation/Feasibility Study (RI/FS; GeoEngineers, 2011a) and a Cleanup Action Plan (CAP; GeoEngineers, 2011b). Site work is anticipated to occur over a period of 3 to 4 months beginning in August 2011.

The primary objective of this EDR is to describe the plans and procedures for cleanup of the Site. A Compliance Monitoring Plan (CMP) describing the performance and conformational monitoring to be performed to verify the effectiveness of the cleanup action is included as an attachment this document (Attachment 1). The major project elements discussed in this EDR include:

- Site Description and Background
- Cleanup requirements
- General description of cleanup action
- Permits
- Site preparation
- Soil excavation and disposal
- Site restoration
- Financial assurance
- Quality assurance/quality control (QA/QC)
- Health and safety
- Schedule and reporting

2.0 BACKGROUND INFORMATION

2.1. Historical Operation and Site Use

In 1933, a single runway was constructed for light airplanes. This original runway would later become Taxiway F. In 1943 the U.S. Navy constructed the airport's current two-runway system as an alternate training field for the Whidbey Island Naval Air Station. After World War II, the federal government continued to operate the airport, primarily for the Civil Air Patrol, until transferring the

facility to Skagit County in 1958. In 1965 the airport was conveyed to the joint ownership of Port of Anacortes and Port of Skagit County. The Port assumed full ownership and operation of the airport in 1975. Prior to 1978, the Site and the surrounding property were used for cattle grazing and farm equipment storage by Ray Jensen, John Petter, and Peth and Sons.

Between 1978 and 2000, the Port leased the portion of the Site immediately adjacent to the taxiway to a series of individuals and companies engaged in the business of crop dusting. In 1978, the Port leased the property to Swanland-Karr, Inc. for crop dusting operations. In 1982, Swanland-Karr, Inc. proposed to construct the hangar building that currently exists at the Site for aircraft parking and materials storage, including storage of chemicals used for crop dusting. William Swanland and Swanland-Belisle, Inc. leased the property in 1985; pesticide products used by the lessee were reported in 1988 to include Dinoseb, Parathion, Thiodon, Chemho-IPC, and Simazon. Environmental review of the leased property performed in 1988 by the Port identified staining in some of the work areas and an apparent oil release on the property. The Port provided the results of the environmental review and suggestions for addressing the identified issues to the lessee. In 1992, the lease was assigned to Belisle Bros. Crop-Dusting, Inc. for continued use for crop dusting activities. In 1993, the lease of the Site property was assigned to Curt Tronsdal and Tronsdal Air Service, Inc. In 1998, the lease of the Site property was assigned to Skagit Ag Services, Inc., which leased the property until the Port discontinued leasing the property in 2000.

Pesticides and herbicides reportedly were stored in the hangar building and loaded onto aircraft for use. After the fenced operations area was vacated by the crop dusting operation in 2000, the Port discovered discolored soil in the vicinity of the hangar building.

2.2. Current and Future Land Use

The Site is located on property classified by Skagit County as Aviation Related (AVR) zoning. The Port currently uses the hangar building for storage of maintenance equipment. The Port has no plans to rezone the property, and does not anticipate any future changes to the current land use (light industrial).

2.3. Previous Site Investigations

Several environmental investigations have been conducted at the Site, beginning with an initial soil investigation in 2000 (EAI, 2000), and culminating in a recent 2011 waste characterization study (Attachment 2). Investigations conducted prior to 2009 are summarized in the RI/FS Work Plan (GeoEngineers, 2009). The RI/FS Report (GeoEngineers, 2011a) presents the results of the RI sampling activities conducted in 2009 and 2010, and uses the results of the RI and earlier investigations to characterize the nature and extent of contamination. The results of the recent 2011 waste characterization study supplements existing soil characterization data summarized in the RI/FS (GeoEngineers, 2011a). The feasibility study (FS) portion of the RI/FS Report describes the evaluation of cleanup action alternatives for the Site. A CAP (GeoEngineers, 2011b) describing the selected cleanup action for the Site was prepared pursuant to the authority of Chapter 70.105D.050(1) of the Revised Code of Washington (RCW) and the requirements of the Washington State Model Toxics Control Act Cleanup Regulation (MTCA), as established in Chapter 173-340 of the Washington Administrative Code (WAC 173-340). For the purposes of the RI/FS and CAP, the Site is divided into three areas: (1) the Historical Operations Area, which comprises approximately 2.2 acres and includes the hangar building and an asphalt-paved aircraft apron; (2)

the Drainage Channel, a shallow, narrow swale that connects the historical operations area to a mixed coniferous-deciduous forest to the east; and (3) the Wetland Area, which is southeast of the historical operations area and is classified as a forested wetland. Figure 2 shows the approximate location of these three areas relative to the Site. During wet weather conditions, the drainage channel captures rainwater runoff from the Historical Operations Area and conveys it to the Wetland Area.

2.4. Geology and Hydrology

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

2.4.1. Soil

Shallow soils at the Site typically consist of 1 to 3 feet of fine to coarse sand and gravel. Clay and silt deposits are present beneath the shallow sand and gravel horizon to depths of approximately 50 to 85 feet below ground surface (bgs). Fine to medium sand deposits with varying amounts of silt and gravel underlie the clay/silt unit to a depth of at least 115 feet bgs (the maximum depth explored at the Site). Published geologic maps for the Site vicinity suggest that much of the material underlying the Site consists of Vashon recessional outwash deposits (poorly sorted sands and gravel, with small amounts of silt and clay; Jones, 1999). Three soil/debris piles are located within, and just outside of, the eastern portion of the Historical Operations Area (Figure 2). The soil/debris piles appear to consist of soil and plant/organic debris, possibly from past land clearing activities.

2.4.2. Groundwater

During wet weather conditions, shallow, unconfined, perched groundwater periodically develops near the interface between the shallow sand/gravel horizon and the underlying clay/silt at depths of 2 to 3 feet bgs. Deep, unconfined groundwater occurs at a depth of about 100 feet bgs in the fine to medium sand deposits below the clay/silt unit. A livestock supply well near the northeast corner of the historical operations area (Figure 2) obtains its water from this deep sandy aquifer. The approximate groundwater flow direction in the deep aquifer is toward the southwest, based on groundwater level measurements taken at the Site (wells MW-1, MW-2, and MW-3) in December 2009, March 2010, June 2010, and September 2010 (GeoEngineers, 2011a). The perched groundwater in the shallow sand/gravel horizon is separated from the deep aquifer by the approximately 50-foot to 85-foot thick clay/silt unit.

2.4.3. Surface Water

During wet weather conditions, rainwater runoff from the historical operations area is conveyed to adjacent pastureland and a forested wetland to the southeast of the operations area. Rainfall and runoff in these areas generally either immediately infiltrates shallow soils (dry season) or accumulates in multiple shallow pools (wet season) while it slowly infiltrates soils, is transported downgradient, and/or gradually evaporates. These surface water features (channelized and overland runoff, local ponding) are temporary or seasonal in nature, and are generally not present, or are only temporarily present, during the dry season. Although localized, short-term ponding and channelized flow of rainwater runoff can occur at the Site during the wet season, the Site does not contain a permanent surface water body. No permanent surface water body exists in the vicinity of

the Site that is hydraulically connected by surface drainages to the Site's temporary surface water features. The closest surface water drainage features, No Name Creek and Indian Slough, are located approximately 1 mile west of the Site and 1.25 miles southeast of the Site, respectively (Figure 1).

2.5. Critical Areas

A mixed deciduous-coniferous forested wetland makes up the southeastern two thirds of the Site area (Figure 2). During wet weather conditions, the wetland receives partial runoff from the historical operations area via a shallow, narrow drainage channel/swale that begins at the eastern boundary of the historical operations area and extends to the southeast.

Four wetlands have been identified on the Site (Hart Crower, 2008a), they are referred to as Wetlands A, B, C and D (Figure 2). The Historical Operations Area contains portions of Wetlands A and D, and all of Wetlands B and C. Wetland D extends north of the historical operations area and Wetland A extends north, east and south of the historical operations area.

- Wetland A is approximately 2.19 acres in size,
- Wetland B is approximately 0.007 acres in size,
- Wetland C is approximately 0.002 acres, and
- Wetland D is approximately 0.09 acres.

Wetland A contains forested and emergent plant communities, Wetland B contains a scrub/shrub plant community, and Wetlands C and D contain emergent plant communities. The Updated Wetland Restoration Plan (GeoEngineers, 2011c; Attachment 3) provides a detailed description the characteristics and location of the identified wetlands.

3.0 NATURE AND EXTENT OF CONTAMINATION

As noted above, several environmental investigations have been conducted at the Site between 2000 and 2011. The results of GeoEngineers 2010 study and previous Site investigation are presented in GeoEngineers RI/FS report (GeoEngineers, 2011a) and are shown on Figure 3. The results of the 2011 waste characterization study are presented in Attachment 2. The RI used information about the history and environmental conditions of the Site gathered during the multiple environmental investigations to characterize the nature and extent of contamination. The nature and extent of contamination in soil, groundwater and surface water are summarized below in Sections 3.1 through 3.3 (additional details are provided in the GeoEngineers RI/FS report [GeoEngineers, 2011a]). The cleanup levels referenced below are discussed further in Section 4.1.

3.1. Soil Conditions

Contaminants detected in soil during previous investigations include chlorinated and organophosphate pesticides, herbicides, arsenic, and VOCs. The arsenic concentrations detected in soil are consistent with statewide natural background concentrations (Ecology, 1994). Similarly, VOCs are not considered contaminants of concern (COCs) at the Site because of the limited

number and low concentrations of the VOC detections reported. Based on the Site investigation results, pesticides (aldrin, total chlordane, DDT, dieldrin, endosulfan heptachlor toxaphene) and herbicides (atrazine, chlorothalonil, dinoseb, pentachlorophenol, terbutryn, trifluralin, vernolate) were detected in soil at concentrations greater than Site cleanup levels (see Section 4.1.1).

In the Historical Operations Area, the wetland area, and the drainage channel connecting the historical operations area to the wetland area, COC exceedances are limited to samples obtained from the upper 1 foot of soil, with the highest concentrations occurring in the upper 6 inches of soil. However, sampling data indicate that COC exceedances may extend to a depth of up to 2 feet bgs in the eastern portion of the Historical Operations Area and central portion of the Wetlands Area.

Soil analytical results from the tree root-base sampling in the Wetlands Area indicate that contamination does not extend to the root bases of the mature conifer trees, and is concentrated in the lower topographical areas.

Soil analytical results from the 2011 waste characterization study indicated that the contaminated soil does not designate as a toxicity characteristic dangerous waste because chlordane, heptachlor and heptachlor epoxide analyzed using the toxicity characteristic leaching procedure (TCLP) were detected at concentrations less than the maximum concentration of contaminants for the toxicity characteristic (WAC 173-303-090).

3.2. Groundwater Conditions

A deep groundwater aquifer (approximately 100 feet bgs) is isolated from the shallow (perched) groundwater zone by an approximately 50-foot to 80-foot thick clay/silt unit. Dissolved arsenic and low levels of pesticides (endosulfans [several orders of magnitude below the cleanup level]) were reported in groundwater samples obtained from deep monitoring wells MW-1, MW-2, and MW-3 in January 2004. However, the arsenic concentrations detected were consistent with regional background concentrations in Skagit County, and the endosulfan detections were close to the analytical PQLs. Endosulfans and other pesticides were not detected in the deep monitoring wells during subsequent quarterly monitoring events in 2004 and 2005. The low-level detections of endosulfans reported in the January 2004 samples likely were the result of cross-contamination in the field or laboratory (GeoEngineers, 2009).

Groundwater sampling completed in 2009-2010 indicates that shallow (perched) groundwater exceeds Site cleanup levels for pesticides (heptachlor epoxide) and herbicides (2,4-dichlorophenoxyacetic acid [2,4-D], bentazon, dinoseb and 2-methyl-4-chlorophenoxy-acetic acid [MCPA]) at monitoring well locations GEI-MW-4, GEI-MW-6, GEI-MW-7, and GEI-MW-8. The highest concentrations of dinoseb, MCPA, and heptachlor epoxide were detected in GEI-MW-8; the highest concentration of bentazon was detected in GEI-MW-4. Based on Site investigation results, bentazon exceedances appear to be concentrated in the northern portion of the Historical Operations Area. Dinoseb, MCPA and heptachlor epoxide exceedances appear to be concentrated in the northern and eastern portions of the Historical Operations Area and along the Drainage Channel between the Historical Operations Area and the Wetland Area. Perched groundwater in the southwestern portion of the Historical Operations Area (at well location GEI-MW-5) does not exceed cleanup levels.

Additionally, pesticides (DDT and endosulfan) and herbicides (dinoseb) were detected at concentrations exceeding cleanup levels in shallow groundwater grab samples obtained in 2001 from direct-push borings B-2, B-5, and B-7 (GeoEngineers, 2001). As discussed in the Work Plan (GeoEngineers, 2009), the previous exceedances reported at direct-push locations B-2, B-5, and B-7 are not considered definitive data because these groundwater samples were not obtained from monitoring wells.

3.3. Surface Water Conditions

Pesticides, herbicides, and arsenic have been detected in historical surface water (rainwater runoff) grab samples collected at the Site. Endosulfans (detected in 12 of 13 samples) were the most prevalent COC detected in the samples (GeoEngineers, 2011a). However, surface water at the Site is not considered to be a separate environmental medium requiring further remedial action because: (1) it is a temporary surface manifestation of perched groundwater during the wet season, or is present only ephemerally during the dry season following large rainfall events; and (2) it is not hydraulically connected to any nearby permanent surface water bodies.

4.0 CLEANUP REQUIREMENTS

Cleanup actions conducted under MTCA must comply with MTCA cleanup standards for the identified COCs and affected media, as well as applicable regulatory requirements based on Federal and State laws (WAC 173-340-710). This section identifies cleanup standards, and applicable regulatory requirements for the Cleanup Action Plan (CAP) selected cleanup action.

4.1. Cleanup Standards

Cleanup standards consist of: (1) cleanup levels that are protective of human health and the environment, (2) the point of compliance at which the cleanup levels must be met, and (3) regulatory requirements established in applicable State and Federal laws. Site-specific cleanup levels and points of compliance for indicator hazardous substances are summarized in the following sections.

Under MTCA, the term "indicator hazardous substances" means a subset of hazardous substances present at a site that can be used for monitoring and analysis during any phase of remedial action for the purpose of characterizing the site or establishing cleanup compliance. In accordance with the CAP and WAC 173-340-703, total endosulfan will be the indicator hazardous substance for remedial actions addressing Site soils. Dinoseb, bentazon, 2,4-D, MCPA, aldrin, dieldrin, heptachlor, and heptachlor epoxide will be the indicator hazardous substances for perched groundwater. As discussed above, surface water at the Site is generally a temporary, seasonal surface expression of perched groundwater, and will be addressed through the remediation of perched groundwater. Consistent with the CAP, surface water is not considered to be a separate environmental medium with separate indicator hazardous substances for the cleanup action.

4.1.1. Cleanup Levels

Site-specific cleanup levels for indicator hazardous substances in soil and groundwater are discussed below. Detailed information regarding the derivation of cleanup levels is provided in the CAP (GeoEngineers, 2011b).

4.1.1.1. SOIL

Soil cleanup levels for the Site are presented in Table 1. As indicated above, total endosulfan will be used as an indicator hazardous substance for remedial actions addressing Site soils. The cleanup level for total endosulfan will apply to all areas of the Site.

4.1.1.2. GROUNDWATER

Groundwater cleanup levels for the Site are presented in Table 2. As indicated above, Dinoseb, bentazon, 2,4-D, 2-methyl-4-chlorophenoxy-acetic acid (MCPA), aldrin, dieldrin, heptachlor, and heptachlor epoxide will be used as an indicator hazardous substance for remedial actions addressing perched groundwater at the Site. The cleanup level for groundwater is applicable to all areas of the Site.

4.1.1.3. POINTS OF COMPLIANCE

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

4.1.1.4. SOIL

In accordance with WAC 173-340-740(6)(b), for soil cleanup levels (Table 1) that are based on protection of groundwater, the point of compliance is in soil throughout the Site. In accordance with WAC 173-340-740(6)(e), WAC 173-340-7490(4)(b), and WAC 173-340-740(6)(d), for soil cleanup levels that are based on ecological considerations (e.g., protection of wildlife) or human exposure via direct contact, the point of compliance is in soil throughout the Site from the ground surface to 15 feet bgs.

4.1.1.5. GROUNDWATER

In accordance with WAC 173-340-720(8)(b), the point of compliance for groundwater is the uppermost level of the saturated zone extending vertically to the lowermost depth in which groundwater occurs throughout the Site. As described in the CAP, the cleanup action will address the shallow groundwater aquifer that is in direct contact with the contaminated soil whereas, the deeper groundwater at the Site has been shown to not contain contamination.

5.0 PERMITS

The cleanup action will be performed pursuant to MTCA under the terms of Consent Decree. Therefore, the cleanup action is exempt from the procedural requirements of certain laws and all local permits (WAC 173-340-710[9][a]). However, the cleanup action must comply with the substantive requirements of these laws and permits. Permits and substantive requirements applicable to the cleanup action are discussed in the following Sections.

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, State dangerous waste will be generated as the result of the planned excavation activities. The soil evaluation is summarized below.

As indicated above, supplemental soil characterization activities were completed at the Site (see Attachment 2) to evaluate whether to evaluated contaminants present would designated as a

“characteristic” dangerous waste (WAC 173-303-090). A contaminant has the potential to designate as a dangerous waste if its concentration in soil is greater than 20 times¹ the associated toxicity characteristic threshold listed in WAC 173-303-090(8). As part of the 2011 waste characterization study, representative samples of the soil were obtained from the Site and analyzed by the toxicity characteristic leaching procedure (TCLP) for chlordane, heptachlor and heptachlor epoxide because the detected concentrations exceeded the 20 times the trigger value (0.6 mg/kg, 0.16 mg/kg and 0.16 mg/kg respectively) based on the results of previous Site investigations. The results of TCLP testing indicate that the soil to be excavated at the Site would not designate as a “characteristic” dangerous waste.

Washington State also 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 show that portions of soil to be excavated at the Site will be designated as “toxic” and “persistent” dangerous waste (Figure 4).

Soil excavated from locations designating as a dangerous waste, as described above, will be managed in accordance with Washington State Dangerous Waste Regulations. This will include segregating the soil, as required by the Landfill Use Authorization, to meet landfill disposal requirements. Soil that is segregated will be temporarily stockpiling on Site prior to landfill disposal. Preliminary landfill use authorizations for Waste Management and Republic Services are provided in Attachment 4. The Contractor will be required to obtain final landfill use authorizations prior to transport and disposal. The Washington State Dangerous Waste Site Identification number for the Taxiway F Site is Site ID No. WAH000038466.

5.2. 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. Ecology is the lead SEPA agency for this cleanup action. The SEPA checklist for the project is provided in Attachment 5.

5.3. Erosion and Sediment Control and Stormwater Management

The Ecology General Construction Stormwater NPDES permit is required for clearing, grading and/or excavation that results in the disturbance of one or more acres and discharges stormwater

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>

to surface waters of the State. This permit is applicable to the cleanup action because of the potential for discharge of construction stormwater to surface water. Stormwater management and erosion and sedimentation control for the protection of surface water during the cleanup action will be conducted in accordance with the substantive requirements of the Washington State Water Pollution Control Act (RCW 90.48) and are described in the Construction Stormwater Pollution Prevention Plan (SWPPP; Attachment 6) for the Site. The Construction Stormwater General NPDES permit is included in Attachment 7.

5.4. Skagit County Critical Areas Ordinance

The Skagit County Critical Areas Ordinance was developed under the directives of the Washington State Growth Management Act to designate and protect critical areas. Critical areas are defined as wetlands, aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas. The provisions of the ordinance pertaining to the protection of wetland functions and values are applicable to the Taxiway F Site cleanup action. Because the cleanup action is being implemented pursuant to a Consent Decree, under WAC 173-340-710(9)(a), the cleanup is exempt from the procedural requirements of the Critical Areas Ordinance however, the substantive requirements of the permit must be met by the cleanup project. At Ecology's request, the Port completed a pre-application meeting with the County and submitted a critical areas checklist for review by the Skagit County Department of Planning and Development Services pursuant to Chapter 14.24 of the Skagit County Code. The critical areas checklist and the County's letter documenting that the cleanup project meets the Critical Areas Ordinance requirements is provided in Attachment 8.

5.5. Skagit County Grading Permit

The Grading Permits are used by Skagit County (County) for any subsurface excavation and/or fill work and is applicable to the cleanup action based on the excavation for the removal of contaminated soil and subsequent backfilling. Under the MTCA Permit Exemption the cleanup is exempt from the procedural requirements of the Grading Permit. However, the substantive requirements of the Grading Permit must be met by the cleanup project. At Ecology's request, the Port completed a pre-application meeting and a design review with the County. The County letter documenting that the project meets the applicable Grading Permit requirements is presented in Attachment 9.

5.6. Water Quality Management

The Clean Water Act (CWA) is the primary Federal law for protecting water quality from pollution. The CWA is the primary Permit from the USACE are required to obtain a Section 401 Water Quality Certification from Ecology to demonstrate compliance with State water quality standards and other aquatic resource protection requirements under Ecology's authority. The USACE has determined that the cleanup activities described in the Cleanup Action Plan meet the requirements of Section 401, including Ecology's Water Quality Certification and the Coastal Zone Management Act requirements, and have issued a permit for the project has issued a NWP 38 permit for the project. The NWP 38 permit is included in Attachment 10.

5.7. Other Potentially 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 of this report describe air emissions controls in greater detail.
- **Noise Ordinance Requirements** – Construction activities will be carried out in a manner consistent with the 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. Section 10.4 of this report describes 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 7.0). 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.

6.0 CLEANUP ACTION

The Cleanup Action consists of excavation and off-site disposal of soil containing contaminant concentrations above MTCA cleanup levels within the Historical Operations Area, Drainage Channel and Wetlands Areas and Site restoration. This section provides a summary of the cleanup action objectives, cleanup standards, and a general description of the proposed cleanup action. Project drawing detailing the Cleanup Action are presented on Sheets 1 through 18.

The cleanup action will consist of the following activities:

- Implementation of erosion control, Site protection measures, and security measures.
- Removal or protection of aboveground structures at the Site as necessary to provide access to soil with concentrations of COCs exceeding Site-specific cleanup levels.
- Clearing and grubbing vegetated areas of the drainage channel and wetland area.
- Excavation of surface soils throughout the Site containing COC concentrations greater than Site-specific cleanup levels to the lateral limits defined by the clean sample boundary.
- Stockpiling and transport of excavated contaminated soils for disposal at an off-site, permitted facility in accordance with the landfill use authorization (Attachment 4).

- Management of surface water, stormwater, and groundwater, as necessary, during excavation activities.
- Collection of verification soil samples from the base of the excavations for laboratory analysis, by methods and at the locations and frequency defined in the CMP (Attachment 1).
- Backfilling the excavation with clean, imported structural fill or with appropriate topsoil mix as required by the restoration plans for the Site.
- Restoration of the paved surfaces.
- Restoration of vegetated areas and re-vegetation monitoring, in accordance with the Wetland Restoration Plan (Attachment 3).
- Installation of previously decommissioned monitoring wells and completion of confirmational groundwater monitoring to verify the reduction of COC concentrations in shallow (perched) groundwater as a result of the contaminated soil (source) removal.

The objective of the cleanup action is to eliminate, reduce, or otherwise control to the extent feasible and practicable, unacceptable risks to human health and the environment posed by pesticides and herbicides in soil and groundwater at the Site in accordance with MTCA (WAC 173-340) and other applicable regulatory requirements.

6.1. Site Preparation

Site work will include remedial excavation of approximately 4,300 in-place cubic yards from the Historical Operations Area, Drainage Channel and Wetlands Area. The remediation area is approximately 95,886 square feet (2.2 acres) and contaminated soils will be removed from the top 6 inches to approximately 2 feet. The actual quantities of excavated soil may be greater or less than this estimate based on the results of verification sampling at the excavation limits (see Sections 6.2.4)

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

6.1.1. Hours of Operation

Work associated with the cleanup action will be performed during daylight hours. Exceptions to the allowable work hours may be made at the discretion of the Port.

6.1.2. Construction Access

Project access will be from Farm-to-Market Road. There is an existing asphalt access road beyond the Port's security fence that will serve as a construction access (entry and exit) to the Site. An asphalt overlay will be applied to the Port's access road to prevent damages from the heavy hauling activities and minimize the need for extensive repair. Other access to this site on unpaved areas will be minimized, yet where necessary, access points will be stabilized (using quarry spalls or other relevant material) to minimize the tracking of sediment onto the Taxiway F and roads. Street sweeping and street cleaning will be employed, as necessary, to prevent sediment from

being tracked onto the Taxiway F and/or from entering state waters. Construction access and traffic control for the Cleanup Action is presented on Sheets 4 and 5.

6.1.3. Construction Staging Area

A portion of Taxiway F located west of 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, storage of supplies and material management containment areas. The staging area is shown relative to the Site on Sheets 4 and 5.

6.1.4. Materials Management Areas

Materials management areas will be constructed in the vicinity of the remedial excavation for temporary storage of contaminated soil/woody debris and non-contaminated woody material generated during Site Work. Stockpile containment areas will be constructed in accordance with the SWPPP (Attachment 6) 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 (Sheet 6). Stockpiled soil will be covered and secured from wind, rain, and other disturbances as appropriate to control erosion and dust.

It is assumed that the contaminated soil/woody materials generated during the cleanup action will not need to be stockpiled and can be loaded directly into trucks for off-site disposal. However, some of the 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 sampled to determine disposal requirements, as necessary. Wastewater will be treated in accordance with the Ecology Construction Stormwater General Permit and Accompanying Order, as necessary, prior to disposal and/or releasing to vegetated areas south and west of the project area.

Stockpiling procedures are described in greater detail in Sections 6.2.2.

6.1.5. Excavation Water Detention Areas

Sedimentation and stormwater controls will be implemented to prevent turbid or contaminated stormwater from leaving the remedial excavation area in accordance with the SWPPP (Attachment 6). Stormwater collected within the remedial excavation area will be directed toward shallow sumps within the remedial excavation area and transferred to portable storage tanks. Collected water will be analyzed for COCs prior to discharge on Site or off Site disposal in accordance with the SWPPP. The excavation water detention (tank staging) area(s) will be located in the general vicinity of the remedial excavation area.

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 the construction phasing and traffic control plans included in the project contract documents and presented on Sheet 4. Prior to the start of work, the Contractor will be responsible for providing and installing temporary Site fencing, barricades, signage, and other traffic control devices as necessary for cordoning off the work area. The project is located within the secured area of the Airport.

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

Vehicles will enter and leave the Site via Bay View Road. Bayview Road will provide the route for project-related vehicles. Taxiway F will be used to stage trucks while waiting for loading.

6.1.6.2. 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 (NPDES Permit No. WAR124975; Attachment 7). The Port intends to transfer the Construction Stormwater General Permit to the selected contractor. The Port contract will require the Contractor to be responsible for implementing the project SWPPP (Attachment 6). Erosion control procedures are detailed in the project contract documents and on Sheets 5 and 6. 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.
- Access points will be stabilized using quarry spalls or other relevant material to minimize the tracking of sediment onto the Taxiway F and roads.
- Street sweeping and street cleaning will be employed, as necessary, to prevent sediment from being tracked onto the Taxiway F and Bay View Road.

6.1.6.3. 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 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, as necessary, 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.

6.1.7. Demolition

6.1.7.1. CLEAR AND GRUB VEGETATED/FORESTED AREAS

Vegetated/forested areas will be cleared and grubbed to the extent required to complete remedial excavation at the Site. Mature cedar trees located within and adjacent to the remedial excavation area, identified on Sheet 7, will be protected, to the extent practical. Remedial excavation activities within the vicinity of these trees will be limited to the tree's drip line. Other trees and vegetation removed from the Site will be salvaged and chipped on Site for re-use as mulch for the site restoration. Trees and vegetation removed from the Site will be completed in a manner to minimize contact with contaminated soils. Stumps and root bases for trees and vegetation in contact with contaminated soils will be ground and transported from the Site for permitted disposal facility. Trees with a trunk diameter greater than approximately 6 inches will be cut and limed for reuse on Site within Wetland A as directed by the Port. Large trees may be cut into sections, no less than 8-foot lengths, for the purpose of handling.

6.1.7.2. EXISTING DEBRIS REMOVAL/RELOCATION

Debris piles within the remedial excavation area will be relocated at the Site, to the extent necessary, to access contaminated soils beneath these piles. Debris piles containing contaminants will be transport off-site for disposal (if necessary).

6.1.7.3. DEMOLISH ASPHALT SURFACES

Asphalt surfaces within the Historical Operations Area will be demolished, as necessary, access contaminated soil beneath and to facilitate repaving. Demolished asphalt debris will be transported from the Site to an appropriate construction debris receiving facility approved by the Port.

6.1.7.4. REMOVE EXISTING FENCE

Portions of the existing fencing encompassing the Historical Operation Area (barbed wire fence) will be temporarily removed, as necessary, to access contaminated soils. Fencing will be restored, as necessary, following backfilling and re-vegetation of the area.

6.1.7.5. MONITORING WELL ABANDONMENT

Monitoring wells MW-1 through MW-3 and GEI-MW4 through GEI-MW8, located at the Site, will be decommissioned by a Washington-licensed driller in accordance with Ecology requirements (WAC 173-160-460) prior to any soil excavation.

A Livestock Well is located outside of the remedial excavation limits and will be protected during the construction activities.

6.1.7.6. REMOVAL OF PREVIOUSLY ABANDONED ABOVE GROUND STRUCTURES

An abandoned light pole and an abandoned water hydrant located in the northern portion of the Historical Operations Area (Sheet 7) will be removed and reclaimed by the Port.

6.1.8. Utility Protection

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. Currently known underground utilities at the Site include an underground power line, a previously abandoned propane line, and an underground water line (Sheet 7).

During the remedial excavation activities, utilities will be protected in-place or disconnected and reinstalled/restored following the completion of remedial excavation activities to their original condition with three exceptions. The portion of power line feeding an abandoned light pole in the northern portion of the Historical Operations Area, a previously abandoned propane line located beneath the hangar building, and the water line feeding an abandoned water valve will be removed and transported off-site for disposal or reclaimed by the Port, if exposed during the cleanup action (Sheet 7).

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. The contractor will be responsible for notifying respective agencies at least seven days prior to conducting remedial excavation activities in the immediate vicinity of utilities and shall be responsible for obtaining necessary inspections.

6.1.9. Hangar Building and Other Above Ground Structures

To achieve complete removal of contaminated soil beneath the Hangar building, the contractor will be required to select a method protecting and repair of the existing structures, if damaged. Building foundation and floor materials and functions will be required to be restored to their original condition following completion of remedial excavation. The building structure may be left in place and protected or moved from the existing location, but the existing structure must be returned to the current location following completion of remedial excavation and restoration of the foundation and floor. The contractor will be responsible for submitting an Excavation Plan that outlines the Contractor's methods for performing remedial excavation including within the building and procedures for protecting and/or restoring the Hangar Building during and following the Cleanup Action construction activities. The Plan will require the Port's approval.

Other above ground structures including existing silicon solar panel box and currently functional water hydrant located in the northeast portion of the historical operation area will be left in place and protected or moved from the existing location but must be returned to the current location following completion of remedial excavation and restored to original condition. Functions of silicon solar panel box and associated electric fence disturbed during the excavation activities must be restored to its original condition following the completion of remedial excavation.

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. Contaminated soil will be excavated from the Historical Operations Area, Drainage Channel and Wetlands Area at the Site as indicated by Sheets 7 and 8². Excavation activities are described below.

6.2.1. Excavation Approach and Methods

Soil excavation will be performed using commonly available excavation methods. Excavation procedures will include the following:

- Soil excavation will be initiated to the preliminary elevations shown on Sheet 7. The excavation base will be extended as necessary to achieve the cleanup objectives. Excavation will be completed laterally to established control points (defined by existing “clean” sampling locations Sheet 8), or, if the “clean” sampling locations are not reached or are a significant distance away from the nearest location requiring excavation, additional verification samples will be collected from the excavation sidewall, as appropriate, to confirm the completeness of the contamination removal. Excavation will be performed using standard earthmoving equipment. The overall excavation area has been divided into units to facilitate construction management and materials tracking. A target final elevation has been identified for each unit based on the existing sample data to ensure that the known thickness of contamination will be removed within each unit.
- As soil excavation proceeds, verification soil samples will be collected from the base of the preliminary excavation limits by a geologist, environmental scientist, or engineer for laboratory analysis. Verification sampling is discussed in Section 6.2.4.
- If the initial base 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 subsequent verification samples obtained from the excavation base indicate that complete removal of contamination has been achieved.
- Commonly available dewatering techniques will be implemented as described in the SWPPP to minimize the water content of the excavated materials to the extent possible to minimize loss of contaminants from the excavation and to facilitate base sample collection.

6.2.2. Soil Segregation and Stockpiling

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. If necessary, soil may be temporarily stockpiled by the Contractor in materials management area described in Section 6.1.4.

Segregation of excavated soil will be conducted, as necessary, to comply with the requirements of the selected landfill facility. Some excavation of soil outside of the remediation limits will be necessary to facilitate final paving and grading activities. These soils will be managed separately

²Minor revisions were made to the limits of excavation as shown on Sheet 8 as compared to those identified in Figure 4 of CAP (GeoEngineers, 2011b). Modifications to the limits of excavation were corrections to the limit lines based on the locations of clean contiguous sample locations.

from the contaminated soil and will be profiled for Site COCs prior to reuse. Details regarding construction of temporary stockpile containment areas are presented on Sheet 6. Stockpiled soil will be covered and secured from wind, rain, and other disturbances as appropriate to control erosion and dust.

6.2.3. Construction Dewatering and Wastewater Characterization

Construction dewatering may be required to maintain a dry excavation, to the extent possible, to reduce the water content of excavated soil and to enable verification sampling. The Contractor will also be responsible for collection of water in soil stockpiling areas. In the event that heavy rains occur during project activities, attempts will be made to collect accumulated surface water within the project area.

If construction dewatering is necessary, water will be directed to shallow sediment traps within the project area and pumped to temporary holding tanks to the extent practicable. Collected wastewater will be analyzed for total endosulfan (endosulfan I, endosulfan II and endosulfan sulfate) and turbidity as required by the SWPPP, and Companion Order. Based on chemical analytical results of the wastewater samples, wastewater will be treated as necessary for discharge on Site or transported from the Site for permitted disposal to a facility approved by the Port. Waste water discharged on Site will be released south and west of the remedial excavation area.

6.2.4. Verification Sampling

Verification sampling will involve collecting soil samples from the base of the remedial excavation to verify that cleanup levels have been achieved. If the “clean” sidewall sample locations are not reached or are a significant distance away from the nearest location requiring excavation, additional verification samples will be collected from the excavation sidewall, as appropriate, to confirm the completeness of the contamination removal. Verification sampling will consist of the following steps:

Discrete samples will be obtained from the limits of the remedial excavations at the sampling density described in CMP (Attachment 1).

The verification soil samples will be analyzed to assess compliance with site-specific cleanup levels (Table 1) and minimize contractor standby time.

Soil verification samples will be analyzed for total endosulfan (indicator hazardous substance for soil). Further details regarding verification sampling are provided in the attached CMP.

6.2.5. Backfilling and Compaction

The contractor will survey the excavation area following placement of backfill to ensure compliance with the Paving and Grading Plan (Sheets 10 and 11). The remedial excavation will be backfilled as follows:

- Areas excavated underneath the Hangar building and within the existing asphalt and gravel driveway will be backfilled with clean, imported structural fill material or as directed by the Port to meet the paving restoration requirements.

- Areas excavated within the existing vegetated/forested uplands and wetlands area will be backfilled with an appropriate clean topsoil mix or as directed by the Port to meet vegetation restoration requirements.

In addition, the contractor will provide the Port with verification that all imported granular fill materials and topsoil mix have been tested and certified to be free of contaminants in accordance with project specifications and contract documents. Backfill testing requirements are summarized in Table 3. The source for the fill material and topsoil mix will be documented in the construction completion report for the project.

6.3. Soil Transport and Disposal

The excavated soil has been characterized for disposal as required by MTCA, Washington State Dangerous Waste Regulations (WAC 173-303) where appropriate, and the waste-profiling requirements of the selected disposal facilities. The excavated soil falls into two categories: (1) non-dangerous waste, suitable for disposal at a Subtitle D landfill; and (2) state hazardous/dangerous waste, suitable for disposal at a Subtitle D or C landfill. Based on the existing data, approximately 70% classifies as a state hazardous/dangerous Waste. Soil designating as a state hazardous/dangerous waste will be handled in accordance Washington State Dangerous Waste Regulations (WAC 173-303).

6.4. Site Restoration

This section outlines the planned restoration of the Historic Operations Area (hangar building and asphalt driveway), Drainage Channel and Wetlands Area following soil excavation and backfilling activities. Site restoration plans are detailed in the project contract documents, and are depicted in Sheets 9 through 17.

6.4.1. Utilities

Disconnected, relocated and/or damaged utilities will be reinstalled/restored following the completion of remedial excavation activities to their original condition with the following exceptions:

- The power line feeding the abandoned light pole will not be restored.
- The abandoned propane line beneath the hangar building will not be restored.
- The water line feeding the abandoned water hydrant will not be restored.

6.4.2. Surface Restoration

Ground surfaces within the Historical Operations Area and Drainage Channel affected by the cleanup activities will be restored/finished with clean, imported structural fill material. Disturbed portions of the asphalt driveway and hangar building concrete floor slab will also be restored. Disturbed surfaces will be restored in accordance with pavement and landscape restoration plans (Sheets 9 through 17) and FAA standards (taxiway areas) to include the following:

- If excavation operations do not require removal of all pavements within the Site, existing pavements will be rehabilitated as necessary in conjunction with construction of new pavement areas to provide a uniform pavement surface.

- Pavements will be designed to support a nominal aircraft and vehicle load of 20,000 pounds. Pavement section materials and construction standards will be based on WSDOT specifications.
- Surface grades will be adjusted to the extent allowed by existing limitations to improve surface drainage. Installation of new drainage structures and pipes to improve pavement surface drainage is not included in the project.
- Shoulders within aircraft operations areas of the Site will be constructed per FAA standards to the extent allowed by existing constraints.

6.4.3. Re-vegetation and Wetland Restoration

Areas disturbed by the remedial excavation within the Drainage Channel and Wetlands Area, including the portions of the upland vegetated/forested area, will be backfilled with appropriate clean topsoil and re-vegetated in accordance with the Wetlands Restoration Plan (Attachment 3) and Corps Permit (Permit No. NWS-2008-19-NO; Attachment 9).

7.0 COMPLIANCE MONITORING

Compliance monitoring and contingency responses (as needed) will be implemented in accordance with WAC 173-340-410. The three types of compliance monitoring to be performed include:

- Protection Monitoring to confirm that human health and the environment are adequately protected during the construction phase of the cleanup action.
- Performance Monitoring to confirm that the cleanup action has attained cleanup standards.
- Confirmational Monitoring to confirm the long-term effectiveness of the cleanup action.

The protection monitoring plan for the cleanup action will be addressed in a Health and Safety Plan (HASP; included as an appendix to the CMP; Attachment 1). Performance and confirmational monitoring are detailed in the CMP (Attachment 1). The objective of the performance and confirmational monitoring is to confirm that cleanup standards are achieved and to confirm the long-term effectiveness of the cleanup action. The CMP is included as an attachment to this EDR (Attachment 1) and describes the duration and frequency of monitoring, the trigger for contingency response actions, contingency response actions, and the rationale for terminating monitoring.

8.0 CONTINGENCY PLAN

The planned performance monitoring detailed in the CMP (Attachment 1) will ensure that contaminated soil is removed from the Site. Four consecutive rounds of confirmational (post-construction) groundwater monitoring, in which water is present in all Site monitoring wells, will be completed following the cleanup action to ensure that groundwater cleanup standards have been achieved for the Site. Groundwater monitoring will be completed to verify the reduction of COC concentrations in shallow groundwater as a result of the contaminated soil (source) removal. If COCs are detected above cleanup levels in groundwater after the initial four monitoring events, semi-annual groundwater monitoring will be conducted as required by Ecology. If groundwater

samples continue to exceed the cleanup levels without abating, additional actions will be developed and implemented as approved by Ecology.

A contingency plan for the Site will be prepared and submitted to Ecology for approval prior to implementation of any contingency actions.

9.0 FINANCIAL ASSURANCE

Pursuant to WAC 173-340-440(11) and the terms of the Consent Decree, the Port 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 Port 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 Consent Decree.

10.0 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 the CMP (Attachment 1).

10.1. Contractor Quality Control

The contractor will prepare a Construction Quality Assurance Plan before commencing work. This plan will be subject to review and approval by the Port to ensure that the planned actions are in accordance with the project contract requirements. The Construction Quality Assurance 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, proposed corrective action, and corrective actions taken.

In addition to the contractor's construction quality assurance plan, the Port and or construction managers on behalf of the Port will perform oversight of the contractor's activities.

10.2. 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.

10.3. Analytical QA/QC

Analytical QA/QC is described in the QAPP (Appendix C of the CMP; Attachment 1). The QAPP describes soil 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.

10.4. 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.

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 A of the CMP (Attachment 1). 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.

11.0 SCHEDULE

Pending Ecology approvals, cleanup-related construction work is scheduled to begin in August 2011. The construction duration is estimated to occur over a period of 3 to 4 months.

12.0 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 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 groundwater monitoring events.
- **Monthly Progress Report** – A monthly progress report will be made by the Port to Ecology as required by the Consent Decree.

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.

13.0 REFERENCES

- EAI, "Soil Sampling and Testing, Skagit Farmers Supply - Port of Skagit Lease Property," Skagit County Airport, Skagit County, WA, Report JN 20250. Environmental Associates, Inc., 2000.
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- GeoEngineers, Inc., "Final Work Plan, Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport," Ecology Agreed Order No. 6158, 2009.
- GeoEngineers, Inc. (2011a), "Draft Final Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport," Ecology Agreed Order No. 6158.
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- GeoEngineers, Inc. (2011c), "Updated Wetland Restoration Plan, Port of Skagit County - Taxiway F Site, Skagit County, Washington."
- McNair, F., Personal Communication with Randel Perry, U.S. Army Corps of Engineers, March 15, 2011.
- Hart Crowser, Inc. (2008a), "Wetland Restoration Plan, Port of Skagit County, Farmers Supply/Tronsdale Site, Skagit County, Washington," File No. 12053-18, Prepared for Port of Skagit County, File No. 12053-18, dated June 24, 2008.
- Hart Crowser, Inc. (2008b), "Focused Remedial Investigation/Feasibility Study Addendum, Skagit Farmers Supply Site, Burlington, Washington," File No. 12053-18, Prepared for Port of Skagit County, dated June 30, 2008.
- Hart Crowser, Inc. (2008c), "Cleanup Action Plan (CAP), Voluntary Cleanup Action, Skagit Farmers Supply Site, Burlington, Washington," Prepared for Port of Skagit County, File No. 12053-18, dated June 30, 2008.

14.0 LIMITATIONS

We have prepared this EDR for use by Ecology and the Port of Skagit County during the cleanup action at the Taxiway F Site. Within the limitations of scope, schedule and budget, our 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, express 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 will serve as the official document of record.

TABLES

Table 1
Soil Cleanup Levels
Taxiway F Site, Skagit Regional Airport
Burlington, Washington

Constituent	CAS No.	Site-Specific Soil Cleanup Level ¹
Chlorinated Pesticides (mg/kg)		
aldrin	309-00-2	0.059
alpha chlordane (cis-chlordane)	5103-71-9	NE
gamma chlordane	5566-34-7	NE
total chlordane	57-74-9	2.05
4,4'-DDD	72-54-8	4.2
4,4'-DDE	72-55-9	2.9
4,4'-DDT	50-29-3	2.9
total DDT (sum of 4,4' isomers)	EDF-229	0.75
dieldrin	60-57-1	0.063
endosulfan I	959-98-8	NE
endosulfan II	33213-65-9	NE
endosulfan sulfate	1031-07-8	NE
Total Endosulfan	115-29-7	2.4
endrin ketone	53494-70-5	NE
heptachlor	76-44-8	0.22
heptachlor epoxide	1024-57-3	0.11
lindane (gamma-BHC)	58-89-9	0.77
methoxychlor	72-43-5	400
toxaphene	8001-35-2	0.91
Organophosphate Pesticides (mg/kg)		
azinphos-methyl (guthion)	86-50-0	NE
chlorpyrifos (chlorpyriphos)	2921-88-2	240
methyl parathion	298-00-0	20
parathion (parathion ethyl)	56-38-2	480
Herbicides (mg/kg)		
3,5-dichlorobenzoic acid	51-36-5	NE
4-nitrophenol	100-02-7	NE
2,4,5-TP (silvex)	93-72-1	640
2,4,5-T (2,4,5-trichlorophenoxyacetic acid)	93-76-5	800
2,4-DB	94-82-6	640
2,4-D (2,4-dichlorophenoxyacetic acid)	94-75-7	800
bentazon	25057-89-0	2,400
chloramben	133-90-4	1,200
USA DCPA (dacthal)(total DCPA diacid)(chlorthal)	1861-32-1	800
dicamba	1918-00-9	2.2
dichlorprop	120-36-5	NE
dinoseb	88-85-7	0.524
MCPA (2-methyl-4-chlorophenoxy-acetic acid)	94-74-6	40
MCPP (2-(2-methyl-4-chlorophenoxy)propionic acid)	7085-19-0	NE
pentachlorophenol	87-86-5	4.5
triclopyr (trichlopyr)	55335-06-3	NE

Constituent	CAS No.	Site-Specific Soil Cleanup Level ¹
Miscellaneous Pesticides/Herbicides (mg/kg)		
alachlor	15972-60-8	12
atrazine	1912-24-9	4.5
triadimefon/bayleton	43121-43-3	480
chlorothalonil (daconil)	1897-45-6	91
chlorpropham	101-21-3	16,000
dicofol	115-32-2	NE
diphenamid	957-51-7	2,400
EPTC (S-ethyl dipropylthiocarbamate) (eptam)	759-94-4	2,000
metolachlor	51218-45-2	12,000
metribuzin	21087-64-9	2,000
napropamide	15299-99-7	8,000
cis-permethrin	54774-45-7	NE
trans-permethrin	61949-77-7	NE
total permethrin	52645-53-1	4,000
prometon (pramitol 5p)	1610-18-0	1,200
propazine	139-40-2	1,600
simazine	122-34-9	8.3
terbacil	5902-51-2	1,000
terbutryn (igran)	886-50-0	80
trifluralin	1582-09-8	130
vernolate/vernam	1929-77-7	10
VOCs (mg/kg)		
2-chlorotoluene (o-chlorotoluene)	95-49-8	2.06
benzene	71-43-2	0.0262
acetone	67-64-1	8,000
1,2-dichlorobenzene	95-50-1	7,200
toluene	108-88-3	6,400
1,1,1-trichloroethane	71-55-6	1.36
1,2,4-trimethylbenzene	95-63-6	4,000
1,3,5-trimethylbenzene	108-67-8	4,000
o-xylene	95-47-6	88
Metals (mg/kg)		
arsenic	7440-38-2	20
zinc	7440-66-6	360

Notes:

¹Detailed information regarding the derivation of cleanup levels is provided in the Draft CAP (GeoEngineers, 2011b).

mg/kg = milligram per kilogram

VOCs = volatile Organic Compounds

NE = not established

Green shading indicates indicator hazardous substance that will be used for remedial actions addressing Site soils.

Table 2
Groundwater Cleanup Levels
Taxiway F Site, Skagit Regional Airport
Burlington, Washington

Constituent	CAS No.	Site-Specific Groundwater Cleanup Level ¹
Chlorinated Pesticides (µg/L)		
aldrin	309-00-2	0.05
alpha chlordane (cis-chlordane)	5103-71-9	NE
gamma chlordane	5566-34-7	NE
total chlordane	57-74-9	2
4,4'-DDD	72-54-8	0.36
4,4'-DDE	72-55-9	0.26
4,4'-DDT	50-29-3	0.26
total DDT (sum of 4,4' isomers)	EDF-229	NE
dieldrin	60-57-1	0.05
endosulfan I	959-98-8	NE
endosulfan II	33213-65-9	NE
endosulfan sulfate	1031-07-8	NE
Total Endosulfan	115-29-7	96
endrin ketone	53494-70-5	NE
heptachlor	76-44-8	0.05
heptachlor epoxide	1024-57-3	0.05
lindane (gamma-BHC)	58-89-9	0.2
methoxychlor	72-43-5	80
toxaphene	8001-35-2	1.00
Organophosphate Pesticides (µg/L)		
azinphos-methyl (guthion)	86-50-0	--
chlorpyrifos (chlorpyrifos)	2921-88-2	48
methyl parathion	298-00-0	4
parathion (parathion ethyl)	56-38-2	96
Herbicides (µg/L)		
3,5-dichlorobenzoic acid	51-36-5	--
4-nitrophenol	100-02-7	--
2,4,5-TP (silvex)	93-72-1	50
2,4,5-T (2,4,5-trichlorophenoxyacetic acid)	93-76-5	--
2,4-DB	94-82-6	130
2,4-D (2,4-dichlorophenoxyacetic acid)	94-75-7	160
bentazon	25057-89-0	480
chlorthal	133-90-4	--
USA DCPA (dacthal)(total DCPA diacid)(chlorthal)	1861-32-1	160
dicamba	1918-00-9	480
dichlorprop	120-36-5	--
dinoseb	88-85-7	7
MCPA (2-methyl-4-chlorophenoxy-acetic acid)	94-74-6	8
MCPP (2-(2-methyl-4-chlorophenoxy)propionic acid)	7085-19-0	--
pentachlorophenol	87-86-5	1
triclopyr (trichlopyr)	55335-06-3	--

Constituent	CAS No.	Site-Specific Groundwater Cleanup Level ¹
Miscellaneous Pesticides/Herbicides (µg/L)		
alachlor	15972-60-8	2
atrazine	1912-24-9	3
triadimefon/bayleton	43121-43-3	480
chlorothalonil (daconil)	1897-45-6	8
chlorpropham	101-21-3	3,200
dicofol	115-32-2	--
diphenamid	957-51-7	480
EPTC (S-ethyl dipropylthiocarbamate) (eptam)	759-94-4	200
metolachlor	51218-45-2	2,400
metribuzin	21087-64-9	400
napropamide	15299-99-7	1,600
cis-permethrin	54774-45-7	--
trans-permethrin	61949-77-7	--
total permethrin	52645-53-1	800
prometon (pramitol 5p)	1610-18-0	240
propazine	139-40-2	320
simazine	122-34-9	4
terbacil	5902-51-2	--
terbutryn (igran)	886-50-0	16
trifluralin	1582-09-8	11
vernolate/vernarn	1929-77-7	8
VOCs (µg/L)		
2-chlorotoluene (o-chlorotoluene)	95-49-8	160
benzene	71-43-2	5
acetone	67-64-1	800
1,2-dichlorobenzene	95-50-1	720
toluene	108-88-3	640
1,1,1-trichloroethane	71-55-6	200
1,2,4-trimethylbenzene	95-63-6	400
1,3,5-trimethylbenzene	108-67-8	400
o-xylene	95-47-6	16,000
Metals (µg/L)		
arsenic	7440-38-2	8.0
zinc	7440-66-6	4,800

Notes:

¹Detailed information regarding the derivation of cleanup levels is provided in the Draft CAP (GeoEngineers, 2011b).

µg/L = microgram per liter

VOCs = volatile Organic Compounds

NE = not established

Green shading indicates indicator hazardous substance that will be used for remedial actions addressing perched groundwater.

Table 3
Backfill Testing Requirments
Taxiway F Site, Skagit Regional Airport
Burlington, Washington

Constituent	CAS No.	Analytical Method	Site-Specific Soil Cleanup Level
Pesticides (mg/kg)			
aldrin	309-00-2	8081A-GC/ECD	0.059 ¹
alpha chlordane (cis-chlordane)	5103-71-9	8081A-GC/ECD	NE
gamma chlordane	5566-34-7	8081A-GC/ECD	NE
total chlordane (sum of alpha chlordane and gamma chlordane)	57-74-9	8081A-GC/ECD	2.05 ³
4,4'-DDD	72-54-8	8081A-GC/ECD	4.2 ¹
4,4'-DDE	72-55-9	8081A-GC/ECD	2.9 ¹
4,4'-DDT	50-29-3	8081A-GC/ECD	2.9 ¹
total DDT (sum of 4,4' isomers)	EDF-229	8081A-GC/ECD	0.75 ⁴
dieldrin	60-57-1	8081A-GC/ECD	0.063 ¹
endosulfan I	959-98-8	8081A-GC/ECD	NE
endosulfan II	33213-65-9	8081A-GC/ECD	NE
endosulfan sulfate	1031-07-8	8081A-GC/ECD	NE
total endosulfan (sum of endosulfan I, II and endosulfan sulfate)	115-29-7	8081A-GC/ECD	2.4 ⁵
endrin ketone	53494-70-5	8081A-GC/ECD	NE
heptachlor	76-44-8	8081A-GC/ECD	0.22 ¹
heptachlor epoxide	1024-57-3	8081A-GC/ECD	0.11 ¹
lindane (gamma-BHC)	58-89-9	8081A-GC/ECD	0.77 ¹
methoxychlor	72-43-5	8081A-GC/ECD	400 ²
toxaphene	8001-35-2	8081A-GC/ECD	0.91 ¹
Organophosphate Pesticides			
azinphos-methyl (guthion)	86-50-0	8141mod-GC/MS	NE
chlorpyrifos (chlorpyriphos)	2921-88-2	8081mod-GC/MS	240 ²
methyl parathion	298-00-0	8141mod-GC/MS	20 ²
parathion (parathion ethyl)	56-38-2	8081mod-GC/MS	480 ²
Herbicides (mg/kg)			
3,5-dichlorobenzoic acid	51-36-5	8151A-ECD or GC/MS	NE
4-nitrophenol	100-02-7	8151A-ECD or GC/MS	NE
2,4,5-TP (silvex)	93-72-1	8151A-ECD or GC/MS	640 ²
2,4,5-T (2,4,5-trichlorophenoxyacetic acid)	93-76-5	8151A-ECD or GC/MS	800 ²
2,4-DB	94-82-6	8151A-ECD or GC/MS	640 ²
2,4-D (2,4-dichlorophenoxyacetic acid)	94-75-7	8151A-ECD or GC/MS	800 ²
bentazon	25057-89-0	8321B/8151A-ECD or GC/MS	2400 ²
chloramben	133-90-4	8151A-ECD or GC/MS	1200 ²
USA DCPA (dacthal)(total DCPA diacid)(chlorthal)	1861-32-1	8081mod-GC/MS	800 ²
dicamba	1918-00-9	8151A-ECD or GC/MS	2.2 ³
dichlorprop	120-36-5	8151A-ECD or GC/MS	NE
dinoseb	88-85-7	8081mod-GC/MS	0.524 ³
MCPA (2-methyl-4-chlorophenoxy-acetic acid)	94-74-6	8151A-ECD or GC/MS	40 ²
MCPP (2-(2-methyl-4-chlorophenoxy)propanic	7085-19-0	8151A-ECD or GC/MS	NE
pentachlorophenol	87-86-5	8081mod-GC/MS	4.5 ⁴
triclopyr (trichlopyr)	55335-06-3	8151A-ECD or GC/MS	NE
Miscellaneous Pesticides/Herbicides (mg/kg)			
alachlor	15972-60-8	8081mod-GC/MS	12 ¹
atrazine	1912-24-9	8081mod-GC/MS	4.5 ¹
triadimefon/bayleton	43121-43-3	8081mod-GC/MS	480 ²
chlorothalonil (daconil)	1897-45-6	8081mod-GC/MS	91 ¹
chlorpropham	101-21-3	8081mod-GC/MS	16000 ²

Constituent	CAS No.	Analytical Method	Site-Specific Soil Cleanup Level
dicofol	115-32-2	8081mod-GC/MS	NE
diphenamid	957-51-7	8081mod-GC/MS	2400 ²
EPTC (S-ethyl dipropylthiocarbamate) (eptam)	759-94-4	8081mod-GC/MS	2000 ²
metolachlor	51218-45-2	8081mod-GC/MS	12000 ²
metribuzin	21087-64-9	8081mod-GC/MS	2000 ²
napropamide	15299-99-7	8081mod-GC/MS	8000b
cis-permethrin	54774-45-7	8081mod-GC/MS	NE
trans-permethrin	61949-77-7	8081mod-GC/MS	NE
total permethrin	52645-53-1	8081mod-GC/MS	4000 ²
prometon (pramitol 5p)	1610-18-0	8081mod-GC/MS	1200 ²
propazine	139-40-2	8081mod-GC/MS	1600 ²
simazine	122-34-9	8081mod-GC/MS	8.3 ¹
terbacil	5902-51-2	8081mod-GC/MS	1000 ²
terbutryn (igran)	886-50-0	8081mod-GC/MS	80 ²
trifluralin	1582-09-8	8081mod-GC/MS	130 ¹
vernolate/vernam	1929-77-7	8081mod-GC/MS	10 ²
Total Petroleum Hydrocarbons			
gasoline-range	NA	NWTPH-Gx	30 ⁶
diesel-range	NA	NWTPH-Dx with acid-silica gel cleanup	2000 ⁶
heavy oil-range	NA	NWTPH-Dx with acid-silica gel cleanup	2000 ⁶
VOCs (mg/kg)			
benzene	71-43-2	8021B/8260B-GC/MS	0.0262 ³
ethylbenzene	100-41-4	8021B/8260B-GC/MS	6 ⁶
toluene	108-88-3	8021B/8260B-GC/MS	7 ⁶
xylene	1330-20-7	8021B/8260B-GC/MS	9 ⁶
2-chlorotoluene (o-chlorotoluene)	95-49-8	8260B-GC/MS	2.06 ³
acetone	67-64-1	8260B-GC/MS	72000 ⁴
1,2-dichlorobenzene	95-50-1	8260B-GC/MS	7200 ²
1,1,1-trichloroethane	71-55-6	8260B-GC/MS	1.36 ³
1,2,4-trimethylbenzene	95-63-6	8260B-GC/MS	NE
1,3,5-trimethylbenzene	108-67-8	8260B-GC/MS	800 ²
PAHs (mg/kg)			
naphthalene	91-20-3	8270D/SIM	5 ⁶
2-methylnaphthalene	91-57-6	8270D/SIM	320 ²
1-methylnaphthalene	90-12-0	8270D/SIM	34.5 ¹
acenaphthylene	208-96-8	8270D/SIM	NE
acenaphthene	83-32-9	8270D/SIM	4800 ²
fluorene	86-73-7	8270D/SIM	3200 ²
phenanthrene	85-01-8	8270D/SIM	NE
anthracene	120-12-7	8270D/SIM	24000 ²
fluoranthene	206-44-0	8270D/SIM	3200 ²
pyrene	129-00-0	8270D/SIM	2400 ²
benzo[g,h,i]perylene	191-24-2	8270D/SIM	NE
benzo[a]anthracene	56-55-3	8270D/SIM	1.4 ¹
chrysene	218-01-9	8270D/SIM	140 ¹
benzo[b]fluoranthene	205-99-2	8270D/SIM	1.4 ¹
benzo[k]fluoranthene	207-08-9	8270D/SIM	14 ¹
benzo[a]pyrene	50-32-8	8270D/SIM	0.14 ¹
indeno[1,2,3-c,d]pyrene	193-39-5	8270D/SIM	1.4 ¹
dibenz[a,h]anthracene	53-70-3	8270D/SIM	0.14 ¹
total carcinogenic PAH - TEQg	NA	NA	0.14 ¹

Constituent	CAS No.	Analytical Method	Site-Specific Soil Cleanup Level
Metals (mg/kg)			
silver (Ag)	7440-22-4	6010B/6020/7471A	400 ²
arsenic (As)	7440-38-2	6010B/6020/7471A	20 ⁶
barium (Ba)	7440-39-3	6010B/6020/7471A	16000 ²
cadmium (Cd)	7440-43-9a	6010B/6020/7471A	2 ⁶
chromium III (Cr III)	7440-47-3	6010B/6020/7471A	2000 ⁶
mercury (Hg)	7439-97-6	6010B/6020/7471A	2 ⁶
lead (Pb)	7439-92-1	6010B/6020/7471A	250 ⁶
selenium (Se)	7782-49-2	6010B/6020/7471A	400 ²
zinc (Zn)	7440-66-6	6010B/6020/7471A	360 ⁴

Notes:

¹ Based on MTCA Method B Standard Formula Value, Carcinogen, Direct Contact (ingestion), Unrestricted Land Use (WAC 173-340-745[5][b][iii][B]).

² Based on MTCA Method B Standard Formula Value, Non-Carcinogen, Direct Contact (ingestion), Unrestricted Land Use (WAC 173-340-745[5][b][iii][B]).

³ Based on Protection of Groundwater (Calculated).

⁴ Based on Site-Specific terrestrial ecological evaluation (TEE) values from Table 749-3, MTCA 173-340-900. Wildlife values used.

⁵ Based on Site-Specific Calculated TEE values (soil concentrations protective of wildlife) for endosulfan and dinoseb were calculated by GeoEngineers.

⁶ Based on MTCA Method A, Unrestricted Land Use, Table Value.

⁷ Total carcinogenic Polycyclic Aromatic Hydrocarbon (cPAH) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene.

mg/kg = milligram per kilogram

VOCs = volatile Organic Compounds

PAHs = polycyclic aromatic hydrocarbons

NA = Not available

NE = not established

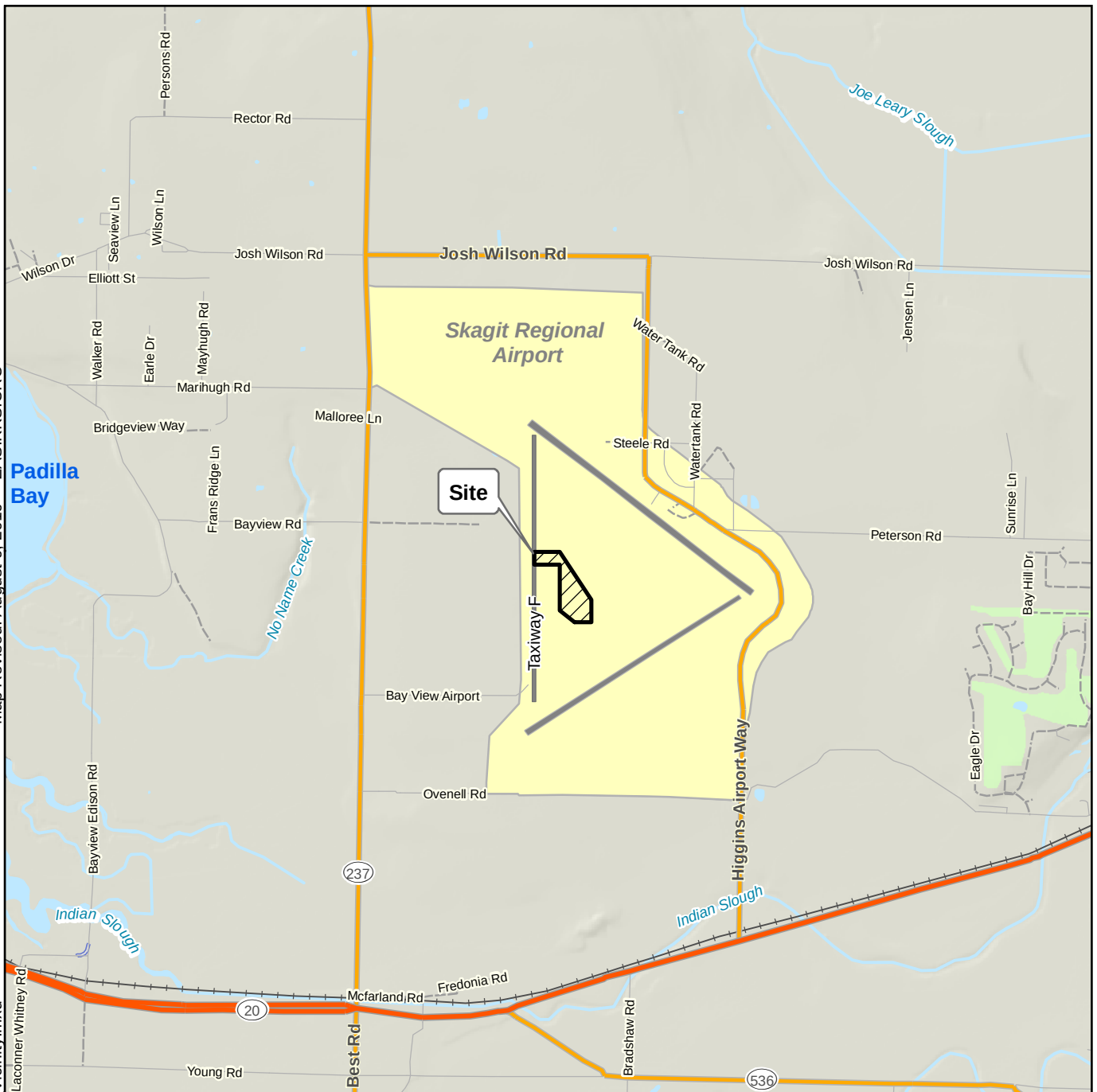
Green shading indicates indicator hazardous substance that will be used for remedial actions addressing Site soils.

FIGURES

Map Revised: August 9, 2010 ZAS:KKS:CRC

Path: P:\5364013\GIS\536401302 FIG-1 Vicinity.mxd

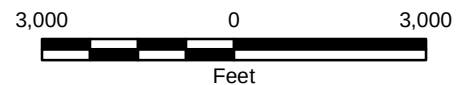
Office: SEA



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.
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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

Taxiway F Site
Burlington, Washington



Figure 1



Legend

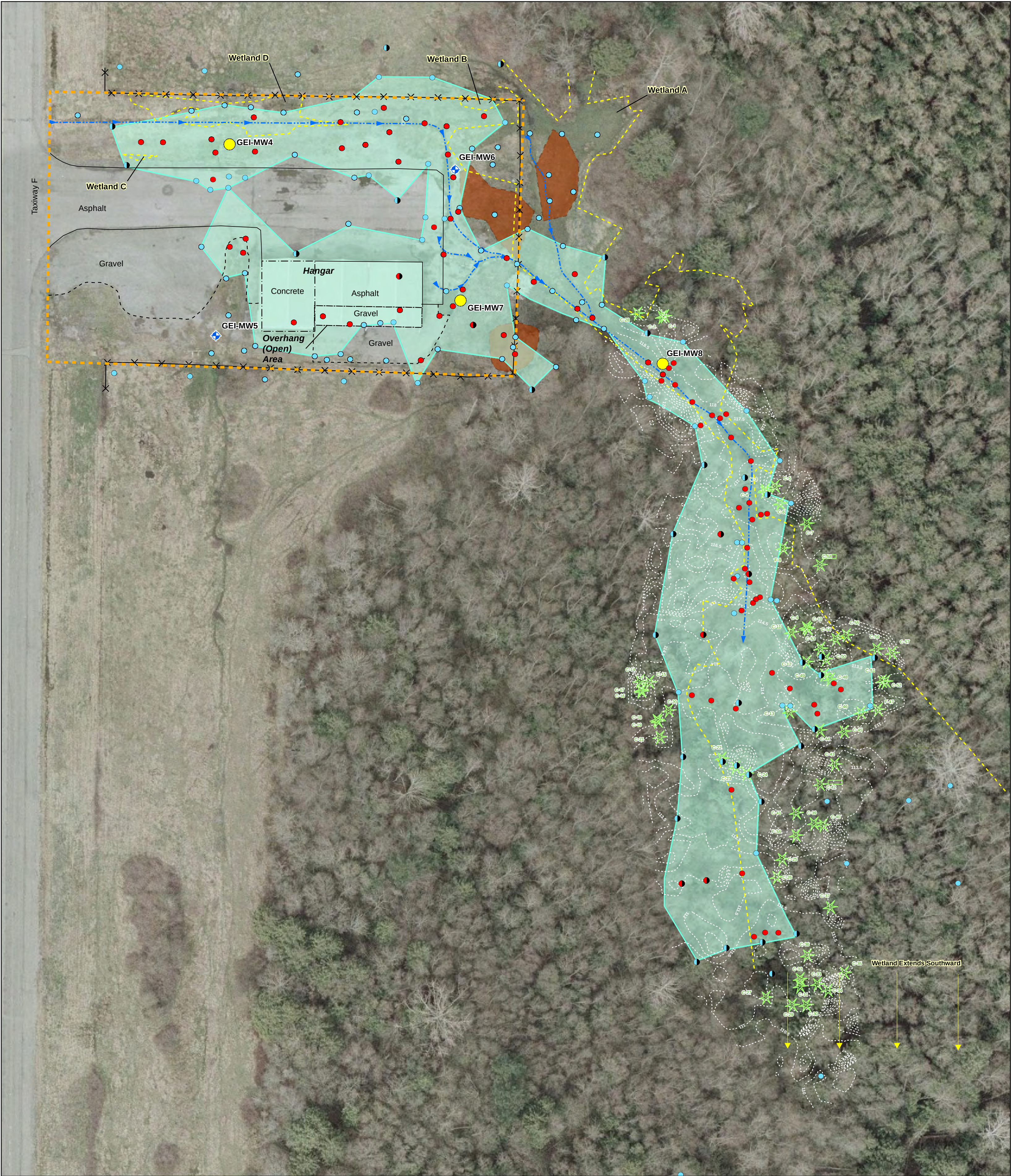
	Shallow Monitoring Well		Historical Operations Area		Drainage Channel (Approximate Rainwater Runoff/Flow Direction)
	Deep Monitoring Well		Fence Line		Wetland Area (Approximate Extent Based on Hart Crowser Wetland Restoration Plan [Hart Crowser, 2008a])
	Water Supply Well		Debris Area		

Site Plan	
Taxiway F Site Burlington, Washington	
	Figure 2

Reference: Aerial photo (dated 2004) from Skagit County. Historical Operations Area boundary, fence line, and rainwater runoff/flow direction obtained from Hart Crowser Focused RI/FS Addendum (Hart Crowser, 2008b).

Notes:

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Legend

--- Historical Operations Area	Wetland Area (Approximate Extent Based on Hart Crowser Wetland Restoration Plan [Hart Crowser, 2008a])
✕ Fence Line	Limits of Excavation
Debris Area	Mature Cedar/Fir Tree
Drainage Channel (Approximate Rainwater Runoff/Flow Direction)	Topographic Contour (elevation in feet)

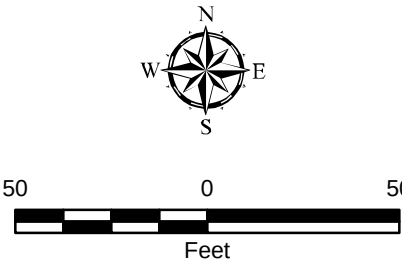
Existing Data Summary

● No Soil Cleanup Level Exceedance (GEI 2009-2010)	● Groundwater Cleanup Level Exceedance in Shallow Groundwater (2009 - 2010 Data)
● No Soil Cleanup Level Exceedance (Historical)	● No Groundwater Cleanup Level Exceedance in Shallow Groundwater (2009 - 2010 Data)
● Soil Cleanup Level Exceedance (GEI 2009-2010)	
● Soil Cleanup Level Exceedance (Historical)	

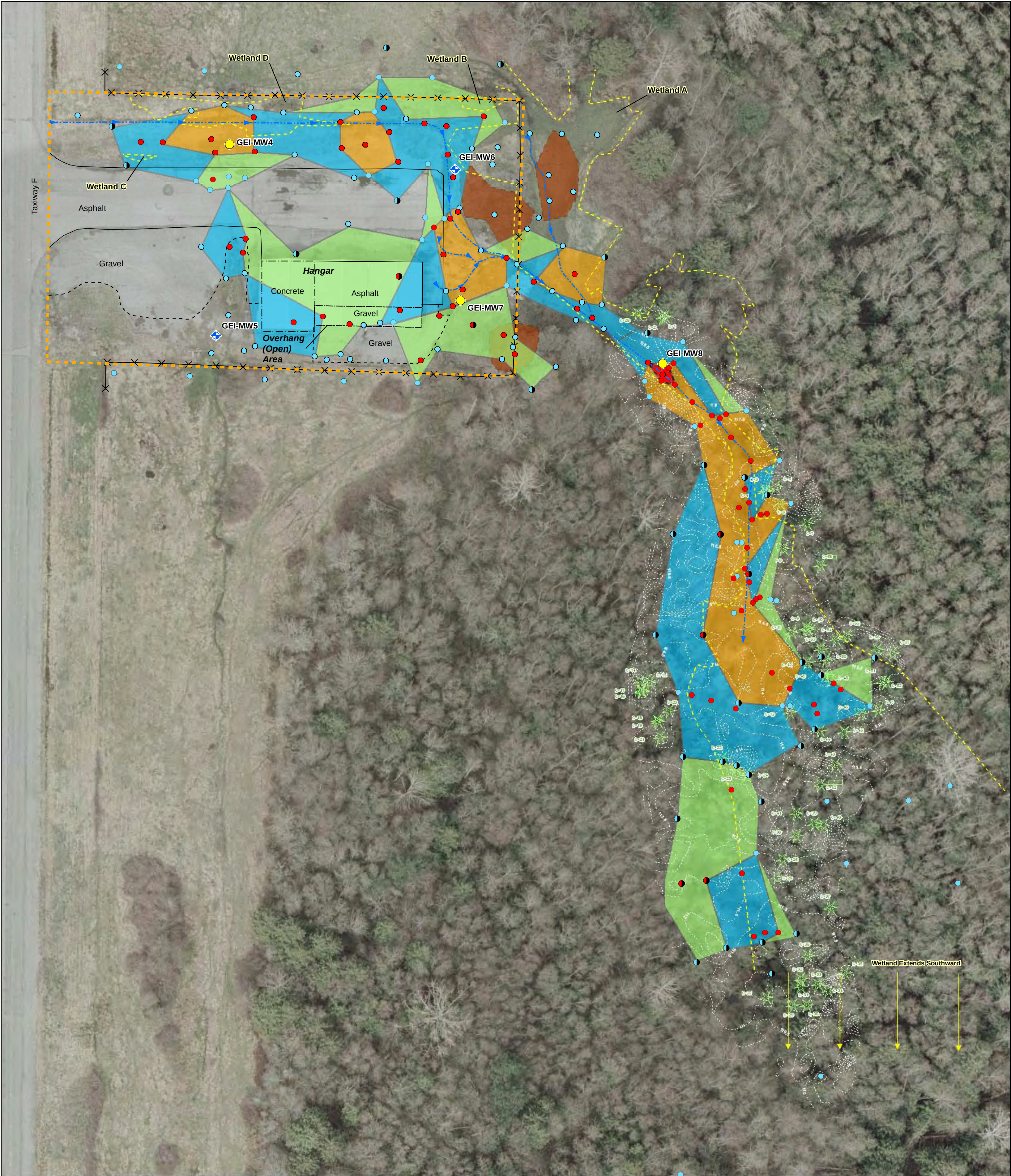
Reference: Aerial photo (dated 2004) from Skagit County. Historical Operations Area boundary, fence line, and rainwater runoff/flow direction obtained from Hart Crowser Focused RI/FS Addendum (Hart Crowser, 2008b).

Notes:

- The locations of all features shown are approximate.
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Remedial Investigation Results and Limits of Excavation	
Taxiway F Site Burlington, Washington	
GEOENGINEERS	Figure 3



Legend

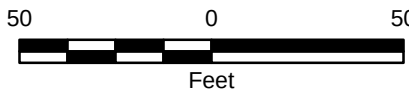
- Historical Operations Area
- Fence Line
- Debris Area
- Drainage Channel (Approximate Rainwater Runoff/Flow Direction)
- Wetland Area (Approximate Extent Based on Hart Crowser Wetland Restoration Plan [Hart Crowser, 2008a])
- Mature Cedar/Fir Tree
- Topographic Contour (elevation in feet)

Existing Data Summary

- No Soil Cleanup Level Exceedance (GEI 2009-2010)
- No Soil Cleanup Level Exceedance (Historical)
- Soil Cleanup Level Exceedance (GEI 2009-2010)
- Soil Cleanup Level Exceedance (Historical)
- Groundwater Cleanup Level Exceedance in Shallow Groundwater (2009 - 2010 Data)
- No Groundwater Cleanup Level Exceedance in Shallow Groundwater (2009 - 2010 Data)

Waste Designation Legend

- Non-Hazardous Waste
- Toxic and Persistent Dangerous Waste (State Waste Code WT02 and WP02)
- Toxic Dangerous Waste (State Waste Code WT02)
- Toxic and Persistent Extremely Hazardous Waste (State Waste Code WT01 and WP01)



Waste Designation

Taxiway F Site
Burlington, Washington



Figure 4

Reference: Aerial photo (dated 2004) from Skagit County. Historical Operations Area boundary, fence line, and rainwater runoff/flow direction obtained from Hart Crowser Focused RI/FS Addendum (Hart Crowser, 2008b).
Notes:
1. The locations of all features shown are approximate.
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PROJECT DRAWINGS

WASHINGTON STATE DEPARTMENT OF ECOLOGY

TAXIWAY F CLEANUP ACTION PROJECT



Port of Skagit

SEC 4, T34N, R03E



Reference: ESRI Data & Maps, Street Maps 2005.

VICINITY MAP

SCALE: 1"=3000'

GRAPHIC SCALE



No. SHEET TITLE

- 1 COVER SHEET
- 2 PROJECT OVERVIEW
- 3 PROJECT OVERVIEW PHOTOS
- 4 CONTRACTOR PHASING AND TRAFFIC CONTROL PLAN
- 5 EROSION AND SEDIMENT CONTROL PLAN
- 6 EROSION AND SEDIMENT CONTROL DETAILS
- 7 REMEDIAL EXCAVATION PLAN
- 8 REMEDIAL EXCAVATION DETAILS
- 9 PAVING AND GRADING PLAN
- 10 GRADING PLAN
- 11 GRADING PLAN
- 12 PAVING AND GRADING DETAILS
- 13 RE-VEGETATION AND WETLAND RESTORATION PLAN
- 14 WETLAND RESTORATION PLANTING PLAN
- 15 WETLAND RESTORATION PLANTING PLAN
- 16 WETLAND RESTORATION PLANTING PLAN
- 17 WETLAND RESTORATION PLANTING PLAN
- 18 PLANTING DETAILS



Reference: ESRI Data & Maps, Street Maps 2005.

SITE MAP

SCALE: 1"=400'

GRAPHIC SCALE



SURVEY NOTES AND DATUM INFORMATION:

- 1. PROJECT INFORMATION WAS OBTAINED FROM TWO SEPARATE SURVEYS UTILIZING DIFFERENT COORDINATES FOR PROJECT CONTROL. THIS RESULTED IN A HORIZONTAL DIFFERENCE OF $\pm 0.22'$ AND A VERTICAL DIFFERENCE OF $\pm 0.06'$ BETWEEN THE TWO SURVEYS. TOPOGRAPHIC SURVEY, CONTOURS, AND DESIGN WITHIN AND AROUND THE HISTORICAL OPERATIONS AREA ARE BASED ON PRECISION APPROACH ENGINEERING SURVEY DATED 2011. TOPOGRAPHIC SURVEY, CONTOURS, AND DESIGN WITHIN THE FORESTED REGION ARE BASED ON LBS SURVEY DATED MAY 2007.
- 2. PRIOR TO BEGINNING THE PROJECT, PROJECT SURVEY REFERENCE CONTROL POINT TABLES FOR THE TWO SURVEYS WILL BE PROVIDED TO THE CONTRACTOR FOR CONTROL OF THE PROJECT. EXISTING SURVEY CONTROL SHALL BE VERIFIED AND CONFIRMATION PROVIDED TO GEOENGINEERS PRIOR TO STARTING THE CONSTRUCTION.
- 3. CONTRACTOR SHALL UTILIZE APPROPRIATE PROJECT CONTROL COORDINATES WHEN PERFORMING CONSTRUCTION SURVEY WITHIN THE TWO SURVEY AREAS. CONTRACTOR SHALL COORDINATE WITH GEOENGINEERS FOR GRADING TRANSITIONS IN AREAS WHERE THE TWO SURVEYS INTERSECT.

GRAPHIC SCALE



PLAN TITLE

SCALE: 1"=40'



NORTH

SECTION / ELEVATION TITLE

SCALE: 1"=40'

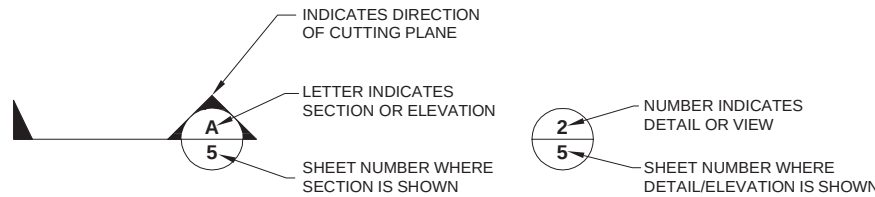
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DETAIL / VIEW TITLE

SCALE: 1"=40'

1
5

SECTION/ELEVATION/DETAIL/VIEW LABELS



SECTION

DETAIL

SECTION/ELEVATION/DETAIL/VIEW IDENTIFIERS

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NO.	DATE	BY	REVISION

TAXIWAY F CLEANUP ACTION PROJECT

Port of Skagit County

COVER SHEET

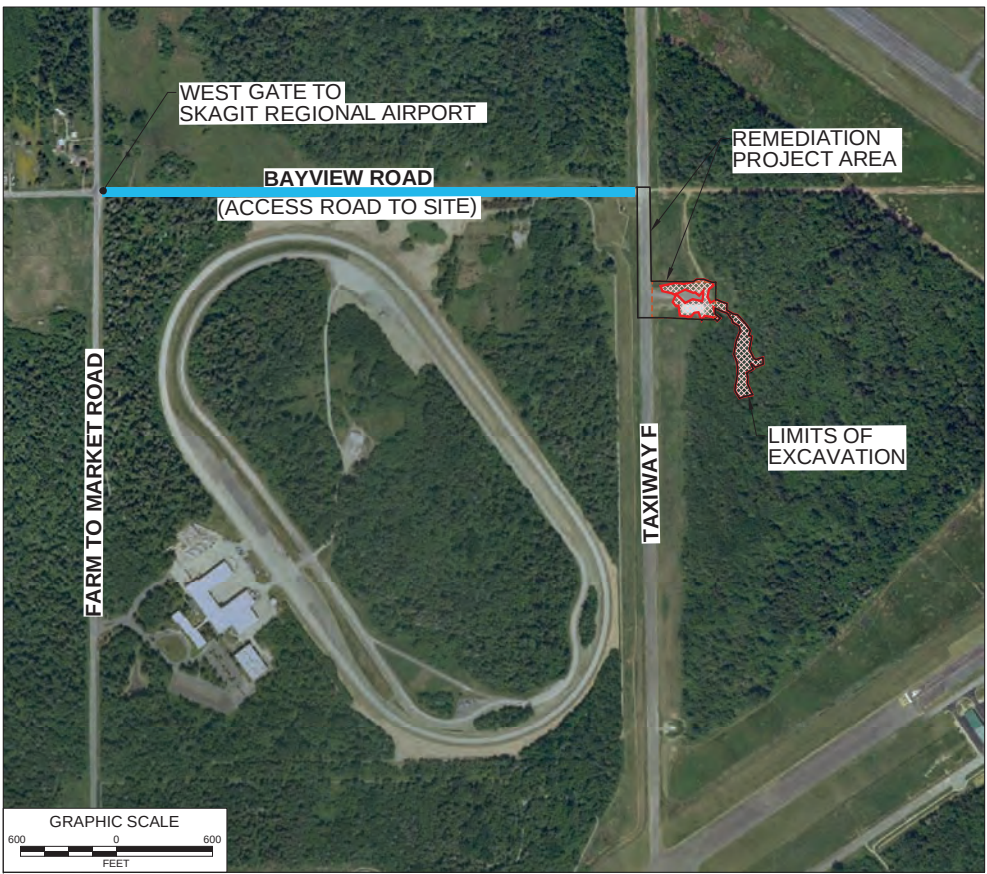
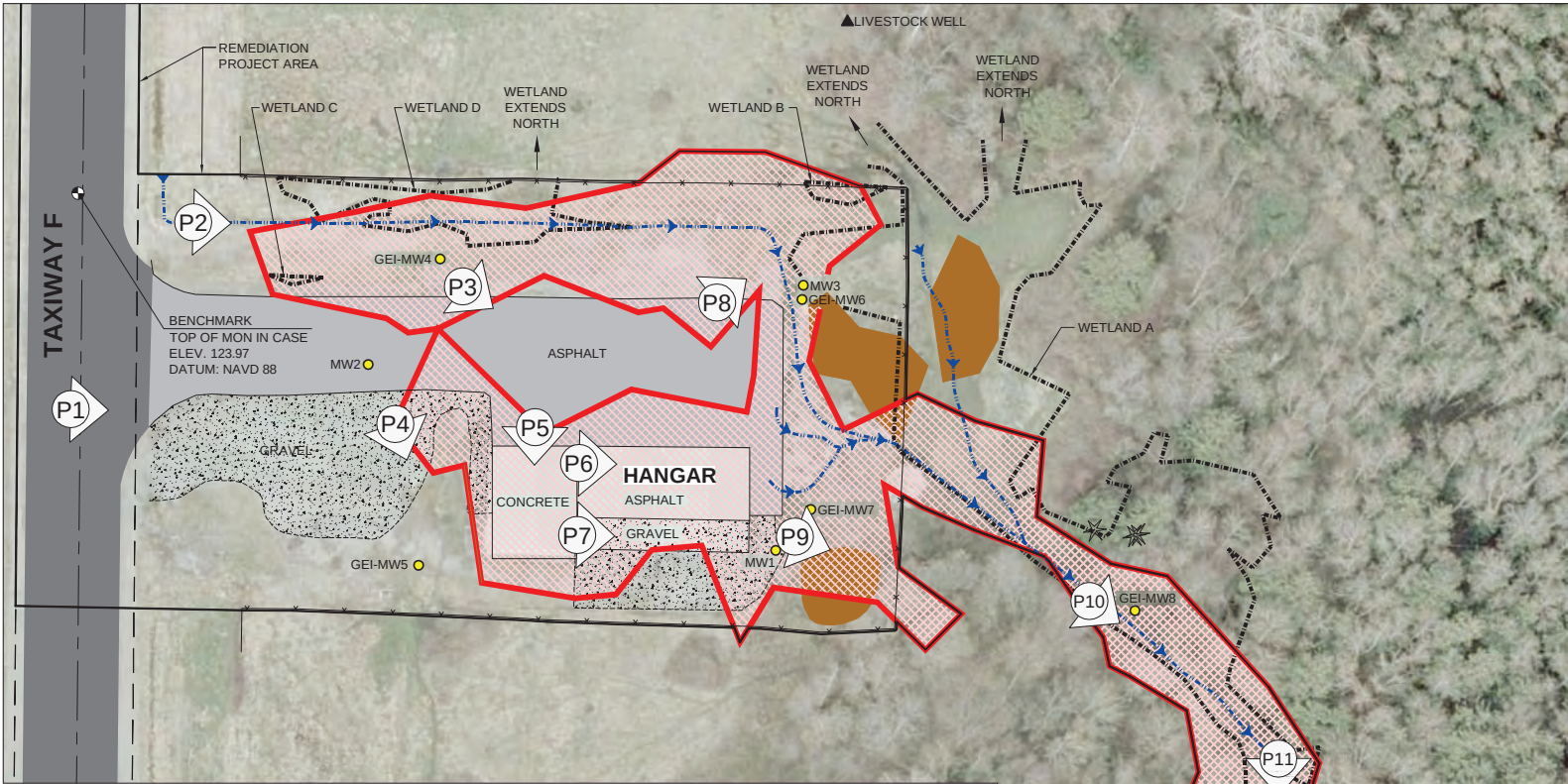
DRAWN: TJM	PROJECT NO. 536401303
DESIGN: AJ	SCALE: N.T.S.
CHECKED:	DATE: 7/13/2011
SHEET NO.	

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CONTRACT DRAWINGS

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PROJECT OVERVIEW



LEGEND

EXISTING WETLAND AREAS
(BASED ON HART CROWSER 2007 SURVEY)

EXISTING DRAINAGE CHANNEL
(APPROXIMATE RAINWATER RUNOFF FLOW DIRECTION)

DIRECTION OF PHOTOGRAPH
PHOTOGRAPH NUMBER

BENCHMARK

- NOTES**
1. PHOTOGRAPHS SHOWN ON SHEET 3
 2. AERIAL PHOTOS FROM AERIALS EXPRESS, SEATTLE, 2009 AND SKAGIT COUNTY DATED 2004.

PROJECT SUMMARY

OVERLAY ASPHALT PRIOR TO COMMENCING REMEDIAL EXCAVATION ACTIVITIES FOR USE AS HAUL ROUTE FOR CONSTRUCTION VEHICLE/TRUCKS AND TRAILERS DURING THE PROJECT.

ERECT EROSION AND SEDIMENT CONTROLS PRIOR TO REMEDIAL EXCAVATION AND MAINTAIN UNTIL FINAL SITE STABILIZATION IS ACHIEVED.

DECOMMISSION MONITORING WELLS PRIOR TO EXCAVATION WORK

PROJECT LIVESTOCK WELL PRIOR TO EXCAVATION WORK

PROTECT MATURE CEDAR/FIR TREES

REMOVE EXISTING FENCE (AS REQUIRED) AND RESTORE FOLLOWING THE COMPLETION OF EXCAVATION ACTIVITIES.

REMOVE DEBRIS FROM THE EXCAVATION AREA TO THE EXTENT NECESSARY TO ACCESS THE CONTAMINATED SOIL.

DEMOLISH ASPHALT AND CONCRETE SURFACES WITHIN THE HISTORICAL OPERATIONS AREA AND RESTORE FOLLOWING THE COMPLETION OF EXCAVATION ACTIVITIES.

PROTECT HANGAR BUILDING AND REMOVE FLOOR SURFACES TO ALLOW REMOVAL OF CONTAMINATED SOIL

EXCAVATE CONTAMINATED SOIL. EXCAVATED AREAS WILL BE RESTORED TO MATCH THE APPROXIMATE ORIGINAL TOPOGRAPHY, FEATURES, SURFACES AND VEGETATION

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CHRISTOPHER LEWIS
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

NO.	DATE	BY	REVISION

TAXIWAY F CLEANUP ACTION PROJECT
Port of Skagit County
PROJECT OVERVIEW

DRAWN: TJM	PROJECT NO. 536401303
DESIGN: AJ	SCALE:
CHECKED:	DATE: 7/13/2011
SHEET NO.	2

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P1 VIEW OF TAXIWAY F, ASPHALT DRIVEWAY
AND SIDE VIEW OF HANGAR BUILDING;
LOOKING EAST
(MARCH 2011)



P2 VIEW OF DRAINAGE CHANNEL
(NORTH OF ASPHALT DRIVEWAY);
LOOKING EAST
(MARCH 2011)



P3 FRONT VIEW OF HANGAR BUILDING
AND ASPHALT DRIVEWAY;
LOOKING SOUTHEAST
(MARCH 2011)



P4 VIEW OF WESTERN WALL OF HANGAR BUILDING
AND SURROUNDING AREAS;
LOOKING SOUTHEAST
(OCTOBER 2009)



P5 INSIDE VIEW OF THE HANGAR BUILDING
(CONCRETE PORTION)
CONTENTS INSIDE OF BUILDING TO BE
REMOVED PRIOR TO CONSTRUCTION;
LOOKING SOUTH
(MARCH 2011)



P6 INSIDE VIEW OF THE HANGAR BUILDING
(ASPHALT PORTION)
CONTENTS INSIDE OF BUILDING TO BE
REMOVED PRIOR TO CONSTRUCTION;
LOOKING EAST
(MARCH 2011)



P7 VIEW OF THE OPEN PORTION
OF THE HANGAR BUILDING
(GRAVEL PORTION);
LOOKING EAST
(MARCH 2011)



P8 VIEW OF THE NORTHEAST CORNER OF FENCED
AREA AND MONITORING WELL GEI-MW6 AND MW3;
LOOKING NORTHEAST
(NOVEMBER 2009)



P9 VIEW OF THE SOUTHEAST CORNER
OF FENCED AREA;
LOOKING SOUTHEAST
(SEPTEMBER 2009)



P10 VIEW OF MONITORING WELL GEI-MW8
AND SURROUNDING AREAS;
LOOKING SOUTHEAST
(MARCH 2011)



P11 VIEW OF DRAINAGE CHANNEL WITHIN WETLAND A;
LOOKING SOUTH
(MARCH 2011)



P12 VIEW OF MATURE CEDAR/FIR TREES
(TO BE PROTECTED);
LOOKING SOUTHEAST
(SEPTEMBER 2009)

NO.	DATE	BY	REVISION

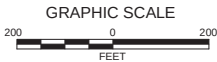
TAXIWAY F CLEANUP ACTION PROJECT Port of Skagit County
PROJECT OVERVIEW PHOTOS

DRAWN: TJM	PROJECT NO.536401303
DESIGN: AJ	SCALE:
CHECKED:	DATE: 7/13/2011
SHEET NO.	3

P:\1515364\013103\CAD\SH_4 CONTRACTOR PHASING AND TRAFFIC PLAN.DWG\TAB-LAYOUT3-LAYOUT1 MODIFIED BY THICHAUD ON JUL 14, 2011 - 10:48



CONTRACTOR PHASING AND TRAFFIC CONTROL PLAN



PHASING NOTES:

- CLOSURE OF TAXIWAY F WILL BE ALLOWED THROUGHOUT DURATION OF PROJECT. THE REMAINDER OF THE AIRPORT IS TO REMAIN OPEN TO AIRCRAFT OPERATIONS DURING ENTIRE COURSE OF WORK. CONTRACTOR SHALL COORDINATE WORK TO ASSURE MINIMUM INCONVENIENCE TO AIRPORT OPERATIONS. IN ALL CIRCUMSTANCES SAFETY SHALL TAKE PRECEDENCE.
- A NOTICE TO AIRMEN (NOTAM) CLOSING TAXIWAY F WILL BE REQUIRED PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY PORT OF SKAGIT WITH REQUESTS FOR NOTAMS 48 HOURS PRIOR TO IMPLEMENTATION. CLOSURES ARE SUBJECT TO APPROVAL BY PORT OF SKAGIT.

CONSTRUCTION SAFETY NOTES:

- GENERAL REQUIREMENTS
THROUGHOUT THE CONSTRUCTION PROJECT, THE FOLLOWING SAFETY AND OPERATIONAL PRACTICES SHALL BE OBSERVED IN ADDITION TO THE CONTRACTOR HEALTH AND SAFETY PLAN:
 - OPERATIONAL SAFETY WILL BE A STANDING AGENDA ITEM DURING PROGRESS MEETINGS
 - THE CONTRACTOR SHALL PERFORM DAILY SAFETY INSPECTIONS THROUGHOUT THE PROJECT, AND IMMEDIATELY REMEDY ANY DEFICIENCIES
 - CONTRACTOR, SUBCONTRACTOR, AND SUPPLIERS ARE RESTRICTED FROM ALL AIRCRAFT OPERATIONAL AREAS (AOA) EXCEPT THOSE CLOSED BY

NOTAM UNLESS UNDER ESCORT BY AUTHORIZED AIRPORT PERSONNEL

- PORT OF SKAGIT, GEOENGINEERS/PAE, OR OTHER DESIGNATED AIRPORT REPRESENTATIVE MAY ORDER THE CONTRACTOR TO SUSPEND OPERATIONS AND MOVE PERSONNEL, EQUIPMENT, AND MATERIALS TO A SAFE LOCATION IF IT IS DETERMINED A HAZARDOUS SITUATION EXISTS
- THE CONTRACTOR AND SUBCONTRACTORS SHALL BE REQUIRED TO OBSERVE ALL SAFETY REQUIREMENTS. PERSONNEL WHO VIOLATE SAFETY PROCEDURES MAY BE RESTRICTED OR BARRED FROM WORK WITHIN AIRCRAFT OPERATION AREAS.

2. CONSTRUCTION ACTIVITIES

BEFORE BEGINNING ANY CONSTRUCTION ACTIVITY THE CONTRACTOR SHALL CONFIRM, THROUGH PORT OF SKAGIT, THAT THE APPROPRIATE NOTICE TO AIRMEN (NOTAM) HAS BEEN ISSUED. UPON COMPLETION OF WORK AND RETURN OF AREAS TO REQUIRED AIRPORT OPERATIONAL CONDITIONS, THE CONTRACTOR SHALL CONFIRM, THROUGH THE AIRPORT OPERATOR, THAT APPROPRIATE NOTAMS HAVE BEEN CANCELED.

THROUGHOUT DURATION OF THE CONSTRUCTION PROJECT, THE CONTRACTOR SHALL:

- BE AWARE OF THE SAFETY PROBLEMS AND HAZARDS DESCRIBED IN AC 150/5370-2, "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION"

AND CONDUCT ACTIVITIES SO THAT THESE STANDARDS ARE NOT VIOLATED

- INSPECT ALL CONSTRUCTION AND STORAGE AREAS AS OFTEN AS NECESSARY TO ASSURE COMPLIANCE WITH CONTRACT REQUIREMENTS
- PROMPTLY TAKE ALL ACTIONS NECESSARY TO PREVENT OR REMEDY ANY UNSAFE OR POTENTIALLY UNSAFE CONDITIONS AS SOON AS THEY ARE DISCOVERED

3. HAZARDOUS AREA MARKING AND LIGHTING

BARRICADES NOTED ON THE DRAWINGS AS PORT OF SKAGIT PROVIDED SHALL BE PLACED AND MAINTAINED BY THE CONTRACTOR AT VARIOUS LOCATIONS AS NECESSARY TO ADEQUATELY AND SEPARATE CONSTRUCTION ACTIVITIES FROM AIRCRAFT OPERATIONS AREAS (AOA). BARRICADES SHOWN ON THE DRAWINGS AS PORT OF SKAGIT PROVIDED ARE FOR REFERENCE AND THE NUMBER AND LOCATION OF BARRICADES MAY CHANGE TO MEET SAFETY REQUIREMENTS AS DETERMINED BY PORT OF SKAGIT. DURING PERIODS OF LOW VISIBILITY AND AT NIGHT, IDENTIFY HAZARDOUS AREAS WITH PORT OF SKAGIT PROVIDED FAA APPROVED RED FLASHING LIGHTS. VEHICLE STROBE LIGHT OR FLAG REQUIRED ON VEHICLE USED TO PLACE AND CHECK BARRICADE AT FAR END OF RUNWAY. PORT OF SKAGIT'S REPRESENTATIVE ON-HAND DURING PLACEMENT.

4. VEHICLE MARKING, OPERATION AND CONTROL

VEHICLES MUST BE PROPERLY MARKED WITH COMPANY NAME OR LOGO.

VEHICULAR OR PEDESTRIAN TRAFFIC SHALL NOT APPROACH OR CROSS ANY RUNWAY OR AREA OF THE AIRPORT OUTSIDE THE CONSTRUCTION LIMITS SHOWN ON THE DRAWINGS.

ALL VEHICLES NOT ESSENTIAL FOR CONSTRUCTION, INCLUDING CONTRACTOR-EMPLOYEE VEHICLES, SHALL REMAIN OUTSIDE OF THE AIRCRAFT OPERATIONS AREAS. PARKING SHALL BE IN THE CONTRACTOR'S STAGING AREA. FAILURE TO ADHERE TO THIS REQUIREMENT CONSTITUTES A SAFETY VIOLATION.

5. DEBRIS

THE CONTRACTOR SHALL CONSTANTLY MAINTAIN AOA FREE OF CONSTRUCTION DEBRIS, INCLUDING ROCKS, SAND, AND DUST OUTSIDE OF THE PROJECT AREA. THIS MAY REQUIRE SURFACE CLEANING SEVERAL TIMES DURING A WORK PERIOD. THE CONTRACTOR SHALL MAINTAIN A TRASH RECEPTACLE TO PREVENT TRASH FROM BEING BLOWN OR TRANSPORTED WITHIN THE AOA.

6. GATE GUARD

THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A GATE GUARD ANY TIME MATERIAL DELIVERY, HAULING, OR OTHER CONSTRUCTION ACTIVITIES REQUIRE LEAVING A GATE OPEN THAT PROVIDES ACCESS TO THE AIRPORT.



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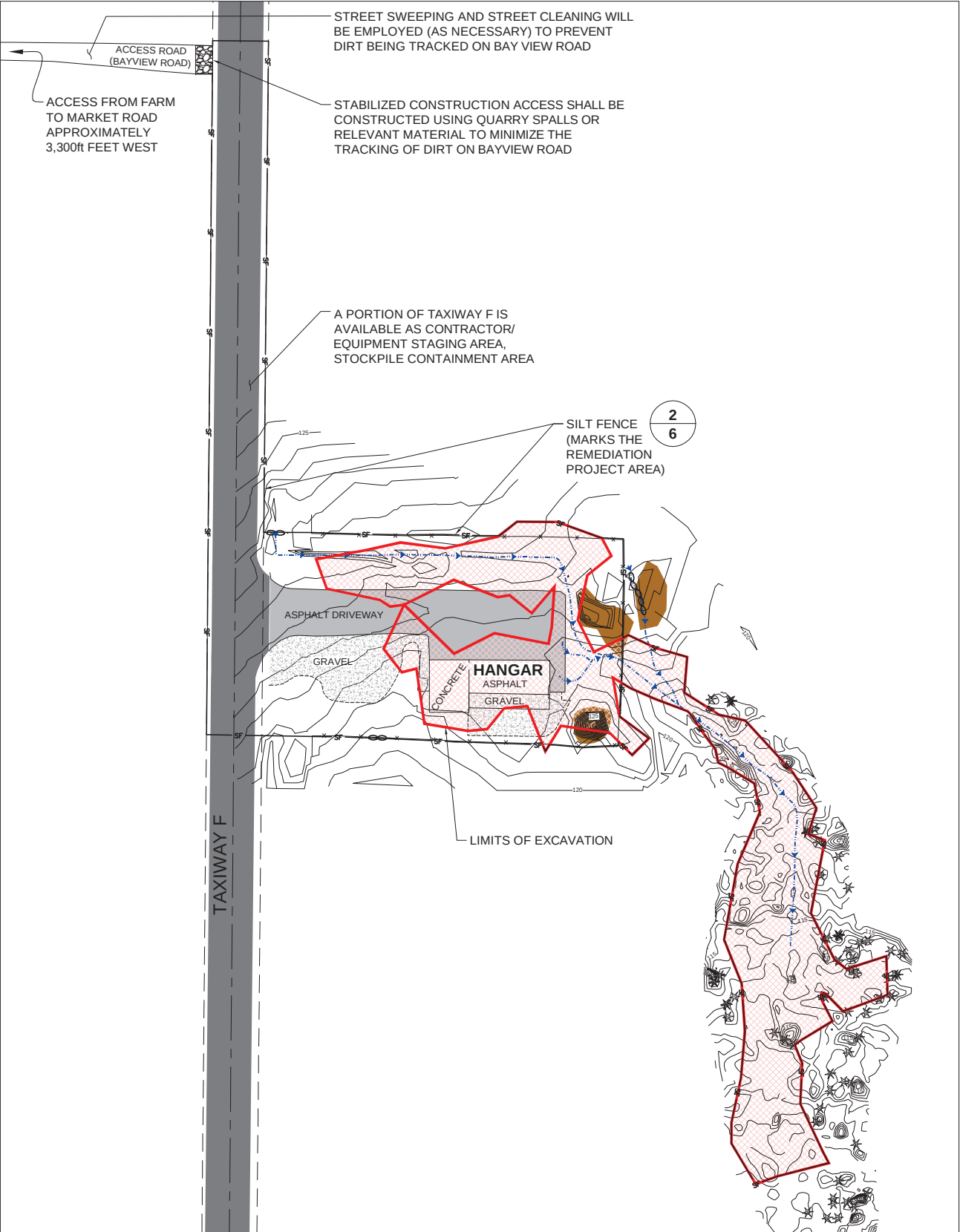
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TAXIWAY F CLEANUP ACTION PROJECT
Port of Skagit County
CONTRACTOR PHASING AND TRAFFIC CONTROL PLAN

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DESIGN: AJ	SCALE: 1"=200'
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SHEET NO.	4

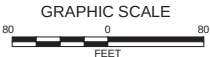
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EROSION AND SEDIMENT CONTROL PLAN

SCALE: 1"=80'



LEGEND

- SILT FENCE (CLEARING LIMITS)
- SAND BAGS
- ASPHALT SURFACE
- GRAVEL SURFACE
- LIMITS OF EXCAVATION
- EXISTING FENCE LINE
- DRAINAGE CHANNEL (APPROXIMATE RAINWATER RUNOFF FLOW DIRECTION)
- EXISTING TOPOGRAPHIC CONTOUR (ELEVATION IN FEET, 0.5' INTERVALS)
- MATURE CEDAR / FIR TREE TO BE PROTECTED

GENERAL NOTES FOR EROSION AND SEDIMENT CONTROL

- BEST MANAGEMENT PRACTICES (BMPs) FOR TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) AND STORMWATER MANAGEMENT TO BE EMPLOYED DURING CONSTRUCTION ARE OUTLINED IN THE ECOLOGY-APPROVED STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE PROJECT. THE ECOLOGY CONSTRUCTION STORMWATER GENERAL PERMIT (CSWGP) SHALL BE TRANSFERRED TO AND MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF THE PROJECT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS REQUIRED IN THE CSWGP AND SWPPP.
- THE BOUNDARIES OF CLEARING LIMITS SHOWN ON THE PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION. OUTSIDE THE CLEARING LIMITS, NATURAL VEGETATION AND NATIVE TOPSOIL AND VEGETATION WILL BE RETAINED IN AN UNDISTURBED STATE TO THE MAXIMUM EXTENT POSSIBLE.
- CONTRACTOR SHALL IMPLEMENT ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES REQUIRED DURING ALL CONSTRUCTION ACTIVITIES, INCLUDING BUT NOT LIMITED TO:
 - MAINTAIN ON HAND ALL EQUIPMENT AND MATERIALS REQUIRED TO IMPLEMENT TESC MEASURES
 - CLEARING LIMITS SHALL BE MARKED PRIOR TO INITIATING CONSTRUCTION ACTIVITIES AND MAINTAINED THROUGH THE DURATION OF CONSTRUCTION
 - CONTRACTOR SHALL IMPLEMENT DUST CONTROL MEASURES IF CONDITIONS ARE DRY AND THERE IS RISK OF WIND TRANSPORTING DUST FROM DISTURBED SURFACES.
 - INSTALL SILT FENCE AND/OR STRAW WATTLES AS APPLICABLE FOR SEDIMENT CONTROL. SEE SHEET 6 FOR EROSION AND SEDIMENT CONTROL DETAILS.
 - MINIMIZE ACCESS TO SITE ON UNPAVED AREAS. AS APPROVED BY PORT OF SKAGIT, UNPAVED AREAS USED AS ACCESS POINTS SHALL BE STABILIZED USING QUARRY SPALLS OR OTHER RELEVANT MATERIAL TO MINIMIZE THE TRACKING OF SEDIMENT ONTO ADJACENT TAXIWAYS AND ROADS AND MIXING OF THE CONTAMINATED SOILS WITH THE CLEAN UNDERLYING MATERIAL. THE EXISTING ASPHALT DRIVEWAY SHALL BE UTILIZED FOR ALL CONSTRUCTION EGRESS, TO THE EXTENT PRACTICAL.
- STREET SWEEPING AND STREET CLEANING SHALL BE EMPLOYED BY CONTRACTOR TO PREVENT SEDIMENT FROM BEING TRACKED OFF SITE. VISUAL MONITORING OF THE BMPs WILL BE CONDUCTED BY THE CONTRACTOR'S SITE CESCL INSPECTOR AT LEAST ONCE EVERY CALENDAR WEEK AND WITHIN 24 HOURS OF ANY RAINFALL EVENT THAT CAUSES A DISCHARGE FROM THE SITE. THE CONTRACTOR'S CESCL INSPECTOR SHALL EVALUATE AND DOCUMENT THE EFFECTIVENESS OF THE INSTALLED BMPs AND DETERMINE IF IT IS NECESSARY TO REPAIR, REPLACE OR ADD ANY OF THE BMPs TO IMPROVE THE QUALITY OF STORMWATER DISCHARGES. IF THE SITE BECOMES INACTIVE, AND IS TEMPORARILY STABILIZED, THE INSPECTION FREQUENCY WILL BE REDUCED TO ONCE EVERY MONTH.
- THE CONTRACTOR, AS THE HOLDER OF THE CSWGP, WILL BE REQUIRED TO SUBMIT WEEKLY REPORTS TO ECOLOGY SUMMARIZING THE MEASURES TAKEN TO MEET THE PERMIT CONDITIONS. CONTRACTOR SHALL SUBMIT A COPY OF ALL REPORTS TO PORT OF SKAGIT.
- CONTRACTOR SHALL REMOVE TESC BMPs WITHIN 30 DAYS AFTER THE FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPs ARE NO LONGER NEEDED. DISTURBED SOIL RESULTING FROM REMOVAL OF BMPs OR VEGETATION WILL BE PERMANENTLY STABILIZED.



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NO.	DATE	BY	REVISION

TAXIWAY F CLEANUP ACTION PROJECT

Port of Skagit County

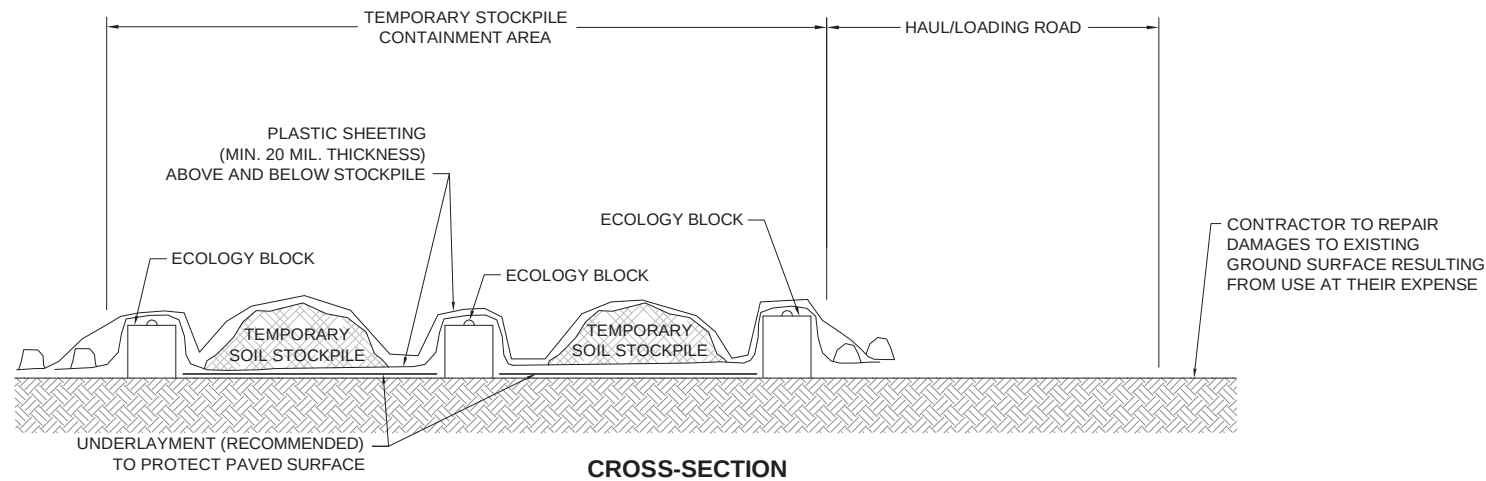
EROSION AND SEDIMENT CONTROL PLAN

DRAWN: TJM	PROJECT NO.:536401303
DESIGN: AJ	SCALE: 1"=80'
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CONTRACT DRAWINGS

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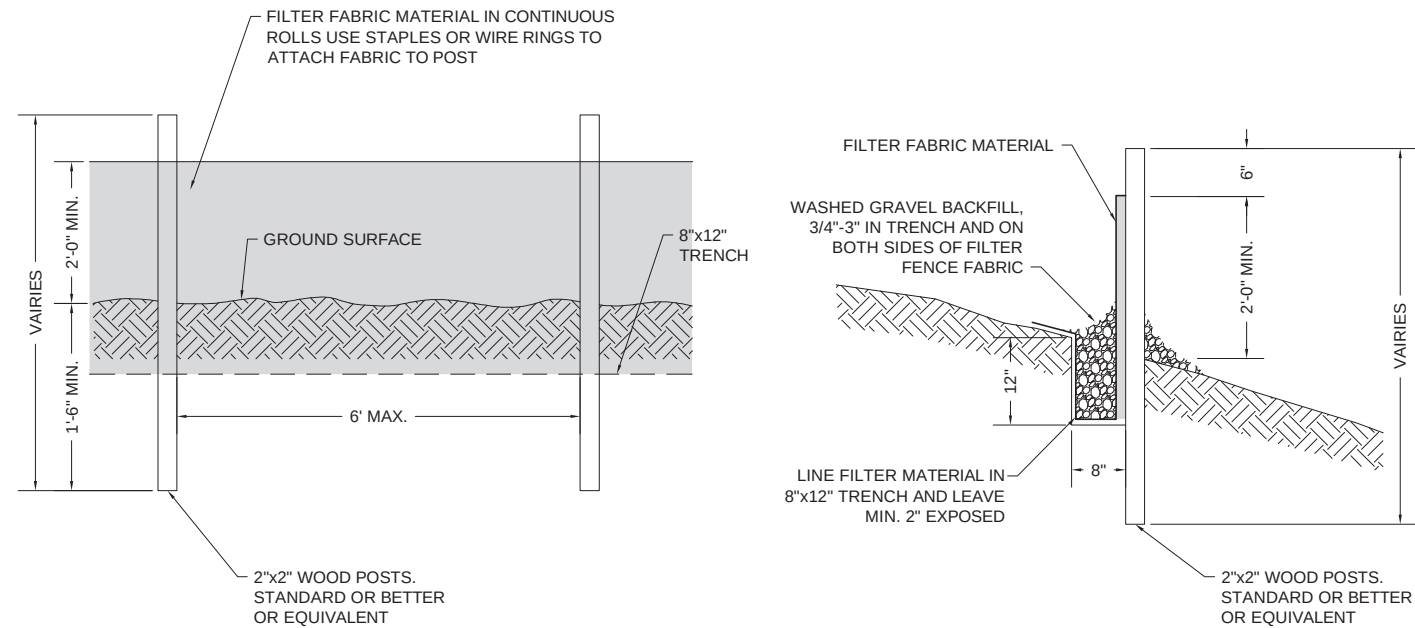


- NOTES:
1. STOCKPILED SOIL WILL BE COVERED AND SECURED FROM WIND, RAIN, AND OTHER DISTURBANCES AT ALL TIMES EXCEPT DURING ACTIVE SOIL LOADING AND UNLOADING.
 2. EROSION CONTROL MEASURES, AS DESCRIBED ON SHEET 5 SHALL BE IN PLACE AT ALL TIMES DURING USE OF STOCKPILE AREAS.
 3. WATER COLLECTED WITHIN THE STOCKPILE AREAS MUST BE CONTAINED AS DESCRIBED IN THE SWPPP. CONTRACTOR SHALL REMOVE WATER WITHIN THE STOCKPILE AREAS BY PUMPING TO A CONTAINMENT VESSEL FOR ANALYSIS TO DETERMINE PROPER DISPOSAL. CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF COLLECTED WATER IN THE STOCKPILE AREA.

TEMPORARY STOCKPILE CONTAINMENT AREA DETAIL

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SILT FENCE DETAIL

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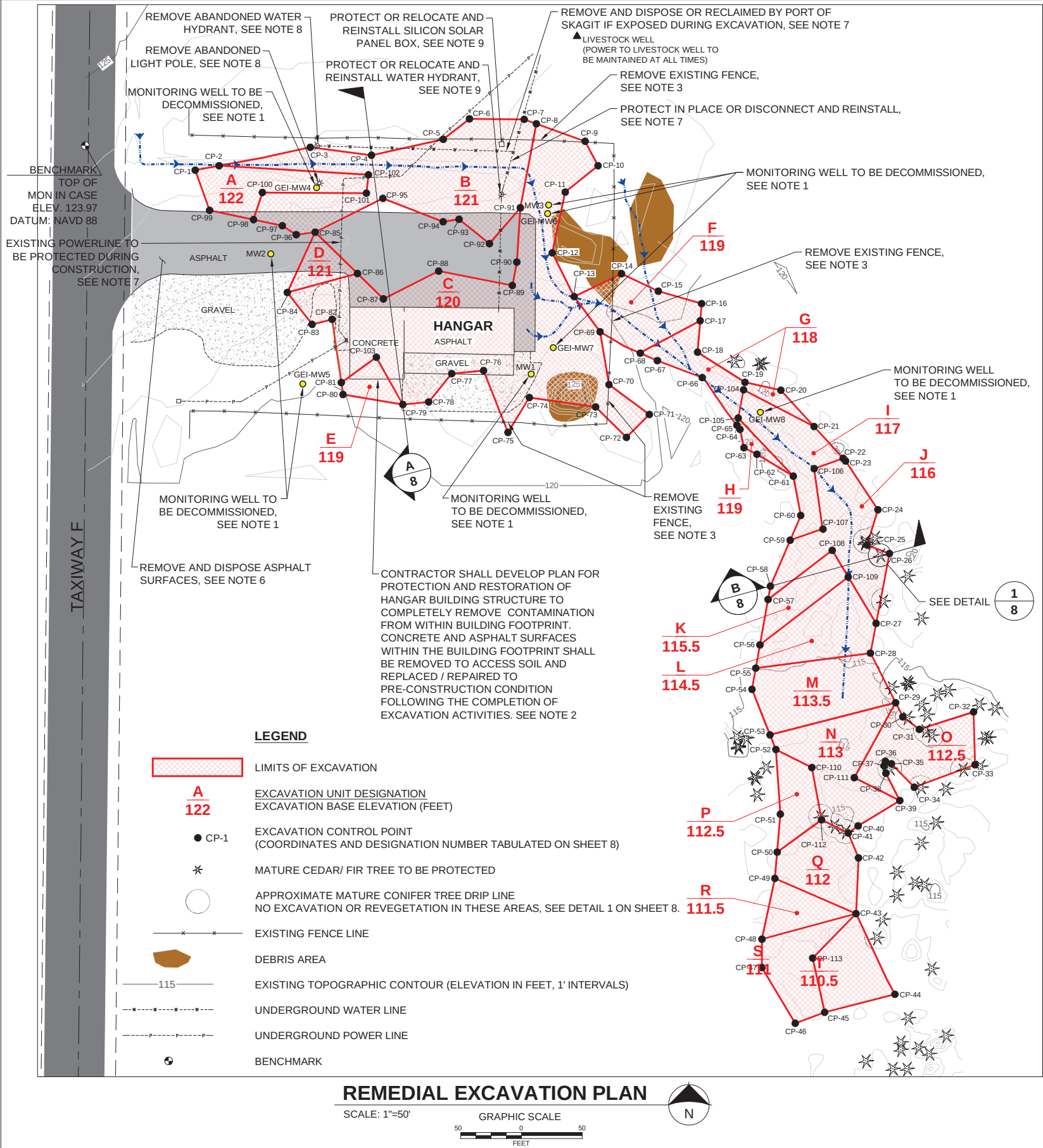
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NO.	DATE	BY	REVISION

TAXIWAY F CLEANUP ACTION PROJECT
Port of Skagit County
EROSION AND SEDIMENT CONTROL DETAILS

DRAWN: TJM	PROJECT NO. 536401303
DESIGN: AJ	SCALE:
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SHEET NO.	6

P:\1515364013\CAD\SHEET\SH.7 REMEDIAL EXCAVATION PLAN.DWG\TAB:Layout3-Layout1 MODIFIED BY TMICHAUD ON JUL 14, 2011 - 10:52



NOTES:

DEMOLITION AND SITE PREPARATION NOTES

- PRIOR TO COMMENCING REMEDIAL EXCAVATION ACTIVITIES, CONTRACTOR SHALL DECOMMISSION SHALLOW MONITORING WELLS GEI-MW4, GEI-MW5, GEI-MW6, GEI-MW7, AND GEI-MW8 AND DEEP MONITORING WELLS (MW1, MW-2 AND MW-3) IN ACCORDANCE WITH ECOLOGY'S REGULATIONS. LIVESTOCK WELL SHALL BE PROTECTED DURING CLEANUP ACTION CONSTRUCTION ACTIVITIES. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGES TO LIVESTOCK WELL AND WILL BE RESPONSIBLE FOR RESTORING THE WELL TO ITS ORIGINAL CONDITION IN ACCORDANCE WITH ECOLOGY'S REQUIREMENTS.
- CONTRACTOR SHALL DEVELOP A PLAN FOR PROTECTION AND RESTORATION OF THE HANGAR BUILDING STRUCTURE THAT ALLOWS COMPLETE REMOVAL OF CONTAMINATED SOIL. CONCRETE AND ASPHALT FLOOR WITHIN THE HANGAR BUILDING WILL BE DEMOLISHED TO ACCESS THE CONTAMINATED SOIL. THE BUILDING STRUCTURE MAY BE LEFT IN PLACE AND PROTECTED OR MOVED FROM THE EXISTING LOCATION, BUT THE EXISTING STRUCTURE MUST BE RETURNED TO THE CURRENT LOCATION FOLLOWING COMPLETION OF REMEDIAL EXCAVATION AND RESTORED TO ITS PRE-CONSTRUCTION CONDITION. REPLACEMENT OF THE BUILDING FLOOR WILL BE REQUIRED. THE CONTRACTOR SHALL PREPARE AN "EXCAVATION AND DISPOSAL PLAN" FOR APPROVAL BY PORT OF SKAGIT THAT OUTLINES THE CONTRACTOR'S METHODS FOR PERFORMING REMEDIAL EXCAVATION INCLUDING EXCAVATION WITHIN THE HANGAR BUILDING AND PROCEDURES FOR PROTECTING AND/OR RESTORING THE HANGAR BUILDING DURING AND FOLLOWING THE CLEANUP ACTION CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL REPLACE BUILDING FLOOR AS DESCRIBED ON SHEET 9 AND 12.
- CONTRACTOR SHALL REMOVE EXISTING FENCING TO THE EXTENT REQUIRED TO COMPLETE THE CLEANUP ACTION ACTIVITIES. FENCING WILL BE REPLACED OR RESTORED TO ITS ORIGINAL LOCATION AND CONDITION.
- CONTRACTOR SHALL CLEAR AND GRUB VEGETATED/FORESTED AREAS TO THE LIMITS SHOWN.
 - CONTRACTOR SHALL PROTECT MATURE CONIFERS (CEDAR AND FIR) SHOWN ON DRAWING BY PREVENTING DISTURBANCE OF GROUND SURFACE WITHIN THE TREES DRIPLINE, INCLUDING INSTALLATION OF TEMPORARY FEATURES, DRIVING AND/OR STORING EQUIPMENT AND MATERIALS, AND EXCAVATION OF SOIL. SEE SHEET 8 FOR TYPICAL OF EXCAVATION IN THE VICINITY TO EXISTING MATURE CEDAR/FIR TREES.
 - TREE STUMPS MUST BE EITHER PULLED OUT OR GROUND DOWN TO THE ANTICIPATED DEPTH OF THE REMEDIAL EXCAVATION. STUMPS AND ROOTS EXTENDING DEEPER THAN THE ANTICIPATED EXCAVATION DEPTH SHALL BE CUT OFF AT THE ANTICIPATED EXCAVATION DEPTH TO AVOID REMOVING EXCESS SOIL.
 - CONTAMINATED VEGETATION INCLUDING BUT NOT LIMITED TO, REMOVED ROOTS/STUMPS OF TREES WILL BE DISPOSED OF WITH THE CONTAMINATED SOIL TO A PERMITTED DISPOSAL FACILITY APPROVED BY PORT OF SKAGIT. CONTAMINATED VEGETATION CAN BE MIXED WITH CONTAMINATED SOIL AS IS OR AFTER CHIPPING/GRINDING INTO SMALLER PIECES FOR EXPORT AS PER THE REQUIREMENT OF DISPOSAL FACILITY. STOCKPILING OF CONTAMINATED VEGETATION WILL BE CONDUCTED AS SHOWN ON SHEET 6.
 - UNSOILED VEGETATION LESS THAN 6 INCHES IN DIAMETER WILL BE CHIPPED ON SITE AND STOCKPILED SEPARATELY FOR USE AS MULCH TO OVERTOP THE FINISHED BACKFILLED PORTIONS OF EXCAVATION WITHIN THE FORESTED REGION, AS DIRECTED BY GEOENGINEERS. LOGS GREATER THAN 6 INCHES IN DIAMETER SHALL BE STOCKPILED FOR USE DURING BACKFILLING AND RE-VEGETATION. LOGS MAY BE CUT INTO SECTIONS OF APPROXIMATELY 8-FOOT LENGTHS, FOR THE PURPOSE OF HANDLING. SALVAGED LOGS WILL BE USED AS HABITAT LOGS AND WILL BE PLACED OVER THE FINISHED BACKFILL GRADE WITHIN THE FORESTED WETLAND AND FORESTED BUFFER AREAS AS DIRECTED BY GEOENGINEERS. FINISHED MULCH SHALL BE STORED SEPARATELY FROM ALL CONTAMINATED MATERIALS.
- CONTRACTOR SHALL REMOVE DEBRIS WITHIN EXCAVATION AREAS TO THE EXTENT NECESSARY TO ACCESS CONTAMINATED SOILS. DEBRIS SHALL BE TRANSPORTED OFF-SITE FOR DISPOSAL OR RELOCATED TO ANOTHER LOCATION WITHIN THE SITE AT PORT OF SKAGIT'S DIRECTION.
- CONTRACTOR SHALL REMOVE ASPHALT SURFACES WITHIN THE FENCED AREA, EAST OF TAXIWAY F AND PREPARE SURFACE FOR ASPHALT REPLACEMENT. CONTRACTOR SHALL TRANSPORT ASPHALT DEBRIS OFFSITE FOR DISPOSAL AT PORT OF SKAGIT-APPROVED DISPOSAL FACILITY. ASPHALT AND CONCRETE SURFACES SHALL BE RESTORED AS DESCRIBED ON SHEET 9 AND 12.
- PRIOR TO EXCAVATION, UNDERGROUND UTILITIES WILL BE LOCATED IN FIELD BY THE PORT OF SKAGIT. CURRENTLY KNOWN UNDERGROUND UTILITIES AT THE SITE INCLUDE AN UNDERGROUND POWER LINE, A PREVIOUSLY ABANDONED PROPANE LINE, AND AN UNDERGROUND WATER LINE. DURING THE REMEDIAL EXCAVATION AND BACKFILL ACTIVITIES, CONTRACTOR SHALL PROTECT UTILITIES IN PLACE OR DISCONNECT AND REINSTALL/RESTORE UTILITIES FOLLOWING THE COMPLETION OF CONSTRUCTION ACTIVITIES WITH FOLLOWING EXCEPTIONS. THE POWER LINE FEEDING THE ABANDONED LIGHT POLE, THE PREVIOUSLY ABANDONED PROPANE LINE, AND THE PORTION OF WATER LINE FEEDING THE ABANDONED WATER HYDRANT WILL BE REMOVED AND TRANSPORTED OFFSITE FOR DISPOSAL OR RECLAIMED BY PORT OF SKAGIT AND NOT REPLACED, IF EXPOSED DURING THE EXCAVATION. POWER TO THE LIVESTOCK WELL TO BE MAINTAINED AT ALL TIMES. CONTRACTOR WILL BE RESPONSIBLE FOR NOTIFYING RESPECTIVE AGENCIES AT LEAST THREE DAYS PRIOR TO CONDUCTING REMEDIAL EXCAVATION ACTIVITIES IN THE IMMEDIATE VICINITY OF UTILITIES AND SHALL BE RESPONSIBLE FOR OBTAINING NECESSARY INSPECTIONS.
- CONTRACTOR SHALL DEMOLISH AND DISPOSE OF THE ABANDONED LIGHT POLE AND WATER HYDRANT LOCATED IN THE VICINITY OF MONITORING WELL GEI-MW4.
- CONTRACTOR SHALL EITHER PROTECT IN PLACE OR DISMANTLE AND REINSTALL THE SILICON SOLAR PANEL BOX AND CURRENTLY FUNCTIONAL WATER HYDRANT LOCATED IN THE NORTHEAST PORTION OF THE HISTORICAL OPERATION AREA. FUNCTIONS OF SILICON SOLAR PANEL BOX AND ASSOCIATED ELECTRIC FENCE DISTURBED DURING THE CONSTRUCTION ACTIVITIES MUST BE RESTORED TO ITS ORIGINAL CONDITION FOLLOWING THE COMPLETION OF REMEDIAL EXCAVATION/RESTORATION ACTIVITIES.

REMEDIAL EXCAVATION NOTES

- REMEDIAL EXCAVATION ACTIVITIES AT SITE SHALL BE COMPLETED PRIOR TO NOVEMBER 1, 2011 OR BY A REVISED DATE AS APPROVED BY PORT OF SKAGIT.
- CONTRACTOR SHALL OUTLINE THE PROPOSED EXCAVATION PHASING IN THE "EXCAVATION AND DISPOSAL PLAN" TO BE SUBMITTED TO PORT OF SKAGIT FOR APPROVAL. THE SUGGESTED PHASING CONSISTS OF COMPLETING THE REMEDIAL EXCAVATION WITHIN THE HISTORICAL OPERATIONS AREA TO THE EXTENT PRACTICAL PRIOR TO BEGINNING EXCAVATION WORK IN THE ADJACENT UPLAND AND WETLAND AREAS LOCATED TO THE EAST AND SOUTH. THE CONTRACTOR MAY PRESENT ALTERNATIVE CONSTRUCTION PHASING TO PORT OF SKAGIT FOR APPROVAL.
- EXPECTED FINAL LATERAL LIMITS OF REMEDIAL EXCAVATION ARE ESTABLISHED BY THE CONTROL POINT (CP) LOCATIONS ON THE DRAWING. CONTRACTOR SHALL PLACE STAKE AT EACH CP LOCATIONS WITHIN EACH EXCAVATION UNIT PRIOR TO EXCAVATION.
- CONTRACTOR SHALL EXCAVATE EACH EXCAVATION UNIT TO ITS DESIGNATED EXCAVATION BASE ELEVATION OR AS DIRECTED BY GEOENGINEERS.
- CONTRACTOR SHALL MAINTAIN THE EXCAVATION BASE OPEN, ACCESSIBLE AND DRY WITHIN REASON FOR GEOENGINEERS TO COLLECT BASE VERIFICATION SOIL SAMPLES. FINAL VERTICAL LIMITS OF EXCAVATION WILL BE DICTATED BY CHEMICAL ANALYTICAL RESULTS OF BASE VERIFICATION SAMPLING AND THE EXCAVATION BASE MUST BE MAINTAINED OPEN UNTIL CHEMICAL ANALYTICAL VERIFICATION IS COMPLETED. ADDITIONAL-EXCAVATION BEYOND THE BASELINE EXCAVATION MAY BE REQUIRED BASED ON THE RESULTS OF BASE VERIFICATION SAMPLING.
- CONTINGENT ON ACTUAL SITE CONDITIONS, CONSTRUCTION OF STABILIZED HAULING ROUTES USING QUARRY SPALLS OR OTHER SIMILAR MATERIAL TO ACCESS REMEDIAL EXCAVATION AREAS AND TO HAUL MATERIALS INTO AND OUT OF AREAS OF EXCAVATION WILL BE REQUIRED.
- CONTRACTOR SHALL HANDLE AND TRANSPORT CONTAMINATED SOILS AND DEBRIS AS PER WASHINGTON STATE DANGEROUS WASTE REGULATIONS (WAC 173-303). TRUCKS, TRAILERS, AND CONTAINERS USED FOR HAULING CONTAMINATED MATERIAL TO OFFSITE PERMITTED DISPOSAL FACILITY SHALL BE LINED AND COVERED WITH PLASTIC LINER.
- TAXIWAY F WILL BE CLOSED DURING THE DURATIONS OF CLEANUP ACTION CONSTRUCTION ACTIVITIES AND PORTION OF TAXIWAY F, AS SHOWN ON SHEET 4 AND 5, WILL BE AVAILABLE FOR TEMPORARY STOCKPILING OF EXCAVATED MATERIAL (IF REQUIRED). AREAS USED TO TEMPORARILY STOCKPILE EXCAVATED MATERIAL SHALL BE LOCATED WITHIN THE ASPHALT SURFACES UNLESS OTHERWISE APPROVED BY THE PORT OF SKAGIT. THE CONTRACTOR MAY REQUEST ALTERNATIVE STOCKPILE LOCATIONS DURING CONSTRUCTION ACTIVITIES. ALTERNATIVE LOCATIONS MUST BE APPROVED BY PORT OF SKAGIT. EXCAVATED CONTAMINATED MATERIAL SHALL BE STOCKPILED AS SHOWN ON SHEET 6.
- BACKFILLING, GRADING AND PAVING WILL BE CONDUCTED ACCORDING TO SHEET 9 THROUGH 11.

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Bellingham, WA 98225
360-733-1567



NO.	DATE	BY	REVISION

TAXIWAY F CLEANUP ACTION PROJECT

Port of Skagit County

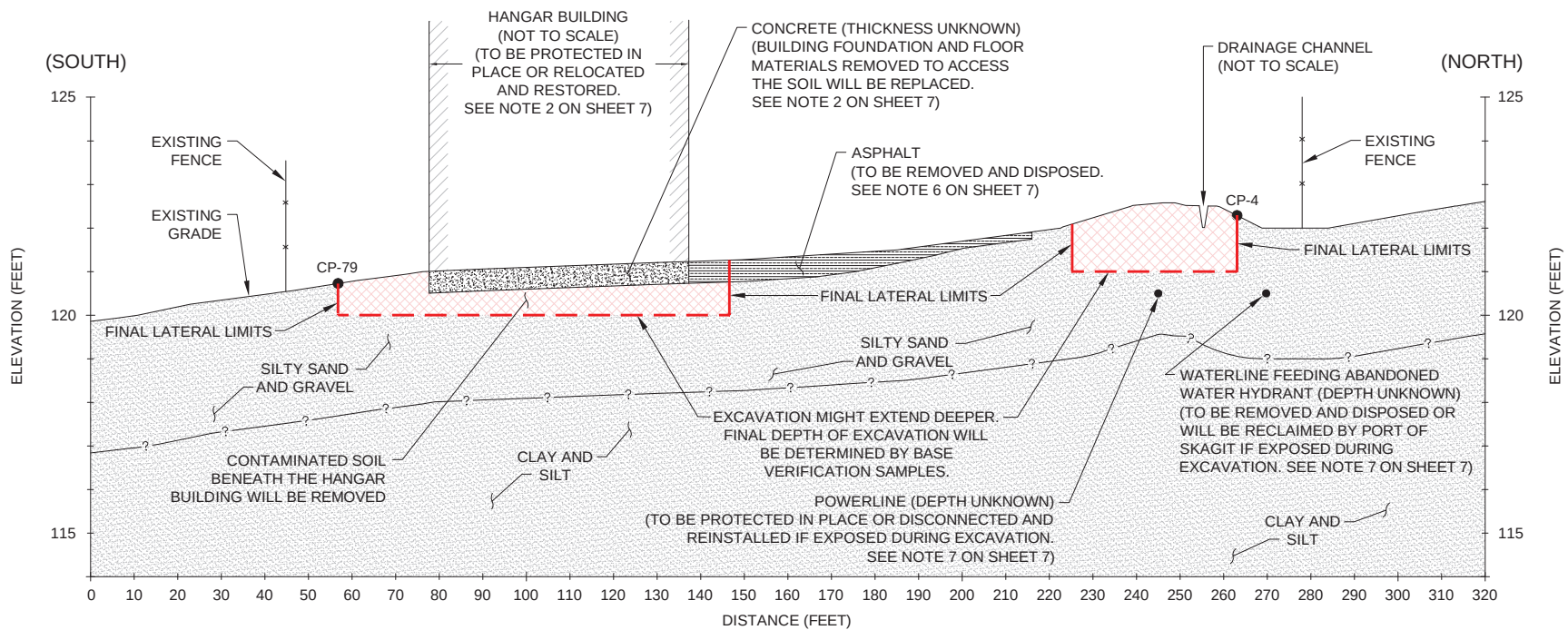
REMEDIAL EXCAVATION PLAN

DRAWN:	TJM	PROJECT NO.536401303
DESIGN:	AJ	SCALE: 1"=50'
CHECKED:		DATE: 7/13/2011
SHEET NO.		

7

CONTRACT DRAWINGS

P:\1515364013\103\CAD\SHEET\SH_8 REMEDIAL EXCAVATION DETAILS.DWG\TAB\Layout3-Layout1 Modified by Thichaud on Jul 14, 2011 - 10:53

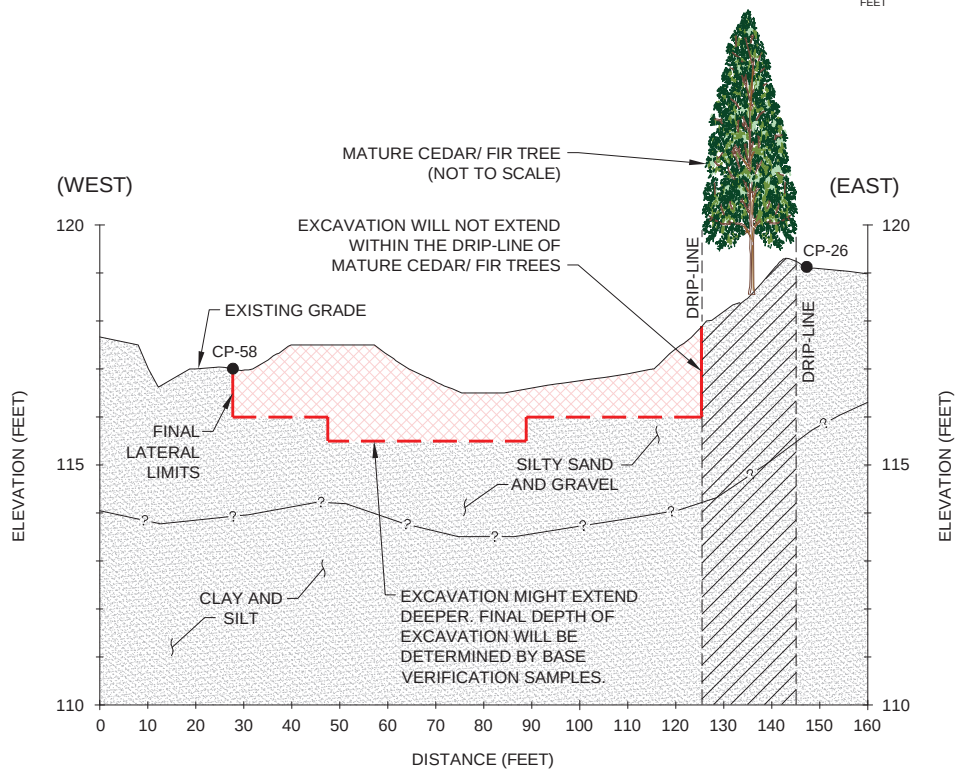


REMEDIAL EXCAVATION CROSS-SECTION

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=2'
VERTICAL EXAGGERATION: 10X

A

7

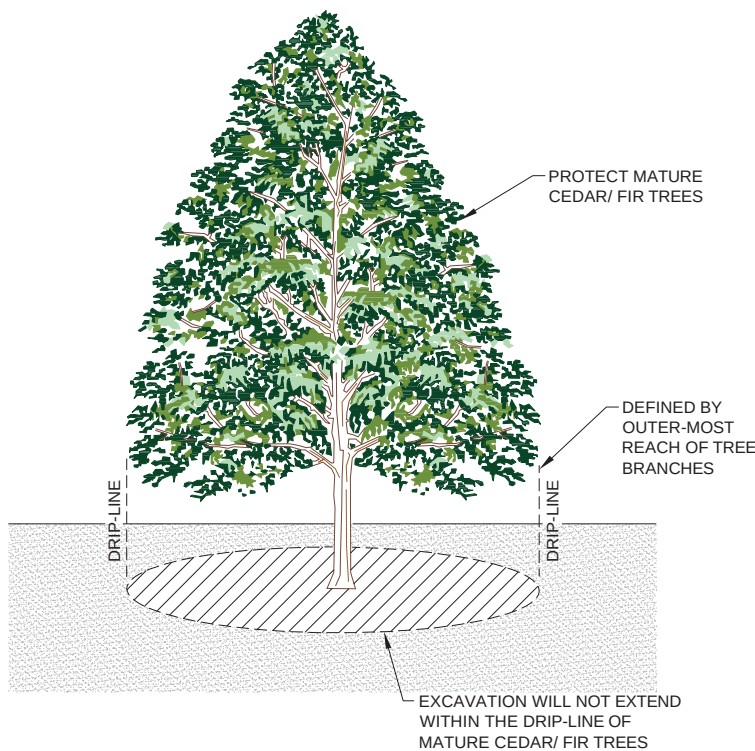


REMEDIAL EXCAVATION CROSS-SECTION

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=2'
VERTICAL EXAGGERATION: 10X

B

7



TYPICAL MATURE TREE PROTECTION DETAIL

NOT TO SCALE

1

7

ID	NORTHING	EASTING	LATTITUDE	LONGITUDE
CP- 1	540519.54	1253074.53	N48° 28' 14.75"	W-122° 25' 48.56"
CP- 2	540523.19	1253094.15	N48° 28' 14.79"	W-122° 25' 48.27"
CP- 3	540538.37	1253169.12	N48° 28' 14.96"	W-122° 25' 47.16"
CP- 4	540531.82	1253219.49	N48° 28' 14.90"	W-122° 25' 46.41"
CP- 5	540544.93	1253278.46	N48° 28' 15.04"	W-122° 25' 45.54"
CP- 6	540561.76	1253300.01	N48° 28' 15.21"	W-122° 25' 45.22"
CP- 7	540561.34	1253345.04	N48° 28' 15.22"	W-122° 25' 44.56"
CP- 8	540557.73	1253355.04	N48° 28' 15.18"	W-122° 25' 44.41"
CP- 9	540543.29	1253395.16	N48° 28' 15.05"	W-122° 25' 43.81"
CP-10	540523.22	1253405.81	N48° 28' 14.85"	W-122° 25' 43.64"
CP-11	540501.52	1253378.78	N48° 28' 14.63"	W-122° 25' 44.04"
CP-12	540451.55	1253368.08	N48° 28' 14.14"	W-122° 25' 44.18"
CP-13	540415.53	1253386.15	N48° 28' 13.79"	W-122° 25' 43.90"
CP-14	540434.36	1253425.06	N48° 28' 13.98"	W-122° 25' 43.33"
CP-15	540420.03	1253455.36	N48° 28' 13.85"	W-122° 25' 42.87"
CP-16	540409.79	1253490.98	N48° 28' 13.75"	W-122° 25' 42.34"
CP-17	540395.73	1253489.76	N48° 28' 13.61"	W-122° 25' 42.36"
CP-18	540369.83	1253487.63	N48° 28' 13.36"	W-122° 25' 42.38"
CP-19	540345.09	1253526.61	N48° 28' 13.12"	W-122° 25' 41.79"
CP-20	540338.54	1253556.09	N48° 28' 13.06"	W-122° 25' 41.36"
CP-21	540308.74	1253583.37	N48° 28' 12.77"	W-122° 25' 40.94"
CP-22	540282.56	1253607.35	N48° 28' 12.52"	W-122° 25' 40.58"
CP-23	540280.39	1253609.33	N48° 28' 12.50"	W-122° 25' 40.55"
CP-24	540240.26	1253635.94	N48° 28' 12.11"	W-122° 25' 40.14"
CP-25	540211.19	1253626.94	N48° 28' 11.82"	W-122° 25' 40.27"
CP-26	540204.23	1253645.36	N48° 28' 11.76"	W-122° 25' 39.99"
CP-27	540146.83	1253634.46	N48° 28' 11.19"	W-122° 25' 40.13"
CP-28	540122.33	1253629.80	N48° 28' 10.95"	W-122° 25' 40.20"
CP-29	540081.62	1253650.48	N48° 28' 10.55"	W-122° 25' 39.88"
CP-30	540069.91	1253656.42	N48° 28' 10.43"	W-122° 25' 39.78"
CP-31	540059.68	1253669.93	N48° 28' 10.34"	W-122° 25' 39.58"
CP-32	540074.01	1253714.57	N48° 28' 10.49"	W-122° 25' 38.92"
CP-33	540030.60	1253715.80	N48° 28' 10.06"	W-122° 25' 38.89"
CP-34	540012.09	1253665.84	N48° 28' 09.87"	W-122° 25' 39.63"
CP-35	540031.34	1253647.00	N48° 28' 10.05"	W-122° 25' 39.91"
CP-36	540033.39	1253642.09	N48° 28' 10.07"	W-122° 25' 39.99"
CP-37	540029.70	1253640.86	N48° 28' 10.03"	W-122° 25' 40.00"
CP-38	540023.56	1253642.50	N48° 28' 09.97"	W-122° 25' 39.98"
CP-39	540001.04	1253653.96	N48° 28' 09.75"	W-122° 25' 39.80"
CP-40	539980.25	1253619.66	N48° 28' 09.54"	W-122° 25' 40.30"
CP-41	539974.42	1253611.56	N48° 28' 09.48"	W-122° 25' 40.42"
CP-42	539953.95	1253619.97	N48° 28' 09.28"	W-122° 25' 40.29"
CP-43	539908.08	1253617.93	N48° 28' 08.83"	W-122° 25' 40.31"
CP-44	539841.74	1253649.87	N48° 28' 08.18"	W-122° 25' 39.81"
CP-45	539826.92	1253592.13	N48° 28' 08.02"	W-122° 25' 40.66"
CP-46	539817.91	1253567.97	N48° 28' 07.93"	W-122° 25' 41.02"
CP-47	539863.78	1253540.53	N48° 28' 08.38"	W-122° 25' 41.44"
CP-48	539887.12	1253540.53	N48° 28' 08.61"	W-122° 25' 41.45"
CP-49	539937.07	1253551.18	N48° 28' 09.10"	W-122° 25' 41.30"
CP-50	539958.66	1253553.10	N48° 28' 09.31"	W-122° 25' 41.28"
CP-51	539989.90	1253555.68	N48° 28' 09.62"	W-122° 25' 41.25"
CP-52	540043.13	1253552.00	N48° 28' 10.15"	W-122° 25' 41.33"
CP-53	540055.13	1253547.18	N48° 28' 10.27"	W-122° 25' 41.40"
CP-54	540092.60	1253532.34	N48° 28' 10.63"	W-122° 25' 41.63"
CP-55	540109.98	1253535.45	N48° 28' 10.80"	W-122° 25' 41.59"
CP-56	540129.13	1253538.86	N48° 28' 10.99"	W-122° 25' 41.55"

ID	NORTHING	EASTING	LATTITUDE	LONGITUDE
CP-57	540166.50	1253545.55	N48° 28' 11.36"	W-122° 25' 41.46"
CP-58	540177.37	1253547.49	N48° 28' 11.47"	W-122° 25' 41.43"
CP-59	540215.22	1253563.73	N48° 28' 11.85"	W-122° 25' 41.20"
CP-60	540235.51	1253572.47	N48° 28' 12.05"	W-122° 25' 41.08"
CP-61	540267.86	1253566.33	N48° 28' 12.37"	W-122° 25' 41.18"
CP-62	540285.88	1253536.44	N48° 28' 12.54"	W-122° 25' 41.63"
CP-63	540291.20	1253525.79	N48° 28' 12.59"	W-122° 25' 41.79"
CP-64	540306.36	1253522.51	N48° 28' 12.74"	W-122° 25' 41.84"
CP-65	540309.79	1253519.91	N48° 28' 12.77"	W-122° 25' 41.88"
CP-66	540348.94	1253491.39	N48° 28' 13.15"	W-122° 25' 42.32"
CP-67	540362.87	1253454.54	N48° 28' 13.28"	W-122° 25' 42.87"
CP-68	540369.03	1253440.51	N48° 28' 13.34"	W-122° 25' 43.08"
CP-69	540386.62	1253407.45	N48° 28' 13.51"	W-122° 25' 43.58"
CP-70	540343.21	1253414.82	N48° 28' 13.08"	W-122° 25' 43.45"
CP-71	540318.64	1253447.99	N48° 28' 12.84"	W-122° 25' 42.95"
CP-72	540299.80	1253429.15	N48° 28' 12.66"	W-122° 25' 43.23"
CP-73	540324.78	1253403.76	N48° 28' 12.90"	W-122° 25' 43.61"
CP-74	540332.56	1253349.30	N48° 28' 12.96"	W-122° 25' 44.42"
CP-75	540303.90	1253331.69	N48° 28' 12.68"	W-122° 25' 44.67"
CP-76	540354.68	1253311.63	N48° 28' 13.17"	W-122° 25' 44.99"
CP-77	540352.22	1253285.42	N48° 28' 13.14"	W-122° 25' 45.38"
CP-78	540328.88	1253266.50	N48° 28' 12.91"	W-122° 25' 45.65"
CP-79	540326.83	1253245.21	N48° 28' 12.88"	W-122° 25' 45.96"
CP-80	540335.02	1253196.07	N48° 28' 12.95"	W-122° 25' 46.70"
CP-81	540344.82	1253194.64	N48° 28' 13.05"	W-122° 25' 46.72"
CP-82	540396.85	1253187.06	N48° 28' 13.56"	W-122° 25' 46.85"
CP-83	540392.76	1253170.68	N48° 28' 13.52"	W-122° 25' 47.09"
CP-84	540418.97	1253150.20	N48° 28' 13.77"	W-122° 25' 47.40"
CP-85	540468.52	1253173.13	N48° 28' 14.27"	W-122° 25' 47.08"
CP-86	540434.51	1253207.90	N48° 28' 13.94"	W-122° 25' 46.55"
CP-87	540413.64	1253229.24	N48° 28' 13.74"	W-122° 25' 46.23"
CP-88	540436.57	1253274.69	N48° 28' 13.97"	W-122° 25' 45.56"
CP-89	540424.70	1253335.29	N48° 28' 13.87"	W-122° 25' 44.66"
CP-90	540443.95	1253338.98	N48° 28' 14.06"	W-122° 25' 44.61"
CP-91	540488.58	1253341.85	N48° 28' 14.50"	W-122° 25' 44.58"
CP-92	540459.10	1253316.46	N48° 28' 14.20"	W-122° 25' 44.95"
CP-93	540479.16	1253291.48	N48° 28' 14.40"	W-122° 25' 45.32"
CP-94	540477.11	1253278.37	N48° 28' 14.37"	W-122° 25' 45.52"
CP-95	540496.36	1253228.83	N48° 28' 14.55"	W-122° 25' 46.26"
CP-96	540466.47	1253157.57	N48° 28' 14.24"	W-122° 25' 47.31"
CP-97	540473.84	1253146.11	N48° 28' 14.31"	W-122° 25' 47.48"
CP-98	540478.87	1253122.42	N48° 28' 14.36"	W-122° 25' 47.83"
CP-99	540486.53	1253086.32	N48° 28' 14.43"	W-122° 25' 48.37"
CP-100	540501.16	1253129.74	N48° 28' 14.58"	W-122° 25' 47.73"
CP-101	540500.62	1253215.26	N48° 28' 14.59"	W-122° 25' 46.46"
CP-102	540515.74	1253216.92	N48° 28' 14.74"	W-122° 25' 46.44"
CP-103	540365.72	1253223.42	N48° 28' 13.26"	W-122° 25' 46.30"
CP-104	540338.84	1253525.42	N48° 28' 13.06"	W-122° 25' 41.81"
CP-105	540315.67	1253521.03	N48° 28' 12.83"	W-122° 25' 41.87"
CP-106	540274.03	1253583.49	N48° 28' 12.43"	W-122° 25' 40.93"
CP-107	540224.34	1253590.77	N48° 28' 11.94"	W-122° 25' 40.81"
CP-108	540206.87	1253598.34	N48° 28' 11.77"	W-122° 25' 40.69"
CP-109	540185.03	1253611.51	N48° 28' 11.56"	W-122° 25' 40.49"
CP-110	540028.30	1253581.64	N48° 28' 10.01"	W-122° 25' 40.88"
CP-111	540019.91	1253616.52	N48° 28' 09.93"	W-122° 25' 40.36"
CP-112	539985.27	1253589.57	N48° 28' 09.58"	W-122° 25' 40.75"
CP-112	539871.53	1253582.29	N48° 28' 08.46"	W-122° 25' 40.82"

EXCAVATION CONTROL POINT COORDINATES



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Seattle WA 98101

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F: 206-728-2731



NO.	DATE	BY	REVISION

TAXIWAY F CLEANUP ACTION PROJECT

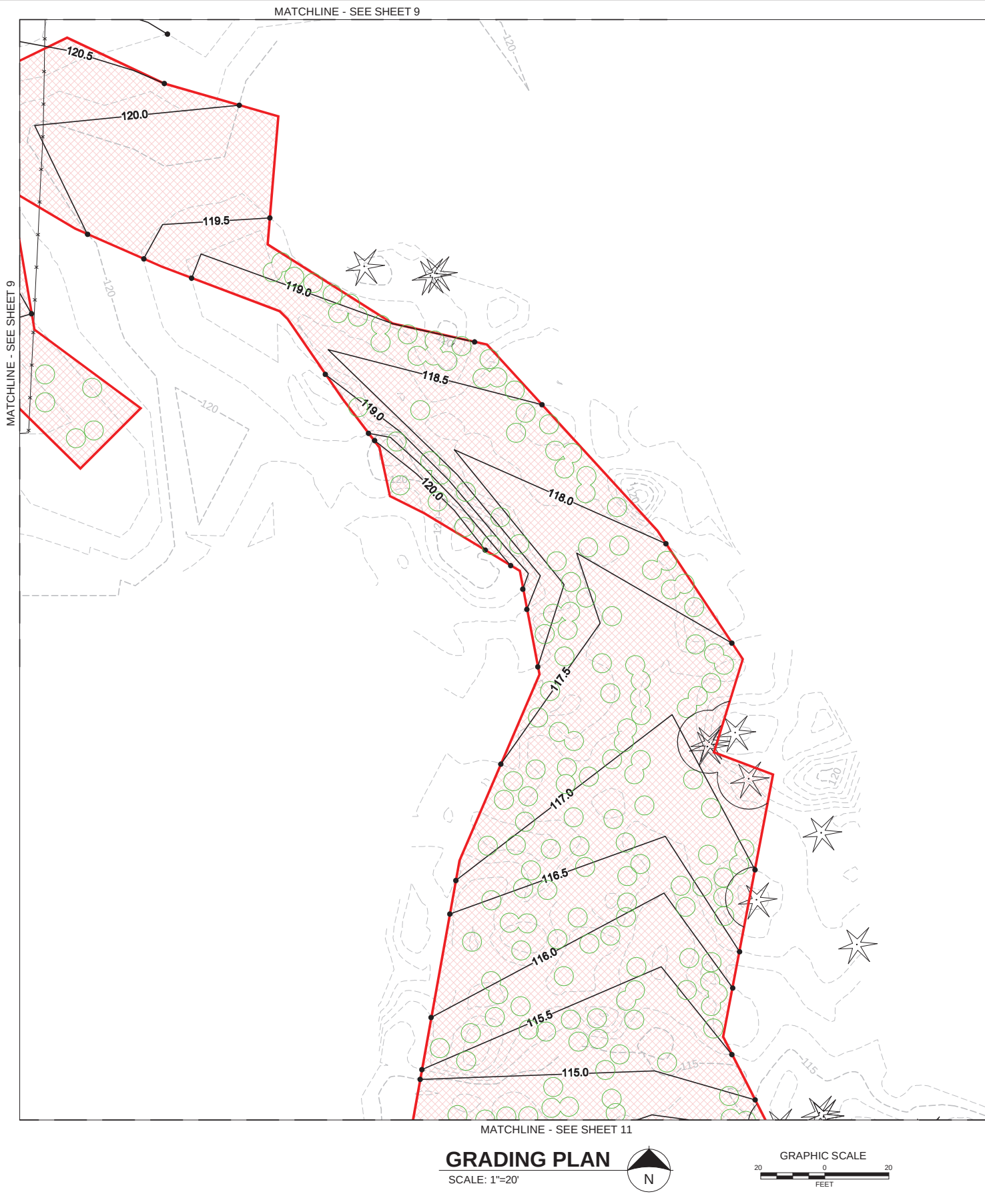
Port of Skagit County

REMEDIAL EXCAVATION DETAILS

DRAWN: TJM	PROJECT NO.536401303
DESIGN: AJ	SCALE:
CHECKED:	DATE: 7/13/2011
SHEET NO.	8

CONTRACT DRAWINGS

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LEGEND

- LIMITS OF EXCAVATION AND BACKFILL
- EXISTING TOPOGRAPHIC CONTOUR (ELEVATION IN FEET, 0.5' INTERVALS)
- GRADE CONTOUR (ELEVATION IN FEET, 0.5' INTERVALS)
- EXISTING FENCE LINE
- TOPSOIL PLANTING MOUND-TOPSOIL PLANTING MOUND TO BE CREATED ON TOP OF THE FINISHED GRADE, REFER TO SHEET 18 FOR DETAILS.
- APPROXIMATE MATURE CONIFER TREE DRIP LINE
NO EXCAVATION OR REVEGETATION IN THESE AREAS

GEOENGINEERS

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PRECISION APPROACH

ENGINEERING

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Bellingham, WA 98225
360-733-1567

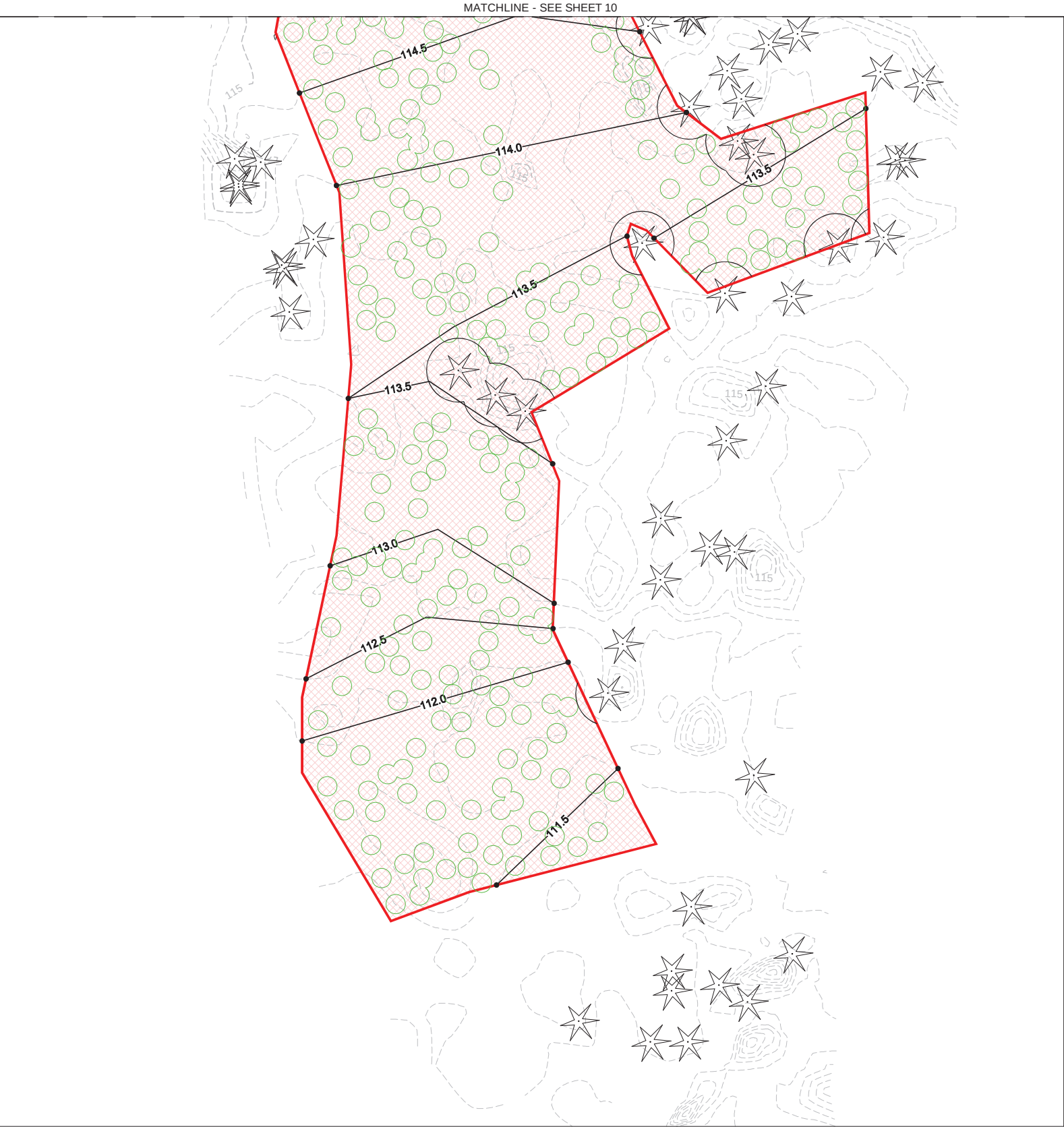


NO.	DATE	BY	REVISION

TAXIWAY F CLEANUP ACTION PROJECT
Port of Skagit County
GRADING PLAN

DRAWN: TJM	PROJECT NO. 536401303
DESIGN: AJ	SCALE: 1"=20'
CHECKED:	DATE: 7/13/2011
SHEET NO.	10

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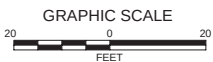


LEGEND

- LIMITS OF EXCAVATION AND BACKFILL
- EXISTING TOPOGRAPHIC CONTOUR (ELEVATION IN FEET, 0.5' INTERVALS)
- GRADE CONTOUR (ELEVATION IN FEET, 0.5' INTERVALS)
- TOPSOIL PLANTING MOUND-TOPSOIL PLANTING MOUND TO BE CREATED ON TOP OF THE FINISHED GRADE, REFER TO SHEET 18 FOR DETAILS.
- APPROXIMATE MATURE CONIFER TREE DRIP LINE
NO EXCAVATION OR REVEGETATION IN THESE AREAS

GRADING PLAN

SCALE: 1"=20'



GEOENGINEERS

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PRECISION APPROACH
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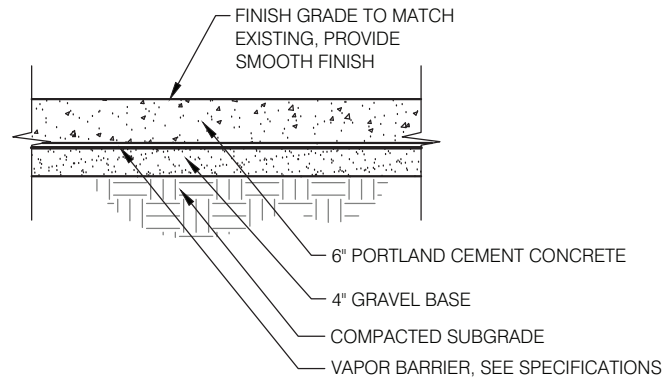
NO.	DATE	BY	REVISION

TAXIWAY F CLEANUP ACTION PROJECT
Port of Skagit County
GRADING PLAN

DRAWN: TJM	PROJECT NO. 536401303
DESIGN: AJ	SCALE: 1"=20'
CHECKED:	DATE: 7/13/2011
SHEET NO.	11

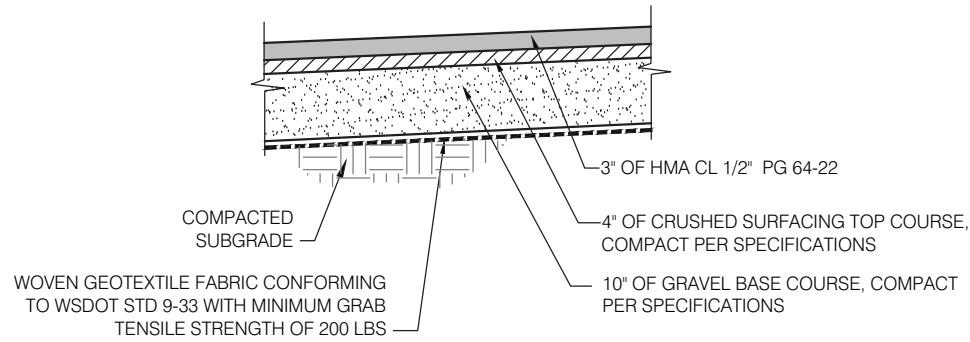
CONTRACT DRAWINGS

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PCC BUILDING SLAB DETAIL
NTS

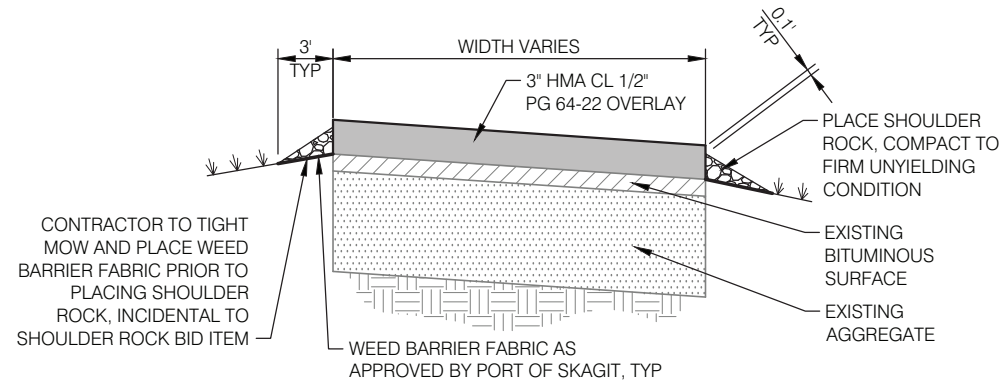
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9



- NOTES:
- AREAS OF PAVEMENT REPAIR SHALL BE AS DIRECTED BY PORT OF SKAGIT. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. IT IS ANTICIPATED THAT PAVEMENT REPAIR WORK WILL BE REQUIRED ON TAXIWAY F AND ON THE BAYVIEW ROAD OVERLAY AREA BEFORE AND AFTER THE OVERLAY.
 - PROVIDE A 0.1' DROP BETWEEN PAVED AND NON-PAVED SURFACES.

TAXIWAY PAVEMENT SECTION
AND PAVEMENT REPAIR DETAIL
NTS

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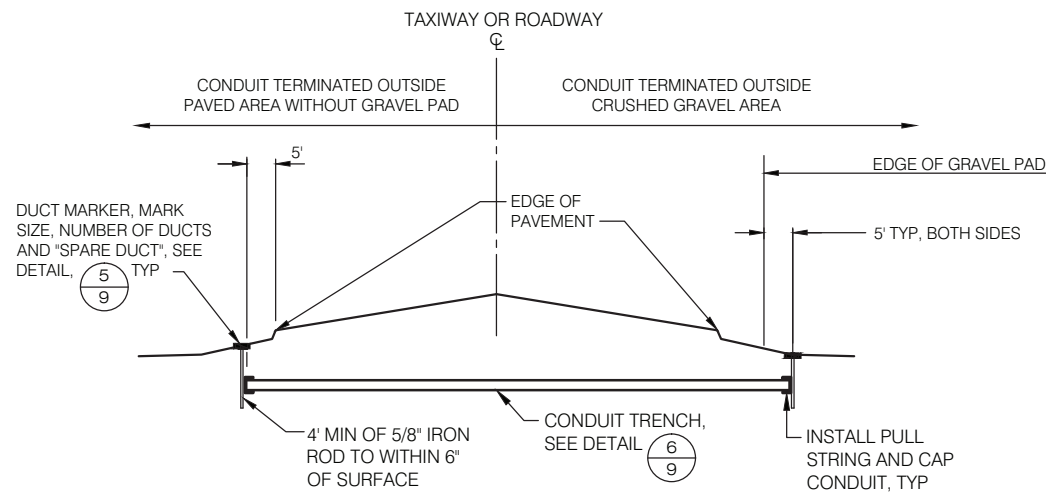
- NOTES:
- FULL DEPTH PAVEMENT SECTION TO BE CONSTRUCTED ON BAYVIEW ROAD AT INTERSECTION WITH TAXIWAY F AND FARM TO MARKET ROAD TO PROVIDE TRANSITION BETWEEN PAVEMENT OVERLAY AND EXISTING PAVEMENT TO REMAIN. PORT OF SKAGIT TO PROVIDE LIMITS OF FULL DEPTH PAVEMENT PRIOR TO BEGINNING WORK ON BAYVIEW ROAD. SEE PAVEMENT REPAIR DETAIL

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 FOR PAVEMENT SECTION.

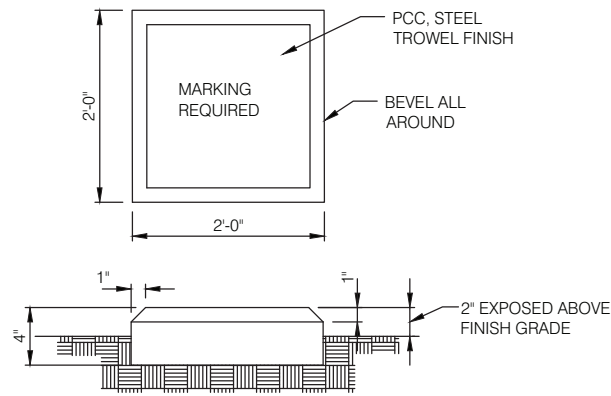
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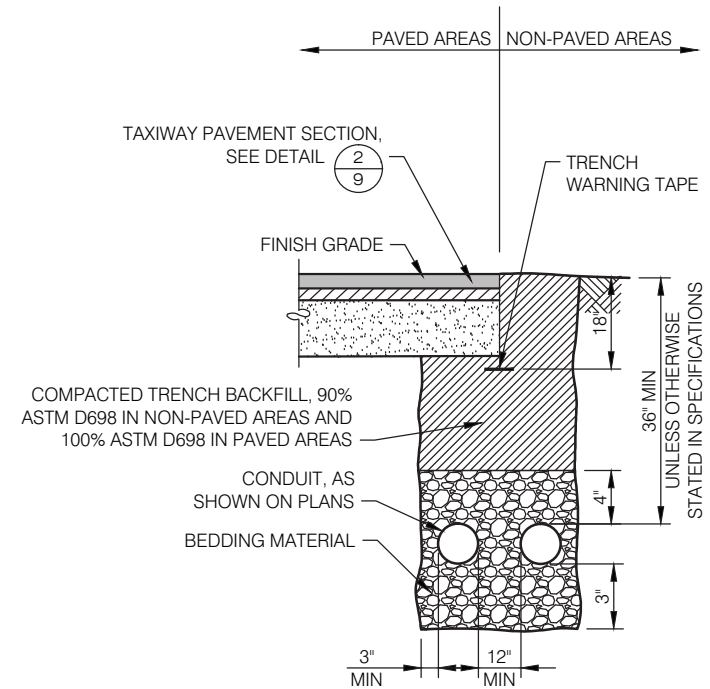
SPARE CONDUIT DETAIL
NTS

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TYPICAL DUCT AND
CABLE CONCRETE MARKER
NTS

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9



CONDUIT TRENCH DETAIL
NTS

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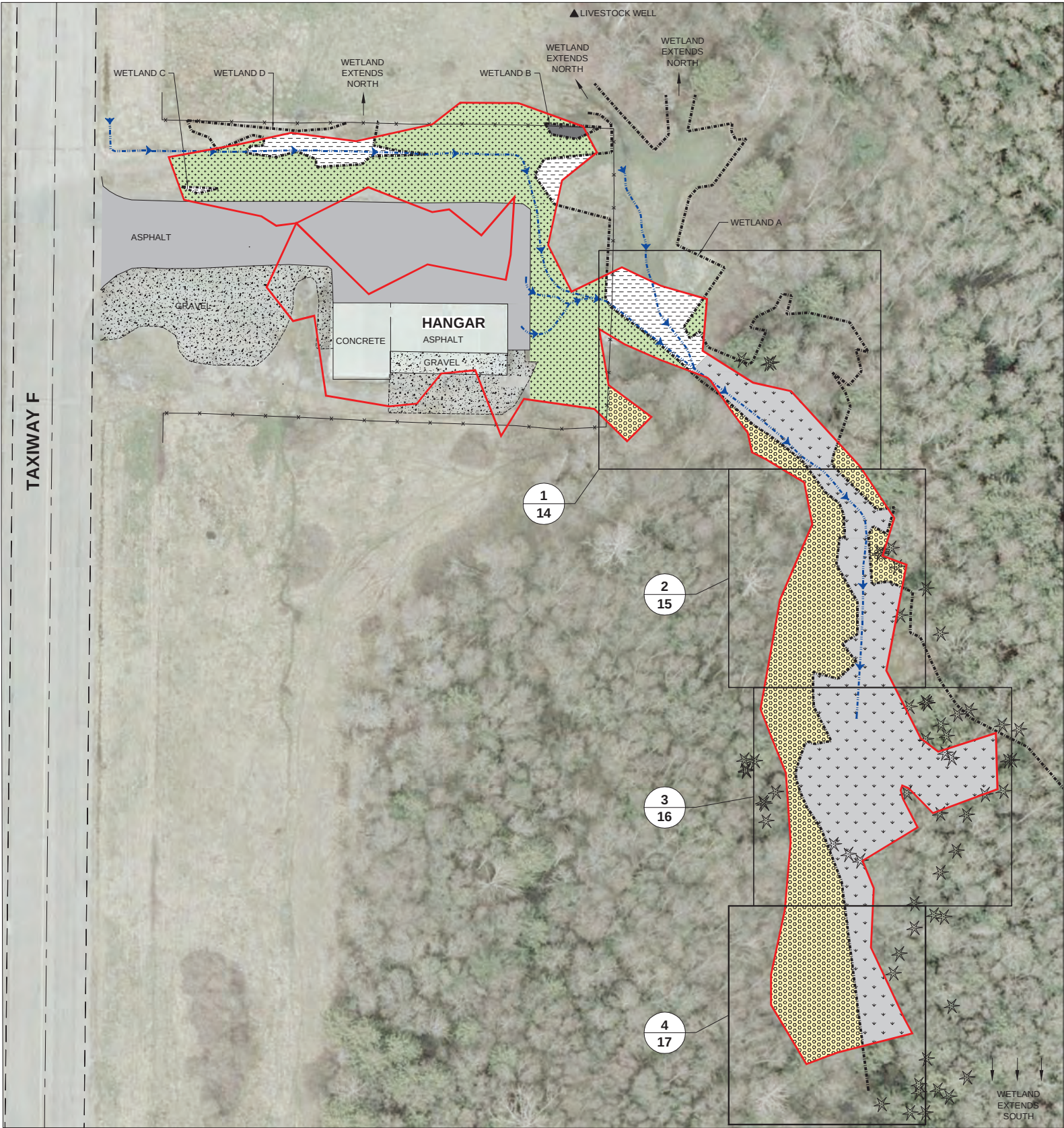


TAXIWAY F CLEANUP ACTION PROJECT
PORT OF SKAGIT COUNTY
PAVING AND GRADING DETAILS

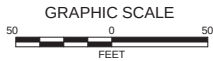
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CHECKED: RLN	DATE: JUNE 2011
SHEET NO.	12

CONTRACT DRAWINGS

P:\1515364\013\CAD\13 RESTORATION PLAN.DWG\TAB: LAYOUT3-LAYOUT1 MODIFIED BY TMICHAUD ON JUL 14, 2011 - 10:56



RE-VEGETATION AND WETLAND RESTORATION PLAN



GENERAL LEGEND

- LIMITS OF EXCAVATION
- APPROXIMATE LIMITS OF WETLAND AREAS (BASED ON HART CROWSER 2007 SURVEY)
- MATURE CEDAR/ FIR TREE TO BE PROTECTED
- FENCE LINE
- DRAINAGE CHANNEL (APPROXIMATE RAINWATER RUNOFF FLOW DIRECTION)

RESTORATION LEGEND

- FORESTED WETLAND (25,519 sq ft; SEE TABLE 1, SHEET 18)
- EMERGENT WETLAND (5,716 sq ft; SEE TABLE 2, SHEET 18)
- SCRUB-SHRUB WETLAND (229 sq ft; SEE TABLE 1 AND 2, SHEET 18)
- FORESTED BUFFER (21,888 sq ft; SEE TABLE 3, SHEET 18)
- GRASS / HERB UPLAND (BUFFER AND NON-BUFFER) (24,454 sq ft; SEE TABLE 4, SHEET 18)

RESTORATION NOTES

- LIMITS OF EXCAVATION MARK THE APPROXIMATE RESTORATION BOUNDARIES. IF ADDITIONAL GRADING, EXCAVATION, OR CLEARING OF VEGETATION IS REQUIRED, THE RESTORATION BOUNDARIES WILL EXTEND TO THE LIMITS OF THE ADDITIONAL WORK AREA. THESE ADDITIONAL DISTURBED AREAS SHALL BE RE-VEGETATED IN ACCORDANCE WITH THE PERMIT WETLAND RESTORATION PLAN. AS SHOWN IN THE LEGEND, EXAMPLES OF VEGETATIVE COMMUNITIES AND ASSOCIATED RESTORATION/RE-VEGETATION AREAS ON SITE ARE FORESTED WETLAND, SCRUB-SHRUB WETLAND, EMERGENT WETLAND, FORESTED BUFFER, AND GRASS/HERB UPLAND (BUFFER AND NON-BUFFER). IF RESTORATION BOUNDARIES ARE EXTENDED AS A RESULTANT OF ADDITIONAL GRADING AND/OR EXCAVATION, THE CONTRACTOR SHALL PREPARE A MAP WITH PROPOSED UPDATED RESTORATION AREAS AND SUBMIT TO PORT OF SKAGIT FOR APPROVAL.
- CLEAN TOPSOIL MATERIAL WILL BE USED TO BACKFILL AREAS EXCAVATED WITHIN THE EXISTING VEGETATED/FORESTED/BARE GROUND UPLANDS AND WETLANDS AREA OR AS DIRECTED BY PORT OF SKAGIT. REFER TO SPECIFICATIONS FOR TOPSOIL MIX DETAILS.
- THE SITE CONTAINS FOUR WETLANDS REFERRED TO AS WETLANDS A, B, C, AND D. WETLAND A HAS A 75-FOOT BUFFER AND WETLAND C HAS A 25-FOOT BUFFER (SKAGIT COUNTY CODE (SCC) 14.24.230). WETLANDS B AND D ARE EXEMPT FROM SCC 14.24 AND THUS DO NOT HAVE REGULATED BUFFERS BASED ON THE FACT THAT THEY ARE CATEGORY IV WETLANDS LESS THAN 1,000 SQ FT AND THEY ARE ISOLATED, NOT ASSOCIATED WITH A RIPARIAN CORRIDOR, NOT PART OF A WETLAND MOSAIC, AND DO NOT CONTAIN PRIORITY SPECIES OR HABITATS (SCC 14.24.230(6)(A)). PLANTING LOCATIONS ARE SHOWN ON SHEET 14 THROUGH 17.
- FOR EACH RESTORATION/RE-VEGETATION AREA, THE LEGEND INDICATES THE SQUARE FOOTAGE OF THAT AREA (BASED ON CURRENT ESTIMATED LIMITS OF EXCAVATION) AND REFERS TO SPECIFIC PLANTING TABLE(S) THAT CONTAIN INFORMATION ON PLANT SPECIES, CONTAINER SIZE, ESTIMATED QUANTITIES, AND PERCENT SEED COMPOSITION BY WEIGHT (SHEET 18). PLANT QUANTITIES ESTIMATES ARE BASED ON 10-FOOT-ON-CENTER SPACING FOR TREES AND 5-FOOT-ON-CENTER SPACING FOR SHRUBS. SEED MIXTURES SHALL BE APPLIED AT A MINIMUM RATE OF 30 POUNDS PER ACRE USING HYDROSEEDING, BLOWER EQUIPMENT, POWER-DRAWN DRILLING EQUIPMENT OR SEEDERS, OR MANUAL SEEDING METHODS.
- PLANTING SHALL OCCUR BETWEEN OCT 15, 2011 AND MARCH 15, 2012. NO PLANTING IS TO BE DONE IN TEMPERATURES BELOW 40°F AND ABOVE 85°F. ALL PLANTING ACTIVITIES AT THE SITE SHALL BE COMPLETED PRIOR TO MARCH 15, 2012 UNLESS OTHERWISE ALLOWED BY THE OWNER.
- SEEDING SHALL OCCUR BEFORE OCTOBER 1, 2011 OR AFTER APRIL 1, 2012 AND SHALL BE COMPLETED PRIOR TO MAY 1, 2012 UNLESS OTHERWISE ALLOWED BY PORT OF SKAGIT.
- PLANT LAYOUT SHALL BE COMPLETED BY LAYING CONTAINERIZED PLANTS AS SHOWN ON SHEET 14 THROUGH 17. PLANT LAYOUT SHALL BE INSPECTED AND APPROVED BY PORT OF SKAGIT BEFORE PLANTS ARE INSTALLED. PLANT INSTALLATION SHALL BE COMPLETED AS PER THE PLANTING DETAILS SHOWN ON SHEET 18.
- ALL INSTALLED PLANTS SHALL BE TIED WITH COLOR-CODED FLAGGING TAPE TO ASSIST IN IDENTIFICATION OF INSTALLED PLANTS DURING MONITORING EVENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF THE PLANTING PLAN, PROTECTION OF THE REQUIRED RESTORATION AREA, MAINTAINING APPROPRIATE PROTECTIVE BARRIERS, AND FIELD STAKING THE CONSTRUCTION AREAS. THE CONTRACTOR SHALL BE QUALIFIED AS KNOWLEDGEABLE ABOUT LANDSCAPE AND PLANT INSTALLATION. PORT OF SKAGIT SHALL OVERSEE THE WORK AND UTILIZE A QUALIFIED BIOLOGIST TO OVERSEE RESTORATION ACTIVITIES, AS NEEDED.
- CONTRACTOR SHALL PROVIDE A ONE-YEAR WARRANTY FOR ALL PLANTS PROVIDED.

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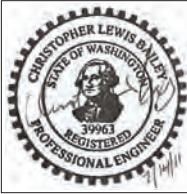
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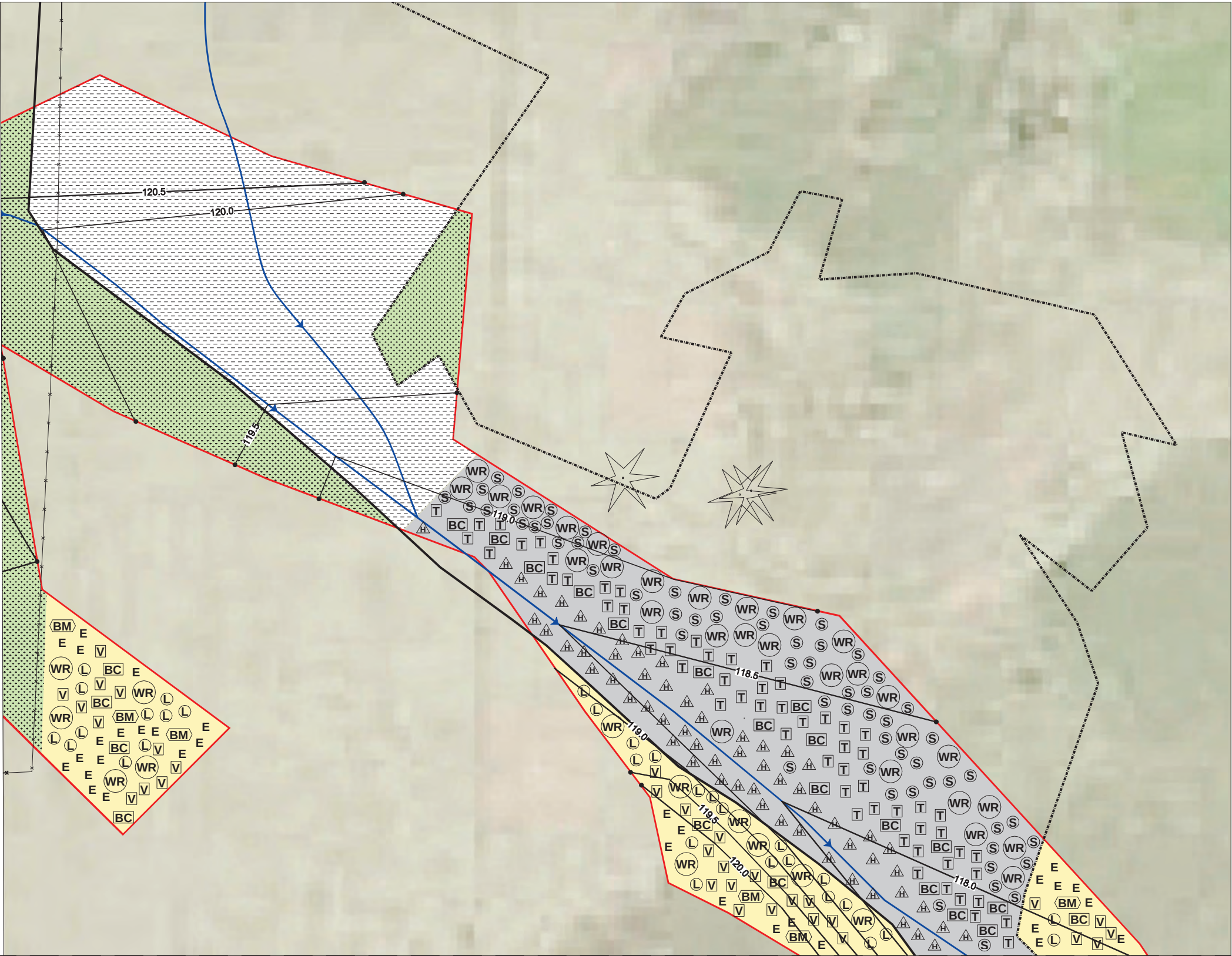
Port of Skagit County

RE-VEGETATION AND WETLAND RESTORATION PLAN

DRAWN: TJM	PROJECT NO. 536401303
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CHECKED:	DATE: 7/13/2011
SHEET NO.	13

CONTRACT DRAWINGS

P:\15\5364\013\03\CAD\SHEET\SH_14-17 RESTORATION DETAIL VIEWS.DWG\TAB\14 MODIFIED BY THICHAUD ON JUL 14, 2011 - 10:58



GENERAL LEGEND

- LIMITS OF EXCAVATION
- APPROXIMATE LIMITS OF WETLAND AREAS (BASED ON HART CROWSER 2007 SURVEY)
- FENCE LINE
- MATURE CEDAR/ FIR TREE TO BE PROTECTED
- DRAINAGE CHANNEL (APPROXIMATE RAINWATER RUNOFF FLOW DIRECTION)
- GRADE CONTOUR (ELEVATION IN FEET, 0.5')

RESTORATION LEGEND

- FORESTED WETLAND (25,519 sq ft; SEE TABLE 1, SHEET 18)
- EMERGENT WETLAND (5,716 sq ft; SEE TABLE 2, SHEET 18)
- FORESTED BUFFER (21,888 sq ft; SEE TABLE 3, SHEET 18)
- GRASS / HERB UPLAND (BUFFER AND NON-BUFFER) (24,454 sq ft; SEE TABLE 4, SHEET 18)

FORESTED WETLAND PLANT QUANTITIES *		
SYMBOL	PLANT SPECIES	QUANTITY
WR	WESTERN RED CEDAR	29
BC	BLACK COTTONWOOD	17
T	TWINBERRY	61
S	SALMONBERRY	61
A	HARDHACK SPIREA	61

* QUANTITIES FOR SHEET 14

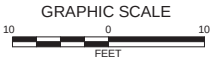
FORESTED BUFFER PLANT QUANTITIES *		
SYMBOL	PLANT SPECIES	QUANTITY
WR	WESTERN RED CEDAR	11
BM	BIG LEAF MAPLE	6
BC	BLACK COTTONWOOD	6
V	VINE LEAF MAPLE	31
L	LADY FERN	31
E	RED ELDERBERRY	31

* QUANTITIES FOR SHEET 14



PLANTING PLAN

1
13



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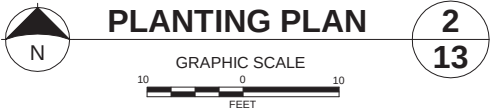
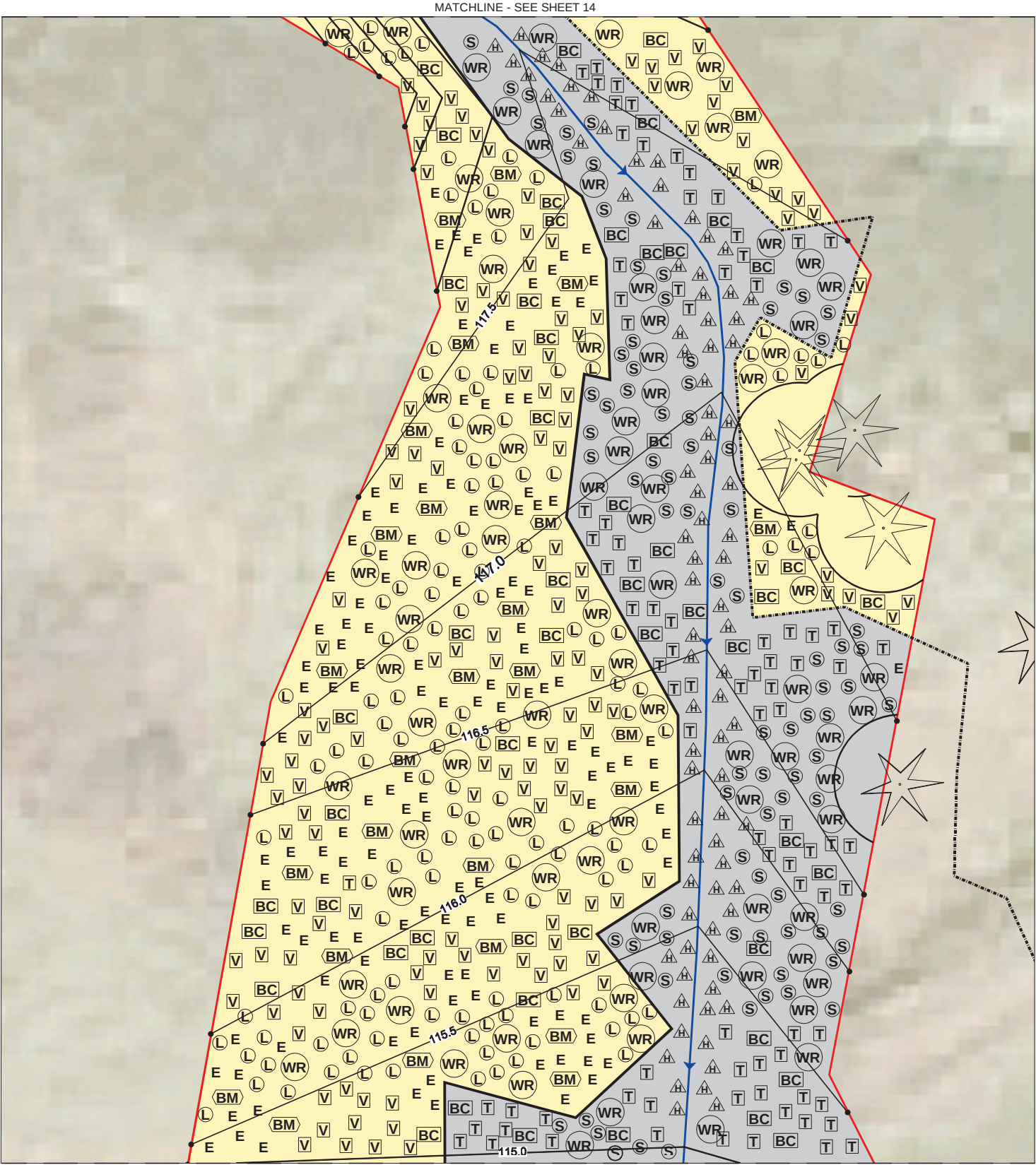
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TAXIWAY F CLEANUP ACTION PROJECT
Port of Skagit County
WETLAND RESTORATION PLANTING PLAN

DRAWN: TJM	PROJECT NO. 536401303
DESIGN: AJ	SCALE: 1"=10'
CHECKED:	DATE: 7/13/2011
SHEET NO.	14

CONTRACT DRAWINGS

P:\15\5364013\03\CAD\SHEET\SH_14-17 RESTORATION DETAIL VIEWS.DWG\TAB15 MODIFIED BY THICHAUD ON JUL 14, 2011 - 10:59



GENERAL LEGEND

- LIMITS OF EXCAVATION
- APPROXIMATE LIMITS OF WETLAND AREAS (BASED ON HART CROWSER 2007 SURVEY)
- MATURE CEDAR/ FIR TREE TO BE PROTECTED
- DRAINAGE CHANNEL (APPROXIMATE RAINWATER RUNOFF FLOW DIRECTION)
- GRADE CONTOUR (ELEVATION IN FEET, 0.5')

RESTORATION LEGEND

- FORESTED WETLAND (25,519 sq ft; SEE TABLE 1, SHEET 18)
- FORESTED BUFFER (21,888 sq ft; SEE TABLE 3, SHEET 18)
- APPROXIMATE MATURE CONIFER TREE DRIP LINE NO EXCAVATION OR REVEGETATION IN THESE AREAS

FORESTED WETLAND PLANT QUANTITIES *		
SYMBOL	PLANT SPECIES	QUANTITY
	WESTERN RED CEDAR	40
	BLACK COTTONWOOD	24
	TWINBERRY	85
	SALMONBERRY	85
	HARDHACK SPIREA	85

* QUANTITIES FOR SHEET 15

FORESTED BUFFER PLANT QUANTITIES *		
SYMBOL	PLANT SPECIES	QUANTITY
	WESTERN RED CEDAR	46
	BIG LEAF MAPLE	27
	BLACK COTTONWOOD	28
	VINE LEAF MAPLE	135
	LADY FERN	135
	RED ELDERBERRY	135

* QUANTITIES FOR SHEET 15

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Port of Skagit County

WETLAND RESTORATION PLANTING PLAN

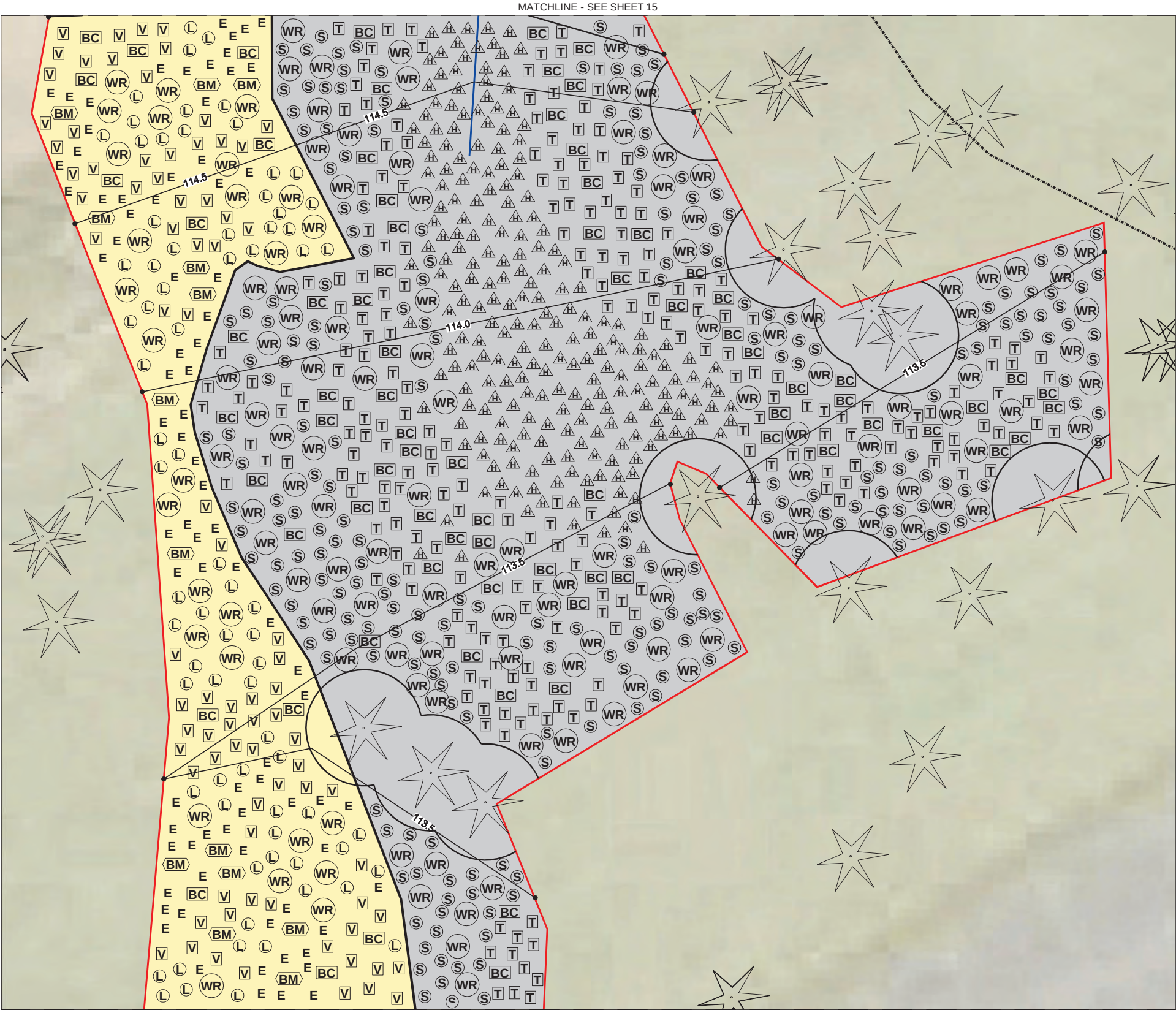
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PROJECT NO.536401303
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DATE: 7/13/2011

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CONTRACT DRAWINGS

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GENERAL LEGEND

- LIMITS OF EXCAVATION
- APPROXIMATE LIMITS OF WETLAND AREAS (BASED ON HART CROWSER 2007 SURVEY)
- MATURE CEDAR/ FIR TREE TO BE PROTECTED
- DRAINAGE CHANNEL (APPROXIMATE RAINWATER RUNOFF FLOW DIRECTION)
- GRADE CONTOUR (ELEVATION IN FEET, 0.5')

RESTORATION LEGEND

- FORESTED WETLAND (25,519 sq ft; SEE TABLE 1, SHEET 18)
- FORESTED BUFFER (21,888 sq ft; SEE TABLE 3, SHEET 18)
- APPROXIMATE MATURE CONIFER TREE DRIP LINE NO EXCAVATION OR REVEGETATION IN THESE AREAS

FORESTED WETLAND PLANT QUANTITIES *		
SYMBOL	PLANT SPECIES	QUANTITY
WR	WESTERN RED CEDAR	110
BC	BLACK COTTONWOOD	67
T	TWINBERRY	233
S	SALMONBERRY	233
A	HARDHACK SPIREA	233

* QUANTITIES FOR SHEET 16

FORESTED BUFFER PLANT QUANTITIES *		
SYMBOL	PLANT SPECIES	QUANTITY
WR	WESTERN RED CEDAR	27
BM	BIG LEAF MAPLE	14
BC	BLACK COTTONWOOD	14
V	VINE LEAF MAPLE	82
L	LADY FERN	82
E	RED ELDERBERRY	82

* QUANTITIES FOR SHEET 16

MATCHLINE - SEE SHEET 17

PLANTING PLAN

3
13

GRAPHIC SCALE

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FEET

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Port of Skagit County

WETLAND RESTORATION PLANTING PLAN

DRAWN: TJM

DESIGN: AJ

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SHEET NO.

PROJECT NO.536401303

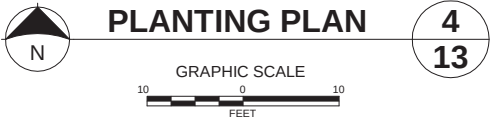
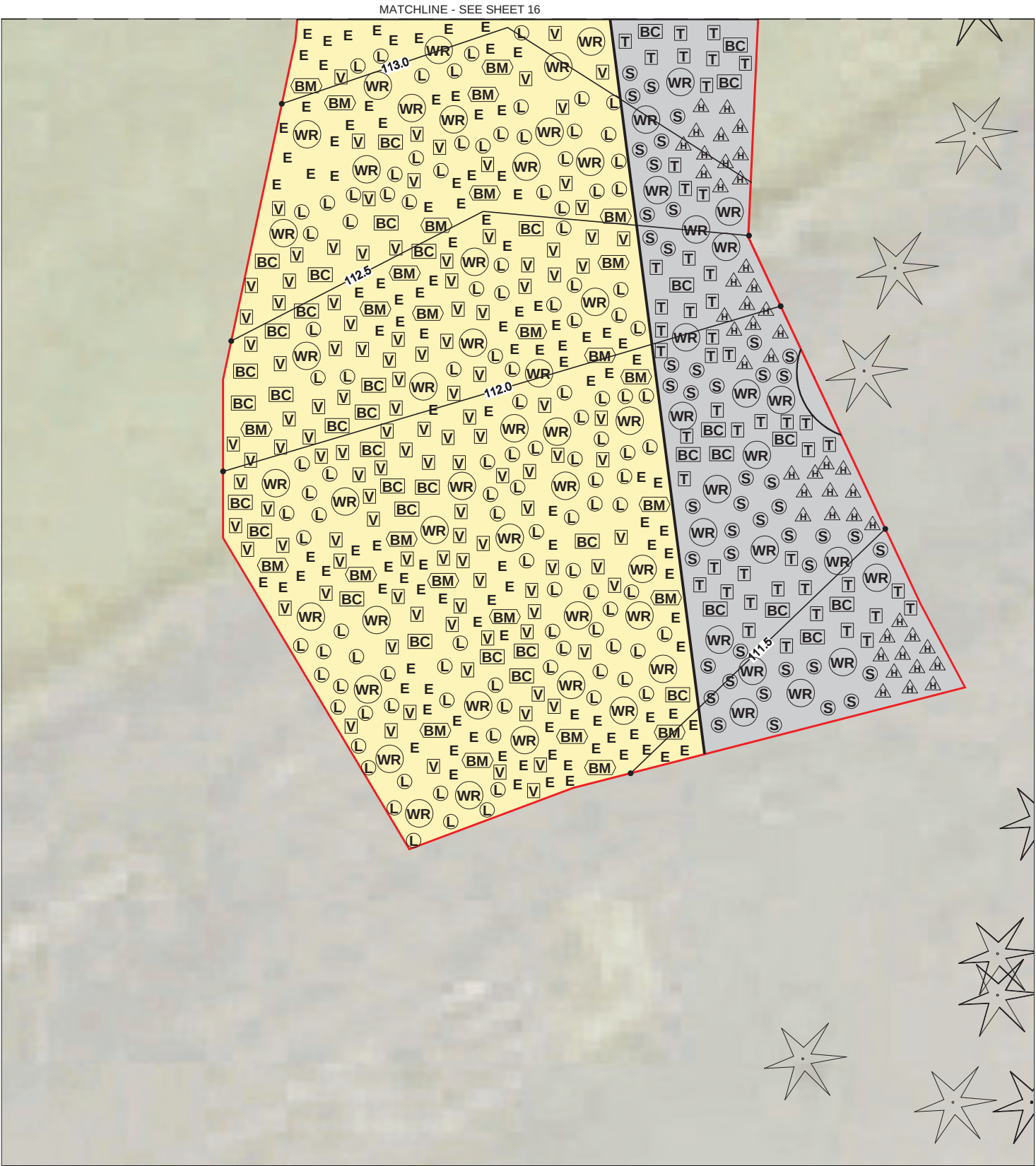
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16

CONTRACT DRAWINGS

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GENERAL LEGEND

- LIMITS OF EXCAVATION
- APPROXIMATE LIMITS OF WETLAND AREAS
(BASED ON HART CROWSER 2007 SURVEY)
- MATURE CEDAR/ FIR TREE TO BE PROTECTED
- DRAINAGE CHANNEL
(APPROXIMATE RAINWATER RUNOFF FLOW DIRECTION)
- GRADE CONTOUR (ELEVATION IN FEET, 0.5')

RESTORATION LEGEND

- FORESTED WETLAND (25,519 sq ft; SEE TABLE 1, SHEET 18)
- FORESTED BUFFER (21,888 sq ft; SEE TABLE 3, SHEET 18)
- APPROXIMATE MATURE CONIFER TREE DRIP LINE
NO EXCAVATION OR REVEGETATION IN THESE AREAS

FORESTED WETLAND PLANT QUANTITIES *		
SYMBOL	PLANT SPECIES	QUANTITY
WR	WESTERN RED CEDAR	21
BC	BLACK COTTONWOOD	12
T	TWINBERRY	46
S	SALMONBERRY	46
A	HARDHACK SPIREA	46

* QUANTITIES FOR SHEET 17

FORESTED BUFFER PLANT QUANTITIES *		
SYMBOL	PLANT SPECIES	QUANTITY
WR	WESTERN RED CEDAR	41
BM	BIG LEAF MAPLE	27
BC	BLACK COTTONWOOD	27
V	VINE LEAF MAPLE	117
L	LADY FERN	117
E	RED ELDERBERRY	117

* QUANTITIES FOR SHEET 17

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Port of Skagit County

WETLAND RESTORATION PLANTING PLAN

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SHEET NO.	17

CONTRACT DRAWINGS

P:\15\15364\013\03\CAD\SH_EET\SH_18 RESTORATION DETAILS.DWG\TAB.SH_18 MODIFIED BY TMICHAUD ON JUL 14, 2011 - 11:07

TABLE 1. PLANT SPECIES AND QUANTITIES ESTIMATES FOR FORESTED AND SCRUB-SHRUB WETLAND RESTORATION AREAS

Wetland	Restoration Area	Vegetation Strata	Species Common Name	Planting Detail Code	Species Scientific Name	Plant Stock Container Size (gallon)	Quantity
A	Forested	Tree	Black cottonwood	BC	<i>Populus balsamifera</i>	1	120
			Western redcedar	WR	<i>Thuja plicata</i>	1	200
		Shrub	Twinberry	T	<i>Lonicera involucrata</i>	1	425
			Salmonberry	S	<i>Rubus spectabilis</i>	1	425
			Hardhack	H	<i>Spiraea douglasii</i>	1	425
B	Scrub-shrub	Shrub	Hardhack	H	<i>Spiraea douglasii</i>	1	12

TABLE 2. EMERGENT WETLAND SEED MIX

Species Common Name	Species Scientific Name	Percent by Weight (applied at a minimum rate of 30 pounds per acre)
Slender rush	<i>Juncus tenuis</i>	15
Colonial bentgrass	<i>Agrostis tenuis</i>	30
Velvet grass	<i>Holcus lanatus</i>	30
Kentucky bluegrass	<i>Poa pratensis</i>	25

TABLE 3. PLANT SPECIES AND QUANTITIES ESTIMATES FOR FORESTED BUFFER RESTORATION AREAS

Wetland Buffer	Restoration Area	Vegetation Strata	Species Common Name	Planting Detail Code	Species Scientific Name	Plant Stock Container Size (gallon)	Quantity
A	Forested Buffer	Tree	Black cottonwood	BC	<i>Populus balsamifera</i>	1	75
			Western redcedar	WR	<i>Thuja plicata</i>	1	125
			Bigleaf maple	BM	<i>Acer macrophyllum</i>	1	74
		Shrub	Vine maple	V	<i>Acer circinatum</i>	1	365
			Lady fern	L	<i>Athyrium filix femina</i>	1	365
			Red elderberry	E	<i>Sambucus racemosa</i>	1	365

TABLE 4. GRASS/HERB EROSION CONTROL UPLAND SEED MIX

Species Common Name	Species Scientific Name	Percent by Weight (Seed mix will be applied at a minimum rate of 30 pounds per acre)
White clover	<i>Trifolium repens</i>	20
Annual ryegrass	<i>Lolium perenne</i>	20
Creeping red fescue	<i>Festuca rubra</i>	60

- NOTES:
1. WITHIN FORESTED WETLAND AREA, HARDHACK SHALL BE PLANTED IN CLUMPS AND NOT ASSOCIATED WITH TREES. IT TENDS TO FORM SINGLE-SPECIES STANDS.
 2. WESTERN REDCEDAR AND BIGLEAF MAPLE SHALL BE PLANTED ON MOUNDED AREAS.

PLANTING TABLES

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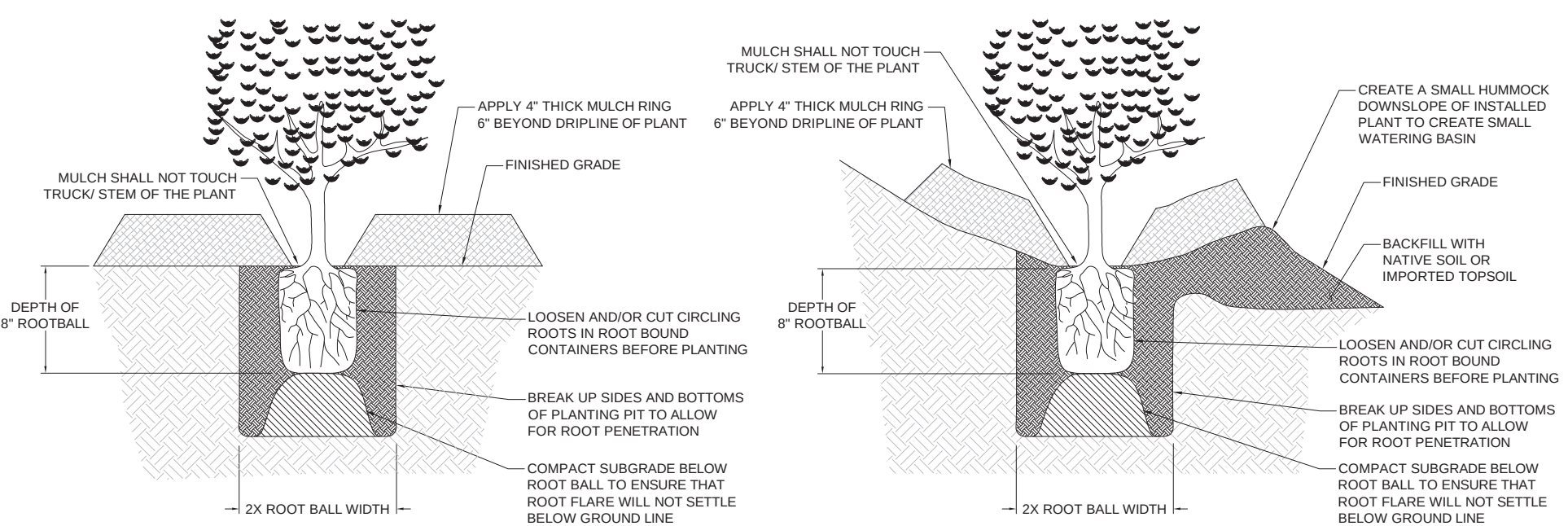
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TAXIWAY F CLEANUP ACTION PROJECT

Port of Skagit County

PLANTING DETAILS

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CHECKED:	DATE: 7/13/2011
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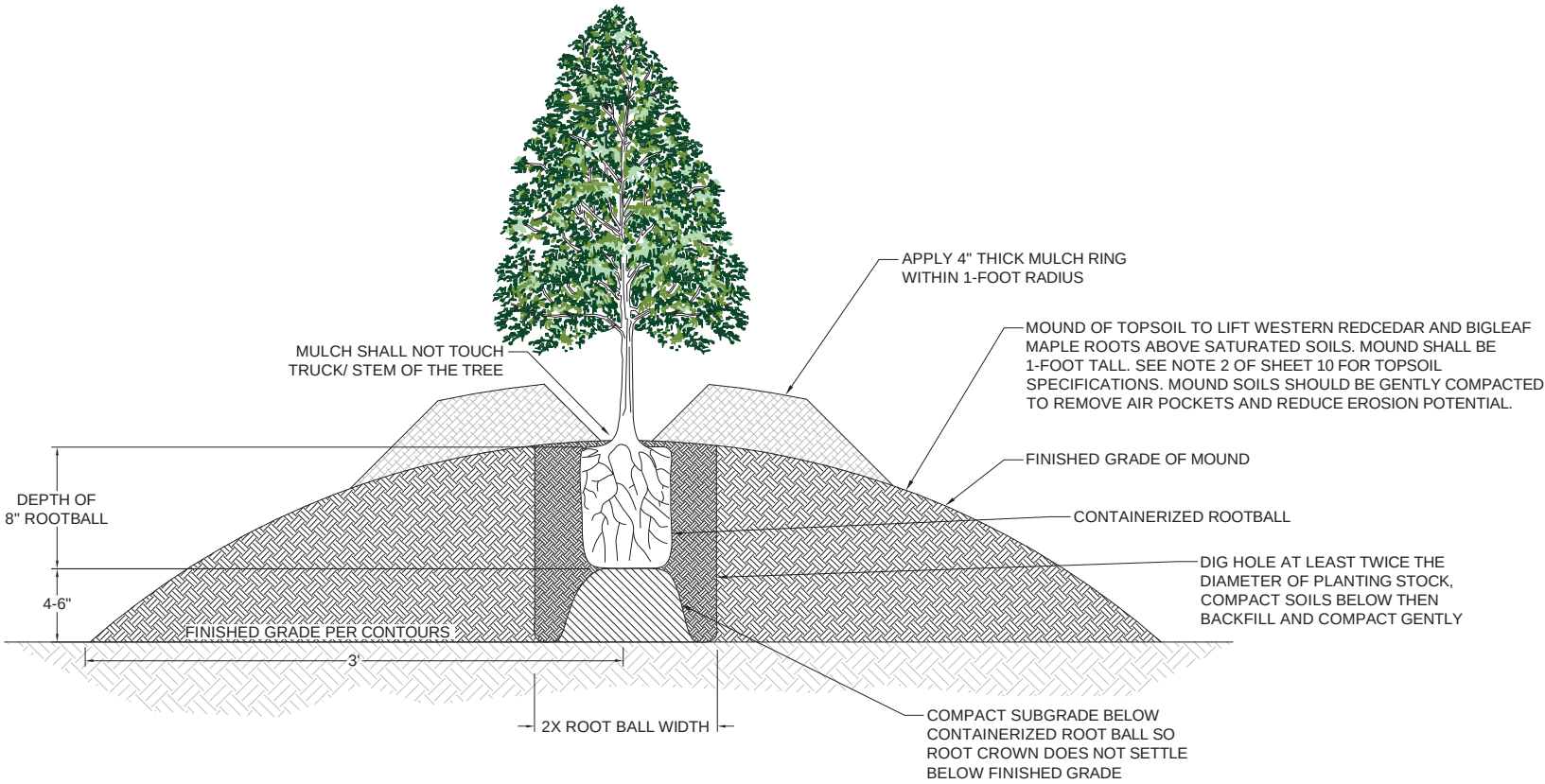


TYPICAL SHRUB AND TREE PLANTING DETAIL FOR FLAT/LEVEL AREAS

NOT TO SCALE

TYPICAL SHRUB AND TREE PLANTING DETAIL FOR SLOPES AND MOUNDED AREAS

NOT TO SCALE



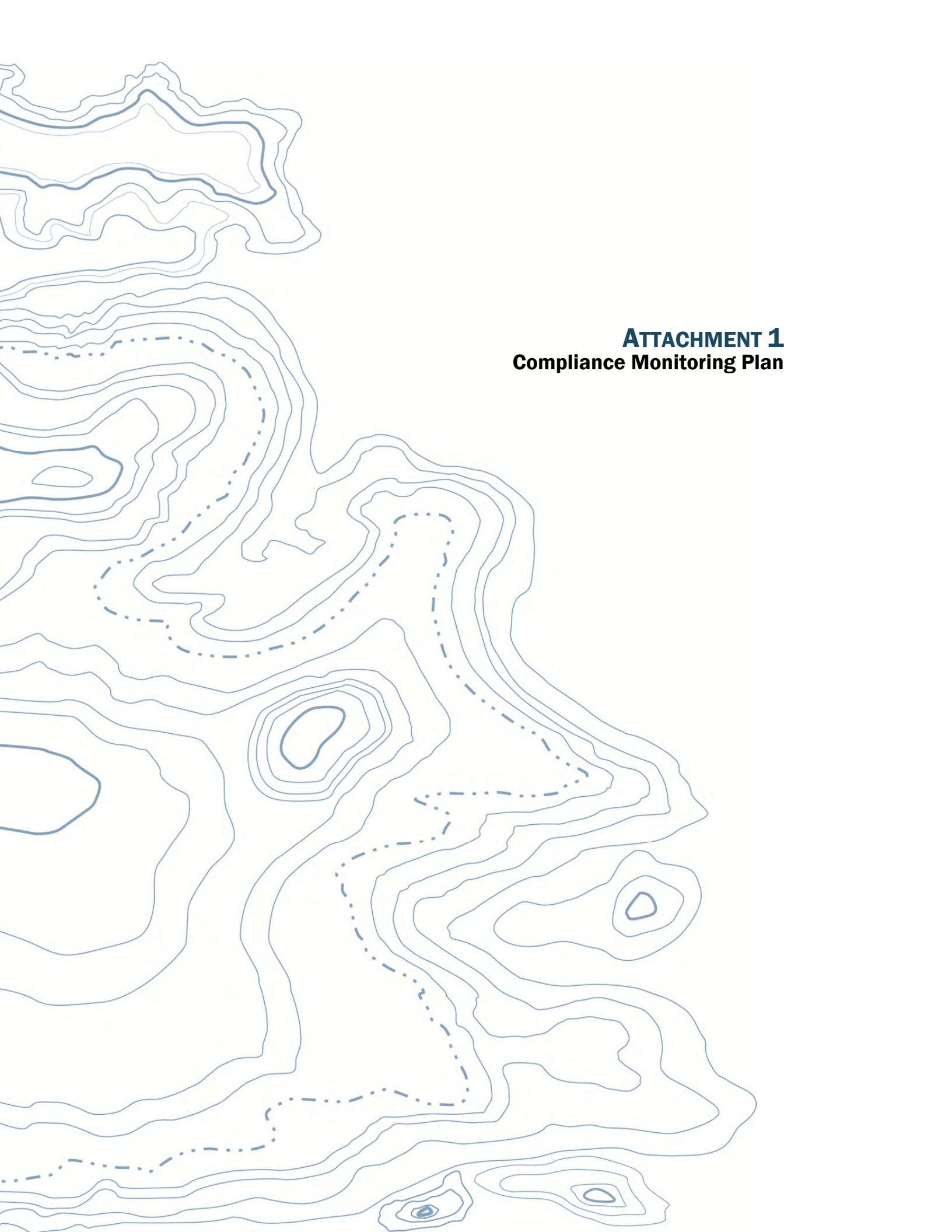
- NOTE:
1. MOUNDED AREAS CAN BE COMBINED TO ACCOMMODATE WITH MORE THAN ONE WESTERN REDCEDAR OR BIGLEAF MAPLE. SHRUBS CAN BE PLANTED ON MOUNDS WITH TREES.
 2. MULCH USED FOR PLANTING WILL BE OBTAINED BY CHIPPING VEGETATION SMALLER THAN 6-INCH DIAMETER COLLECTED DURING CLEARING ACTIVITIES. IMPORT ADDITIONAL MULCH IF REQUIRED.

WESTERN REDCEDAR AND BIGLEAF MAPLE PLANTING DETAIL

NOT TO SCALE

CONTRACT DRAWINGS

ATTACHMENTS

A stylized topographic map in shades of blue and grey, featuring various contour lines and a dashed line path, serving as a background for the document.

ATTACHMENT 1

Compliance Monitoring Plan

Final Compliance Monitoring Plan

Taxiway F Site, Skagit Regional Airport
Burlington, Washington

for

**Washington State Department of Ecology
on Behalf of Port of Skagit County**

July 13, 2011



Plaza 600 Building
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Final Compliance Monitoring Plan
Taxiway F Site, Skagit Regional Airport
Burlington, Washington

File No. 5364-013-03

July 13, 2011

Prepared for:

Washington State Department of Ecology
3190 160th Avenue SE
Bellevue, Washington 98008-5452

On behalf of:

Port of Skagit County
PO Box 348
Burlington, Washington 98233

Prepared by:

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Robert Trahan
Geologist



John M. Herzog, PhD
Principal

RST:JMH:mlh:csv

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Appendix B. Sampling and Analysis Plan (SAP)

Appendix C. Quality Assurance Project Plan (QAPP)

1.0 INTRODUCTION

This document presents a Compliance Monitoring Plan for the cleanup action at the Taxiway F Site (Site) located 3,200 feet east of Farm to Market Road and 600 feet south of Bayview Road on the western side of the Skagit Regional Airport in Burlington, Washington (Figure 1). The Port of Skagit County (Port) is performing the cleanup action under a Washington State Department of Ecology (Ecology) Consent Decree (Ecology, date, Consent Decree No. TBD). The Site is generally located near the western edge of the Skagit Regional Airport is formally referenced in the Ecology databases as the Skagit County Port Site (Ecology facility Site Identification No. 67457634).

Cleanup activities are being completed at the Site to address contamination resulting from historical releases of pesticides and herbicides stored at the Site pursuant to the Remedial Investigation/Feasibility Study (RI/FS; GeoEngineers, 2011a) and Cleanup Action Plan (CAP; GeoEngineers, 2011b). This Compliance Monitoring Plan has been prepared in accordance with WAC 173-340-410 to describe the performance and confirmation monitoring to be performed to verify the effectiveness of the cleanup action and is intended to be used in conjunction with the project Engineering Design Report (GeoEngineers, 2011c).

2.0 BACKGROUND

2.1. Previous Site Investigations

Several environmental investigations have been conducted at the Site, beginning with an initial soil investigation in 2000 (EAI, 2000), and culminating in the RI/FS completed in 2010 (GeoEngineers, 2011a). Investigations conducted prior to 2009 are summarized in the RI/FS Work Plan (GeoEngineers, 2009). The RI/FS Report (GeoEngineers, 2011a) presents the results of the RI sampling activities conducted in 2009 and 2010, and uses the results of the RI and earlier investigations to characterize the nature and extent of contamination.

As described by the RI/FS and CAP, the Site is divided into three areas: (1) the Historical Operations Area, which comprises approximately 2.2 acres and includes the hangar building and an asphalt-paved aircraft apron; (2) the Drainage Channel, a shallow, narrow swale that connects the historical operations area to a mixed coniferous-deciduous forest to the east; and (3) the Wetland Area, which is southeast of the historical operations area and is classified as a forested wetland. Figure 2 shows the approximate location of these three areas relative to the Site. During wet weather conditions, the drainage channel captures rainwater runoff from the Historical Operations Area and conveys it to the Wetland Area.

Detailed information describing the Site including its known history, current uses, existing property features, soil and groundwater conditions are presented in the RI/FS Work Plan (GeoEngineers, 2009) and RI/RS Report (GeoEngineers, 2011a).

2.2. Nature and Extent of Contamination

2.2.1. Soil

Soil sampling completed between 2000 and 2010 within the Historical Operations Area, the Wetland Area, and the Drainage Channel connecting the Historical Operations Area to the Wetland Area (Figure 2), indicated that shallow soil contain contaminants of concern (COCs; pesticides [aldrin, total chlordane, DDT, dieldrin, endosulfan heptachlor toxaphene] and herbicides [atrazine, chlorothalonil, dinoseb, pentachlorophenol, terbutryn, trifluralin, vernolate]) at concentrations greater than Site cleanup levels. These exceedances are limited to samples obtained from the upper 1 foot of soil and with the highest concentrations occurring in the upper 6 inches of soil. However, sampling data indicate that COC exceedances extend to a depth of up to 2 feet below ground surface (bgs) in the eastern portion of the Historical Operations Area and central portion of the Wetlands Area. Soil analytical results from the tree root-base sampling in the Wetlands Area showed that contamination does not extend to the root bases of the mature conifer trees, and is concentrated in the lower topographical areas.

2.2.2. Groundwater

Groundwater sampling completed during 2009 and 2010 indicate that shallow (perched) groundwater exceeds Site cleanup levels for pesticides (heptachlor epoxide) and herbicides (2,4-dichlorophenoxyacetic acid [2,4-D], bentazon, dinoseb and 2-methyl-4-chlorophenoxy-acetic acid [MCPA]) at monitoring well locations GEI-MW-4, GEI-MW-6, GEI-MW-7, and GEI-MW-8. The highest concentrations of dinoseb, MCPA, and heptachlor epoxide were detected in GEI-MW-8; the highest concentration of bentazon was detected in GEI-MW-4. Based on Site investigation results, bentazon exceedances are concentrated in the northern portion of the Historical Operations Area. Dinoseb, MCPA and heptachlor epoxide exceedances are concentrated in the northern and eastern portions of the Historical Operations Area and along the Drainage Channel between the Historical Operations Area and the Wetland Area. Perched groundwater in the southwestern portion of the Historical Operations Area (at well location GEI-MW-5) does not exceed cleanup levels. Additionally, pesticides (DDT and endosulfan) and herbicides (dinoseb) were detected at concentrations exceeding cleanup levels in shallow groundwater grab samples obtained in 2001 from direct-push borings B-2, B-5, and B-7 (GeoEngineers, 2001). As discussed in the RI/FS Work Plan (GeoEngineers, 2009), the previous exceedances reported at direct-push locations B-2, B-5, and B-7 are not considered definitive data because these groundwater samples were not obtained from monitoring wells.

2.2.3. Surface Water

Pesticides, herbicides, and arsenic have been detected in historical surface water (rainwater runoff) grab samples collected at the Site. Endosulfans (detected in 12 of 13 samples) were the most prevalent COC detected in the samples (GeoEngineers, 2011a). However, surface water at the Site is not considered to be a separate environmental medium requiring further remedial action because: (1) it is a temporary surface manifestation of perched groundwater during the wet season, or is present only ephemerally during the dry season following large rainfall events; and (2) it is not hydraulically connected to any nearby permanent surface water bodies.

3.0 COMPLIANCE MONITORING

Compliance monitoring will be implemented during the Site cleanup action in accordance with the CAP and 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 sections.

3.1. Protection Monitoring

Protection monitoring will include monitoring of worker health and safety and environmental protection practices such as stormwater, erosion, and sediment controls. The purpose of protection monitoring is to confirm that human health and the environment are adequately protected during the cleanup action.

3.1.1. 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. A Site-specific health and safety plan (HASP) applicable to GeoEngineers' work is included as Appendix A. The Port's construction Contractor will be required to prepare and submit a separate HASP for use by the Contractor's personnel. Personnel engaged in work that involves hazardous material excavation and handling shall comply with the provisions of WAC 173-340-810 (MTCA Cleanup Regulation, Worker Safety and Health) and be HAZWOPER, OSHA, and WISHA certified.

3.1.2. Environmental Protection

Environmental protection measures consisting of best management practices (BMPs) for stormwater, sediment, drainage, and erosion control; spill prevention and pollution control; and all other controls needed to protect environmental quality will be implemented. Environmental protection measures including a Spill Prevention and Control Plan (SPCC) will be detailed in the contractor's Construction Quality Control Plan. The Contractor will be required to conform with all permits for the project and implement the Ecology-approved Stormwater Pollution Prevention Plan (SWPPP) including installation, inspection and maintenance necessary for stormwater management, surface water runoff control, temporary erosion and sediment control measures, and SPCC measures, as necessary, for the duration of the project. The minimum standards for environmental protection measures that will be implemented are described in the Engineering Design Report (GeoEngineers, 2011). If the Port or any governmental agency determines that the Contractor's environmental protection measures are inadequate to meet the intent of applicable regulations, the Contractor will be required to implement additional stormwater runoff, erosion control, or SPCC measures to address the deficiencies.

3.2. Performance Monitoring

Performance monitoring will be conducted to verify that the cleanup action attains soil cleanup standards established for the Site. This section describes performance monitoring methods including verification of soil excavation elevations, soil verification sampling and chemical characterization of soil verification samples.

3.2.1. Verification of Soil Excavation Elevations

Performance monitoring following soil excavation will initially include topographic surveys to verify that excavation area has achieved the required cut elevations. Surveys will also be performed upon completion of backfilling activities to verify conformance with the design backfill elevations.

3.2.2. Soil Verification Sampling

Remedial excavation activities will be completed laterally to the extent of the clean sampling locations established as part of the Remedial Investigation. Control points defining the clean limit perimeter are defined by existing soil sample locations in which detected contaminant concentrations are less than Site cleanup levels. In the event that excavation to the control points is determined in the field to be infeasible, verification samples will be collected from the excavation sidewall, as appropriate, to assess the completeness of the contaminated soil removal. If contaminated soil extends beyond the sidewall, Ecology shall be notified and additional actions meeting Ecology's approval will be identified and implemented. The base of the remedial excavation will extend vertically until the planned cut elevations have been verified within the remedial excavation area. Verification soil samples will be obtained from the base of the excavation to verify that the soil cleanup levels have been achieved. If base samples exceed soil cleanup levels, over-excavation and reconfirmation sampling will be completed.

Soil verification sampling will be conducted as follows:

- Collect discrete samples from the base of the remedial excavation at a rate of at least one soil sample per 625 square feet of excavation base within each excavation unit (Units A through T) established for the project as shown on Figure 3. If it is necessary to make adjustments to the sample locations shown on Figure 3 based on field conditions, Ecology will be notified and new sample locations selected in consultation with Ecology.
- As described in the CAP, soil verification samples will be analyzed for total endosulfan (indicator hazardous substances for soil established for the Site; GeoEngineers, 2011) using EPA method 8081A-GC/ECD. To the extent practical, 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.
- If all verification sample results for indicator hazardous substances do not exceed Site cleanup levels, no further excavation will be performed. If any base verification sample result exceeds Site cleanup levels, additional excavation will be performed to remove soil represented by the exceedances. Following each additional excavation, the same number of verification samples as collected initially in the area excavated will be obtained from the base of the extended excavation, as appropriate, to verify that the cleanup levels have been achieved. The lateral limits of the over-excavation will be extended to the "Limit of Excavation" established by the

control points and/or to clean verification sample locations. A minimum of four control point and/or clean verification sample locations will be used to define the limit of the over-excavation (Conceptual Over-Excavation Plan, Figure 3). The Port may elect to obtain and analyze supplemental verification samples to refine the limits of the over-excavation.

- In the event that excavation to the control points is determined in the field to be infeasible, discrete samples will be collected from the sidewall of the remedial excavation at a rate of at least 1 soil sample per 40 linear feet of excavation sidewall to assess whether the cleanup levels have been achieved. If sidewall verification sample results exceed Site cleanup levels, Ecology shall be notified and additional actions meeting Ecology's approval will be identified and implemented.

3.3. Confirmational (Post-Construction) Monitoring

Confirmational monitoring will be performed after the Site cleanup action is completed to evaluate the post-construction effectiveness of the cleanup action. This section describes confirmational groundwater monitoring for the Site.

3.3.1. Groundwater Monitoring

Confirmational groundwater monitoring will be performed after the completion of remedial excavation and site restoration activities to evaluate the long-term effectiveness of the cleanup action. Groundwater samples will be obtained from four consecutive monitoring events, no less than three months apart, in which groundwater is observed in each confirmational groundwater monitoring well. Groundwater samples will be obtained from four replacement wells that will be drilled and installed near the current locations of monitoring wells GEI-MW4, GEI-MW6, GEI-MW7, and GEI-MW8 (locations where the previous remedial investigations identified concentrations of pesticides and/or herbicides exceeding groundwater cleanup levels) which will be removed/decommissioned during the cleanup action. The location of the replacement wells are shown on Figure 4. Groundwater samples obtained from Site monitoring wells will be analyzed for dinoseb, bentazon, 2,4-D, MCPA, aldrin, dieldrin, heptachlor, and heptachlor epoxide, the indicator hazardous substances for groundwater as established in the CAP. Chemical analyses of these parameters will use EPA method 8081A-GC/ECD.

If one or more of the hazardous indicator substances are detected at concentrations exceeding the Site cleanup levels, additional compliance groundwater monitoring may be completed, at the approval of Ecology. If additional compliance groundwater monitoring is necessary based on the results of the four events, sampling frequency and groundwater hazardous indicator substances will be determined based on discussions between the Port and Ecology.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance/quality control (QA/QC) procedures and standards that will be implemented during the Taxiway F Site cleanup action and subsequent compliance groundwater monitoring activities are presented in the Sampling and Analysis Plan (SAP; Appendix B) and Quality Assurance Project Plan (QAPP; Appendix C). The purpose of these documents is to describe soil and groundwater sampling, analysis and quality control procedures that will be implemented to produce

chemical and field data that are representative, valid and accurate for use in evaluating the cleanup action effectiveness.

5.0 SCHEDULE

Pending permit approvals, cleanup-related construction work is scheduled to begin within 30 days of Ecology approval of the Final Engineering Design Report and estimated to occur over a period of 3 to 6 months beginning in August 2011.

6.0 REPORTING

Following 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 draft version of the construction completion report will be submitted to Ecology for review and comment prior to finalization. A report summarizing the results of compliance groundwater monitoring will be prepared upon completion of the four quarterly compliance 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.

7.0 LIMITATIONS

We have prepared this Compliance Monitoring Plan for use by Ecology and the Port of Skagit County during the cleanup action at the Taxiway F Site. Within the limitations of scope, schedule and budget, our 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, express 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 will serve as the official document of record.

8.0 REFERENCES

Environmental Associates, Inc. (EAI), "Soil Sampling and Testing. Skagit Farmers Supply – Port of Skagit Lease Property, Skagit County Airport, Skagit County, Washington," Report JN 20250, dated September 19, 2000.

GeoEngineers, Inc., "Report: Supplemental Soil and Groundwater Sampling, Former Skagit Farmers Supply Site, Skagit County, Washington." GEI File No. 5364-003-01-1150, dated July 6, 2001.

GeoEngineers, Inc., “Final Work Plan, Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158.” GEI File No. 5364-013-00, dated July 31, 2009.

GeoEngineers, Inc. (2011a), “Draft Final Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158.” GEI File No. 5364-013-02, dated January 10, 2011.

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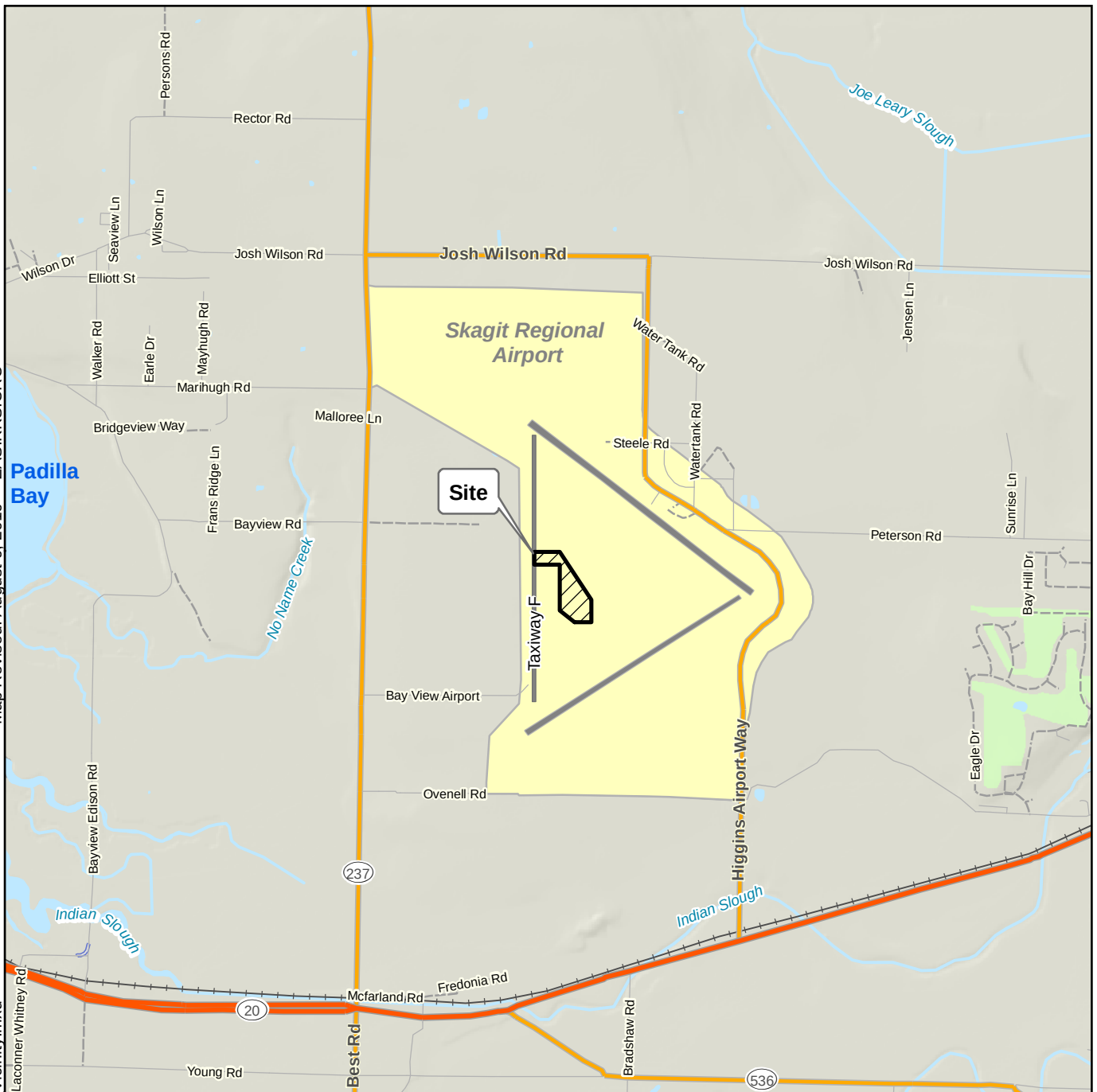
GeoEngineers, Inc. (2011c), “Engineering Design Report, Taxiway F Site, Skagit Regional Airport, Burlington, Washington.” GEI File No. 5364-013-03, dated July 15, 2011.

Washington State Department of Ecology (Ecology), “Natural Background Soil Metals Concentrations in Washington State,” Publication 94-115, dated October 1994.

Map Revised: August 9, 2010 ZAS:KKS:CRC

Path: P:\5364013\GIS\536401302 FIG-1 Vicinity.mxd

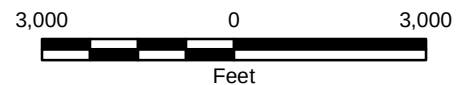
Office: SEA



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

Taxiway F Site
Burlington, Washington



Figure 1



Legend

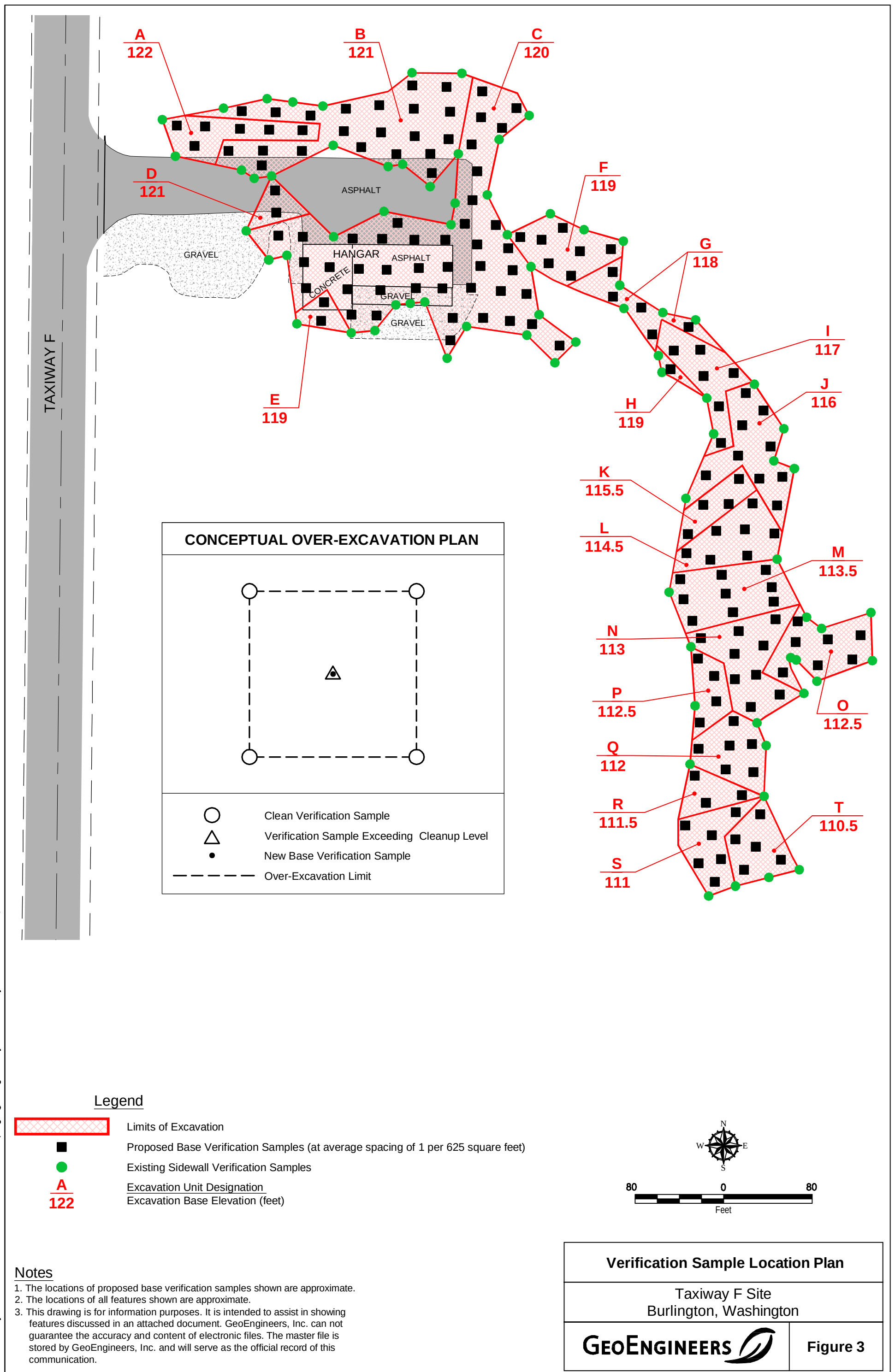
	Shallow Monitoring Well		Historical Operations Area		Drainage Channel (Approximate Rainwater Runoff/Flow Direction)
	Deep Monitoring Well		Fence Line		Wetland Area (Approximate Extent Based on Hart Crowser Wetland Restoration Plan [Hart Crowser, 2008a])
	Water Supply Well		Debris Area		

Site Plan	
Taxiway F Site Burlington, Washington	
	Figure 2

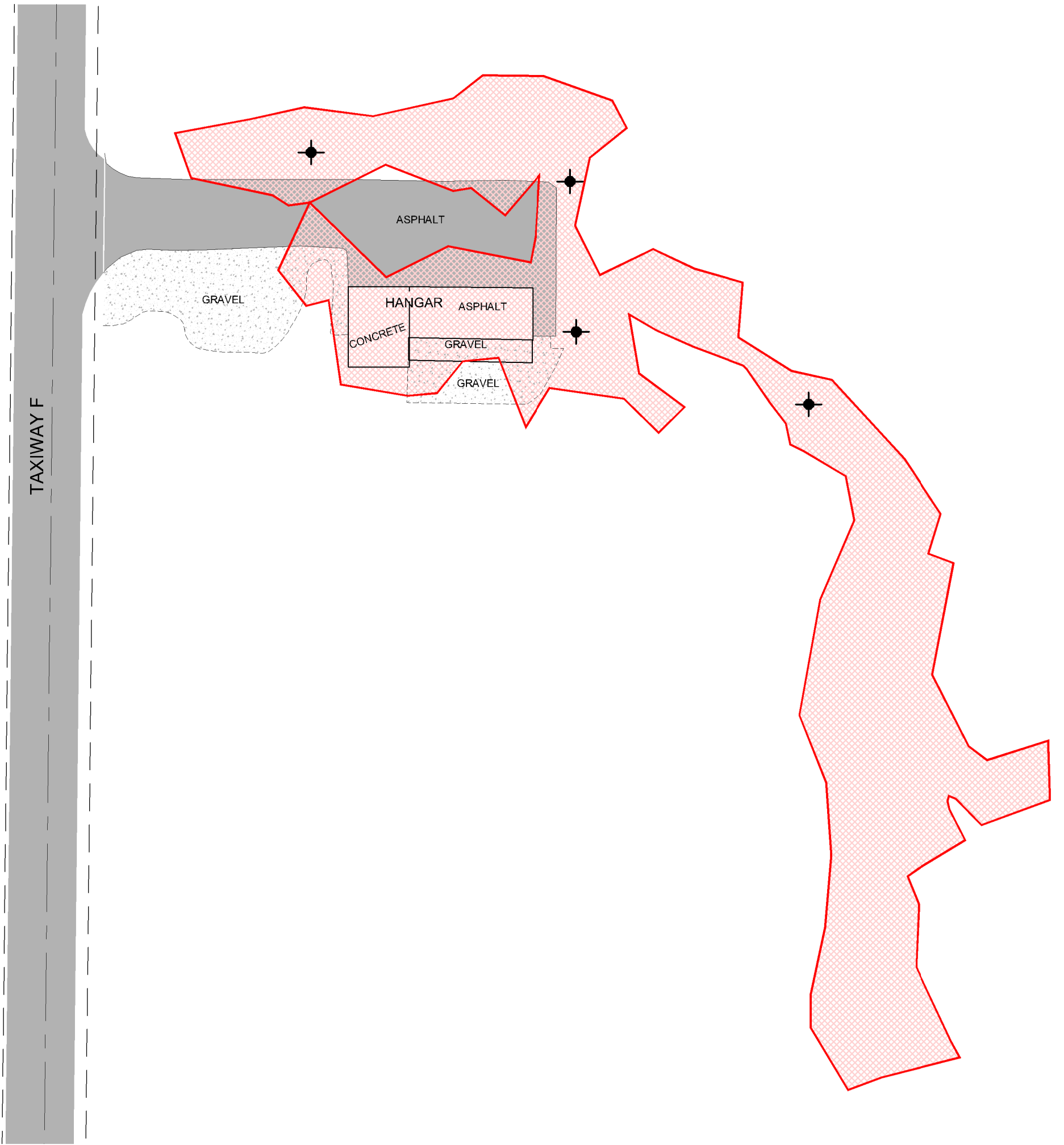
Reference: Aerial photo (dated 2004) from Skagit County. Historical Operations Area boundary, fence line, and rainwater runoff/flow direction obtained from Hart Crowser Focused RI/FS Addendum (Hart Crowser, 2008b).

Notes:

- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot 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.



W:\Seattle\Projects\51536401\3103\CAD\536401\303 GW Sample Locations Fig 4.dwg(TAB:layout modified by tmichaud on Jun 10, 2011 - 12:50



Legend



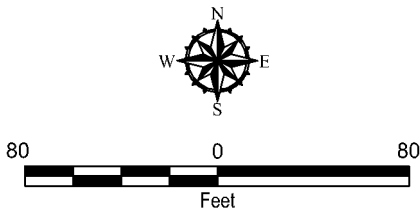
Limits of Excavation



Post-Construction Groundwater Monitoring Well Location
(replaced at original RI monitoring well location)

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.

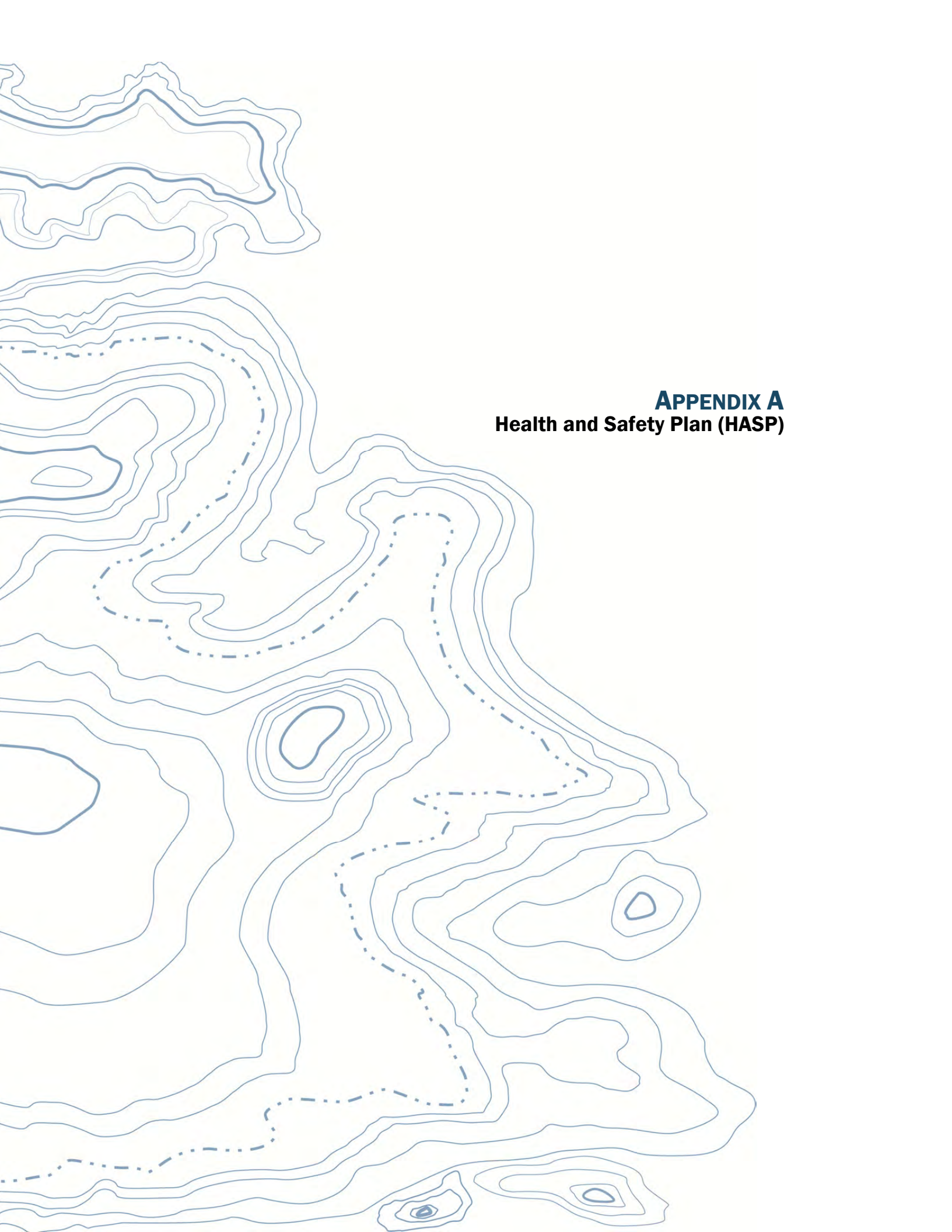


Post-Construction Groundwater
Monitoring Well Plan

Taxiway F Site
Burlington, Washington

GEOENGINEERS

Figure 4



APPENDIX A

Health and Safety Plan (HASP)

Final Health and Safety Plan (HASP)

Taxiway F Site, Skagit Regional Airport
Burlington, Washington

for

**Washington State Department of Ecology
on Behalf of Port of Skagit County**

July 13, 2011



Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, Washington 98101
206.728.2674



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SITE HEALTH AND SAFETY PLAN

Taxiway F Site, Skagit Regional Airport

Burlington, Washington

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 need to 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.

Liability Clause: If requested by subcontractors, this Site safety plan may be provided for informational purposes only. In this case, Form C-3 shall be signed by the subcontractor. Please be advised that this Site Safety Plan is intended for use by GeoEngineers Employees only. Nothing herein shall be construed as granting rights to GeoEngineers' subcontractors or any other contractors working on this Site to use or legally rely on this Site Safety Plan. GeoEngineers specifically disclaims any responsibility for the health and safety of any person not employed by them.

1.0 GENERAL PROJECT INFORMATION

Project Name:	<u>Taxiway F Site, Skagit Regional Airport</u>
Project Number:	<u>5364-013-03</u>
Type of Project:	<u>Construction Monitoring, soil and groundwater sampling, monitoring well installation and restoration monitoring.</u>
Start/Completion:	<u>Cleanup-related construction work is scheduled to begin within 30 days of Ecology approval of the Final Engineering Design Report and estimated to occur over a period of 3 to 6 months beginning in August 2011.</u>
Subcontractors:	<u>Drilling Contractor Construction Contractor Survey Contractor</u>

2.0 WORK PLAN

GeoEngineers will oversee a cleanup action for the Port of Skagit County's (Port's) Taxiway F Site (Site). The purpose of this cleanup action is to address contamination resulting from historical releases of pesticides and herbicides stored at the Site. As part of the Cleanup Action, our scope includes:

- Assisting the cleanup contractor in identifying and removing contaminated soil from the Site for permitted disposal.
- Obtaining soil samples from the limits of excavation and submit samples to an Ecology accredited laboratory for chemical analysis of endosulfans (indicator hazardous substance).
- Installation and development of groundwater monitoring wells.
- Obtaining groundwater samples from monitoring wells and submit samples to an Ecology accredited laboratory for chemical analysis of dinoseb, bentazon, 2,4-D, MCPA, aldrin, dieldrin, heptachlor, and heptachlor epoxide (indicator hazardous substances).
- Re-vegetation/site restoration oversight following completion of remedial excavation activities.
- Site surveying.

2.1. Site Description

The Taxiway F Site is generally located 3,200 feet east of Farm to Market Road and 600 feet south of Bayview Road on the western side of the Skagit Regional Airport in Burlington, Washington. The Site is currently owned by the Port and is located on property classified by Skagit County as Aviation Related (AVR) zoning. The Port currently uses the hangar building for storage of maintenance equipment. The Port has no plans to rezone the property, and does not anticipate any future changes to the current land use (light industrial).

2.2. Site History

In 1933, a single runway was constructed for light airplanes. This original runway would later become Taxiway F. In 1943 the U.S. Navy constructed the airport's current two-runway system as an alternate training field for the Whidbey Island Naval Air Station. After World War II, the federal government continued to operate the airport, primarily for the Civil Air Patrol, until transferring the facility to Skagit County in 1958. In 1965 the airport was conveyed to the joint ownership of Port of Anacortes and Port of Skagit County. The Port assumed full ownership and operation of the airport in 1975. Prior to 1978, the Site and the surrounding property were used for cattle grazing and farm equipment storage by Ray Jensen, John Petter, and Peth and Sons.

Between 1978 and 2000, the Port leased the portion of the Site immediately adjacent to the taxiway to a series of individuals and companies engaged in the business of crop dusting. In 1978, the Port leased the property to Swanland-Karr, Inc. for crop dusting operations. In 1982, Swanland-Karr, Inc. proposed to construct the hangar building that currently exists at the Site for aircraft parking and materials storage, including storage of chemicals used for crop dusting. William Swanland and Swanland-Belisle, Inc. leased the property in 1985; pesticide products used by the lessee were reported in 1988 to include Dinoseb, Parathion, Thiodon, Chemho-IPC, and Simazon. Environmental review of the leased property performed in 1988 by the Port identified staining in some of the work areas and an apparent oil release on the property. The Port provided the results of the environmental review and suggestions for addressing the identified issues to the lessee. In 1992, the lease was assigned to Belisle Bros. Crop-Dusting, Inc. for continued use for crop dusting activities. In 1993, the lease of the Site property was assigned to Curt Tronsdal and Tronsdal Air Service, Inc. In 1998, the lease of the Site property was assigned to Skagit Ag Services, Inc., which leased the property until the Port discontinued leasing the property in 2000.

2.3. List of Field Activities

Check the activities to be completed during the project

☒ Site reconnaissance	☐ Field Screening of Soil Samples
☐ Exploratory Borings	☐ Vapor Measurements
☒ Construction Monitoring	☒ Groundwater Sampling
☒ Surveying	☐ Groundwater Depth and Free Product Measurement
☐ Test Pit Exploration	☐ Product Sample Collection
☒ Monitoring Well Installation	☐ Soil Stockpile Testing
☒ Monitoring Well Development	☒ Remedial Excavation
☒ Soil Sample Collection	☒ Paving
☐ Remediation System Monitoring	☒ Landscaping/Wetland Restoration

3.0 LIST OF FIELD PERSONNEL AND TRAINING

Anticipated field personnel include the following:

- Fasih Khan
- Abhijit Johsi
- Robert Trahan
- Fiona McNair
- Brian Anderson

Field personnel will have appropriate training and up to date certifications.

4.0 CHAIN OF COMMAND

Chain of Command	Title	Name	Telephone Numbers
1	Project Manager	John Herzog	(c) 206.406.6431
2	HAZWOPER Supervisor	Robert Trahan	(o) 206.239.3253 (c) 206.240.2300
3	Field Engineer/Geologist	Fasih Khan Abhijit Joshi Brian Anderson Fiona McNair	(c) 425.444.3295 (c) 425.223.9028 (c) 425.750.1326 (c) 360.269.6714
4	Site Safety and Health Supervisor*	Abhijit Joshi	(o) 206.239.3256 (c) 425.223.9028

Chain of Command	Title	Name	Telephone Numbers
5	Client Assigned Site Supervisor	TBD	TBD
6	Health and Safety Program Manager	Wayne Adams	(o) 253.383.4940 (c) 253.350.4387
N/A	Subcontractor(s)	TBD	TBD
N/A	Current Owner	Port of Skagit County representative Sarah Young	(o) 360.757.0011

* **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.

5.0 EMERGENCY INFORMATION

Hospital Name and Address:

Skagit Valley Hospital
1415 East Kincaid
Mount Vernon, Washington 98273

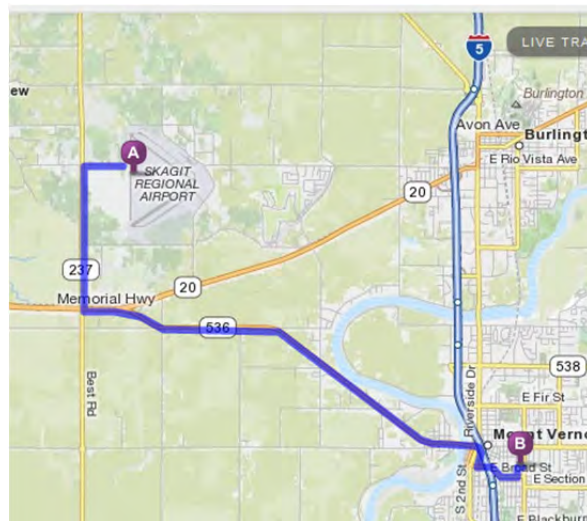
Phone Numbers (Hospital ER):

Phone: (360) 424-4111

Distance:

7.8 Miles

1. Start out going West on Bay View Road toward Farm to Market Road
2. Take the 1st Left onto Farm to Market Road
3. Turn Left onto WA-20 East
4. Turn Slight Right onto WA-536
5. Stay Straight to go onto E Broad Street
6. Turn Left onto S 13th Street.
7. Take the 2nd Right onto E Kincaid Street



6.0 STANDARD EMERGENCY PROCEDURES

■ Get help

- Send another worker to phone 9-1-1 (if necessary)
- As soon as feasible, notify GeoEngineers' Project Manager

■ Reduce risk to injured person

- Turn off equipment
- Move person from injury location (if in life-threatening situation only)
- Keep person warm
- Perform CPR (if necessary)

■ 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

7.0 HAZARD ANALYSIS

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.

7.1. Physical Hazards

<u> X </u>	Drill rigs
<u> X </u>	Backhoe
<u> X </u>	Trackhoe
<u> </u>	Crane
<u> X </u>	Front End Loader
<u> X </u>	Excavations/trenching (1:1 slopes for Type B soil)
<u> X </u>	Shored/braced excavation if greater than 4 feet of depth
<u> X </u>	Overhead hazards/power lines
<u> X </u>	Tripping/puncture hazards (debris on-site, steep slopes or pits)
<u> X </u>	Unusual traffic hazard – Truck and Trailer traffic
<u> X </u>	Heat/Cold, Humidity
<u> X </u>	Utilities/utility locate

- Work areas will be marked with reflective cones, barricades and/or caution tape. High-visibility vests will be worn by on-site personnel to ensure they can be seen by vehicle and equipment operators.
- Field personnel will be aware at all times of the location and motion of heavy equipment in the area of work to ensure a safe distance 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 that it is safe to do so through hand signal or other acceptable means.

- 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.
- 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 DOSH/OSHA 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/or the GeoEngineers Health and Safety Program.
- Personnel will avoid tripping hazards, steep slopes, pits and other hazardous encumbrances. If it becomes necessary to work within 6 feet of the edge of a pit, slope 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 Health and Safety Program.
- Cold stress control measures will be implemented according to the GeoEngineers Health and Safety Program to prevent frost nip (superficial freezing of the skin), frost bite (deep tissue freezing), or hypothermia (lowering of the core body temperature). Heated break areas and warm beverages shall be available during periods of cold weather.
- Heat stress control measures required for this Site will be implemented according to GeoEngineers Health and Safety Program with water provided on-site.
- Excessive levels of noise (exceeding 85 dBA) are anticipated during drilling. 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 3 feet away from a co-worker or whenever noise levels become bothersome. (Increasing the distance from the source will decrease the noise level noticeably.)

7.2. Engineering Controls

☒	Trench shoring (1:1 slope for Type B Soils)
☒	Location work spaces upwind/wind direction monitoring
☒	Other soil covers (as needed)
☒	Other (specify): Dust control

7.3. Chemical Hazards

CHEMICAL HAZARDS (POTENTIALLY PRESENT AT SITE)

Substance	Pathways
Chlorinated Pesticides	Soil/Water
Herbicides	Soil/Water
VOCs	Soil/Water
Metals Arsenic	Soil/Water

SPECIFIC CHEMICAL HAZARDS AND EXPOSURES (POTENTIALLY PRESENT AT SITE)

Compound/ Description	Exposure Limits/Idlh	Exposure Routes	Symptoms/Health Effects
Arsenic	PEL 0.05 mg/m ³ IDLH 5.0 mg/m ³	Inhalation, skin absorption, skin and eye contact, ingestion	Ulceration of nasal septum; dermatitis; GI disturbances; peripheral neuropathy; respiratory irritation; hyperpigmentation of skin
Endosulfan	PEL: Not Available TLV: 0.1 mg/m ³ (8-hour)	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Endosulfan is highly toxic via the oral route, and may be only slightly toxic via inhalation, with a reported inhalation LC50 of 21 mg/L for 1 hour, and 8.0 mg/L for 4 hours. Stimulation of the central nervous system is the major characteristic of endosulfan poisoning. Symptoms noted in acutely exposed humans include those common to the other cyclodienes, such as incoordination, imbalance, difficulty breathing, gagging, vomiting, diarrhea, agitation, convulsions and loss of consciousness.

Compound/ Description	Exposure Limits/Idlh	Exposure Routes	Symptoms/Health Effects
DDT	PEL for DDT is 1 mg/m ³ for an 8-hour average with a skin notation	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Irritation to eyes, skin; paresthesia in the tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise (vague feeling of discomfort), headache, lassitude (weakness, exhaustion); convulsions; paresis in the hands; vomiting; [potential occupational carcinogen].
DDE	TLV 0.1 mg/m ³ (8 hour exposure)	Inhalation, skin absorption, ingestion, skin and/or eye contact.	
Endosulfan Sulfate	TLV 0.3 mg/m ³ (15 minute exposure) RFD 0.00005 mg/kg/day (EPA); 0.0015 mg/kg/day (OPP) LEL 0.75 mg/kg/day (rat) lowest effect level	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Highly toxic chlorinated hydrocarbon insecticide and carries the signal word DANGER on the label. Undiluted endosulfan is slowly and incompletely absorbed into the body, whereas absorption is more rapid in the presence of alcohols, oils and emulsifiers.
Aldrin	PELs for aldrin and dieldrin are 0.25 mg/m ³ (ACGIH) for an 8-hour average	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Headache, dizziness; nausea, vomiting, malaise (vague feeling of discomfort); myoclonic jerks of limbs; clonic, tonic convulsions; coma; hematuria (blood in the urine), azotemia; potential occupational carcinogen.
Chlordane	PEL for Chlordane is 0.5 mg/m ³ (8-hour).	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Acute effects of chlordane in humans consist of gastrointestinal distress and neurological symptoms, such as tremors and convulsions. Chronic (long-term) inhalation exposure of humans to chlordane results in effects on the nervous system. Poisoning victims may appear agitated or excited, but later they may become depressed, uncoordinated, tired or confused. Other symptoms reported in cases of chlordane poisoning include headaches, dizziness, vision problems, irritability, and weakness or muscle twitching. In severe cases, respiratory failure and death may occur.

Compound/ Description	Exposure Limits/Idlh	Exposure Routes	Symptoms/Health Effects
Lindane	PEL for Lindane is 0.5 mg/m ³ (ACGIH) for an 8-hour average with a skin notation.	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Irritation to eyes, skin, nose, throat; headache; nausea; clonic convulsions; respiratory difficulty; cyanosis; aplastic anemia; muscle spasm; in animals: liver, kidney damage.
Dinoseb	No OSHA PEL or NIOSH/ACGIH limits	Inhalation, skin absorption, ingestion, skin and/or eye contact.	Fatigue, thirst, sweating, insomnia, weight loss, headache, flushing of the face, nausea, abdominal pain and occasional diarrhea.

Notes:

IDLH = immediately dangerous to life or health
 OSHA = Occupational Safety and Health Administration
 ACGIH = American Conference of Governmental Industrial Hygienists
 mg/m³ = milligrams per cubic meter
 TWA = time-weighted average (Over 8 hrs.)
 PEL = permissible exposure limit
 TLV = threshold limit value (over 10 hrs)
 STEL = short-term exposure limit (15 min)
 ppm = parts per million

Groundwater Sampling: Splash hazard associated with groundwater extraction and sample collection. Possible corrosion hazard associated with sample preservatives. Wear protective clothing and eye protection and chemical-resistant gloves are required when handling samples.

Sample handling, packaging, and processing: Skin contact with contaminated media and preservative acids. Wear modified Level D PPE.

Decontamination of equipment: Inhalation or eye contact or skin contact with airborne mists or vapors, or contaminated liquids. Wear safety glasses; decontaminate clothing and skin prior to eating, drinking or other hand to mouth contact.

8.0 BIOLOGICAL HAZARDS AND PROCEDURES

Y/N	Hazard	Procedures
Y	Poison Ivy or other vegetation	Hard hat, gloves and long sleeve shirt
Y	Insects or snakes	Hard hat, gloves and long sleeve shirt
	Used hypodermic needles or other infectious	
N	Hazards	Do not pick up or contact
	Others:	

8.1. Additional Hazards

Update in Daily Report. 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, pollen, bees/wasps and others present)

9.0 AIR MONITORING PLAN

Work upwind if at all possible.

Check instrumentation to be used:

_____ Photoionization Detector (PID)

_____ Other (i.e., detector tubes): _____

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

_____ Hourly (in breathing zone during excavations, drilling, sampling)

Additional personal air monitoring for specific chemical exposure:

Dust/Metals/Pesticides/Herbicides

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

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 ppm in breathing zone	Use Level D or Modified Level D PPE

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	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 Health and Safety Manager for guidance.
Combustible Atmosphere	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes	>10% LEL or >1,000 ppm	Depends on contaminant. The PEL is usually exceeded before the lower explosive limit (LEL).
Combustible Atmosphere	Environmental Remedial Actions	PID or 4-gas meter	Start of shift; prior to excavation entry; every 30 to 60 minutes	>10% LEL or >1,000 ppm	Stop work and evacuate the Site. Contact Health and Safety Manager 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, evacuate area and contact Health and Safety Manager.

10.0 SITE CONTROL PLAN

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

10.1. 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.

10.2. Site Work Zones

Site work zones (Construction Staging Areas, Soil stockpiling areas) are demarcated on in the Port Contract Documents. In general, hot zones/exclusion zones will be located around each excavation. Only persons with the appropriate training will enter this perimeter while work is being conducted there.

A contamination reduction zone will be established just outside the exclusion zone for the decontamination of sampling equipment. Care will be taken to prevent the spread of contamination. Equipment and personnel decontamination are discussed in the following sections, and the following types of equipment will be available to perform these activities:

- Scrub brushes;
- Spray rinse applicator;
- Plastic garbage bags; and
- Container of Alconox/water solution and Alconox powder.

Method of delineation/excluding non-site personnel

X	Fence
	Survey Tape
X	Traffic Cones
	Other

10.3. 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.

10.4. 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:

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

5. Thumbs down: No, negative.

10.5. Decontamination Procedures

Decontamination consists of removing outer protective Tyvek clothing and washing soiled boots and gloves using bucket and brush provided on-site in the contamination reduction zone. Inner gloves and respirator will then be removed, 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 prior to eating, drinking or leaving the Site.

Sampling equipment will be decontaminated using wet decontamination procedures:

- Wash and scrub equipment with Alconox/Liquinox and tap water solution
- Rinse with tap water
- Rinse with distilled water
- Repeat entire procedure or any parts of the procedure as necessary.

In addition to wet decontamination procedures, other measures will be taken to prevent cross contamination.

These measures include changing out disposable gloves between each sampling location, using fresh paper towels at each sample location, and maintaining a clean work area. Downhole drilling equipment will be decontaminated using a hot-water, high-pressure washer. Decontamination water will be stored on-site in 55-gallon drums.

10.6. Waste Disposal or Storage

PPE disposal (specify): Used PPE to be placed in on-site drums pending characterization and disposal.

Drill cutting/excavated sediment disposal or storage:

_____ On-site, pending analysis and further action

 X Secured (list method) 55-Gallon Drums

 X Other (describe destination, responsible parties): Stockpiling, landfill disposal (see EDR)

11.0 PERSONAL PROTECTIVE EQUIPMENT

PPE will consist of standard Level D equipment.

Air monitoring will be conducted to determine the level of respiratory protection.

- Half-face combination organic vapor/high efficiency particulate air (HEPA) or P100 cartridge respirators will be available on-site to be used as necessary. P100 cartridges are to be used only if PID measurements are below the Site action limit. P100 cartridges are used for

protection against dust, metals and asbestos, while the combination organic vapor/HEPA cartridges are protective against both dust and vapor. Ensure that the PID or TLV will detect the chemicals of concern on-site.

- Level D PPE unless a higher level of protection is required will be worn at all times on the 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.

Check applicable personal protection gear to be used:

☒	Hardhat (if overhead hazards, or client requests)
☒	Steel-toed boots (if crushing hazards are a potential or if client requests)
☒	Safety glasses (if dust, particles, or other hazards are present or client requests)
☒	Hearing protection (if it is difficult to carry on a conversation 3 feet away)
☒	Rubber boots (if wet conditions)
☒	Life Jackets (for work near/over water)

Gloves (specify):

☒	Nitrile
☒	Latex
☐	Liners
☒	Leather

Protective clothing:

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

Inhalation hazard protection:

☒	Level D
☐	Level C (respirators with organic vapor/HEPA or P100 filters)

11.1. Personal Protective Equipment Inspections

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.

11.2. Respirator Selection, Use and Maintenance

If respirators are required, Site personnel shall be trained before use on the proper use, maintenance and limitations of respirators. Additionally, they must be medically qualified to wear a respiratory protection in accordance with 29 CFR 1910.134. Site personnel who 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.

11.2.1. 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 the National Institute for Occupational Safety and Health (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.

11.2.2. Respirator Inspection and Cleaning

The Site Safety and Health Supervisor shall periodically (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.

11.2.3. Facial Hair and Corrective Lenses

Site personnel with facial hair that interferes with the sealing surface of a respirator shall not be permitted to wear respiratory protection or work in areas where respiratory protection is required. Normal eyeglasses cannot be worn under full-face respirators because the temple bars interfere

with the sealing surface of the respirator. Site personnel requiring corrective lenses will be provided with spectacle inserts designed for use with full-face respirators. Contact lenses should not be worn with respiratory protection.

12.0 ADDITIONAL ELEMENTS

12.1. Cold Stress Prevention

Working in cold environments presents many hazards to Site personnel and can result in frost nip (superficial freezing of the skin), frost bite (deep tissue freezing), or hypothermia (lowering of the core body temperature).

The combination of wind and cold temperatures increases the degree of cold stress experienced by Site personnel. Site personnel shall be trained on the signs and symptoms of cold-related illnesses, how the human body adapts to cold environments, and how to prevent the onset of cold-related illnesses. Heated break areas and warm beverages shall be provided during periods of cold weather.

12.2. Heat Stress Prevention

State and federal OSHA regulations provide specific requirements for handling employee exposure to heat stress. GeoEngineers' program complies with these requirements and will be implemented in all areas where heat stress is identified as a potential health issue.

General 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.

HEAT STRESS

Type of Clothing	Outdoor Temperature Action Levels (Degrees Fahrenheit)
Nonbreathing clothes including vapor barrier clothing or PPE such as chemical resistant suits	52°
Double-layer woven clothes including coveralls, jackets and sweatshirts	77°
All other clothing	89°

Keeping workers hydrated in a hot outdoor environment requires that 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 shall 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.

12.3. 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 Site Safety and Health Supervisor.
- Wind indicators visible to all on-site personnel should be provided by the Site Safety and Health Supervisor to indicate possible routes for upwind escape. Alternatively, the Site Safety and Health Supervisor 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 Site Safety and Health Supervisor and the injured person are to complete, within 24 hours, an Accident Report for submittal to the PM, the Health and Safety Program Manager and Human Resources. The PM should ensure that follow-up action is taken to correct the situation that caused the accident or exposure.

12.4. Personnel Medical Surveillance

GeoEngineers employees are not in a medical surveillance program because 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;
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 Members of HAZMAT teams.

12.5. 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.

12.5.1. Spill Containment Plans (Drum and Container Handling)

Drums will be fitted with secure lids to limit the potential for spills. A spill containment plan will be prepared if required by the client.

12.6. Entry Procedures for Tanks or Vaults (Confined Spaces)

GeoEngineers employees shall not enter confined spaces to perform work unless they have been properly trained and with hands-on experience in the use of 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 feet in depth with the potential for buildup of a hazardous atmosphere are considered confined spaces.

12.7. Sanitation

Washrooms are assumed to be present in on-site buildings. If necessary, portable toilets will be provided during work activities.

12.8. Lighting

Field work will be generally conducted during daylight hours; artificial lighting is not anticipated to be necessary.

12.9. Excavation, Trenching and Shoring

All employees working on project sites where there is an excavation greater than 4 feet in depth shall be trained in excavation safety and shall utilize safe procedures. OSHA designates a 5-foot depth for instituting excavation safety procedures; however GeoEngineers will use the more 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.

13.0 DOCUMENTATION TO BE COMPLETED FOR HAZWOPER PROJECTS

The following forms are required for Hazardous Waste Operations and Emergency Response (HAZWOPER) projects:

- Field Log
- Health and safety pre-entry briefing acknowledgment (Form C-1)
- Health and Safety Plan acknowledgment by GeoEngineers employees (Form C-2)
- Contractor's Health and Safety Plan Disclaimer (Form C-3)
- Conditional forms available at GeoEngineers office: Accident Report

The Field Log is to contain the following information:

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

14.0 APPROVALS

1. Plan Prepared	 Signature	July 13, 2011 Date
2. Plan Approval	 PM Signature	July 13, 2011 Date
3. Health & Safety Officer	 Health & Safety Program Manager	July 13, 2011 Date

FORM C-1
HEALTH AND SAFETY PRE-ENTRY BRIEFING
TAXIWAY F SITE, SKAGIT REGIONAL AIRPORT
FILE NO. 5364-013-03

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; and
- 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; and
- 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.

Company Employee

<u>Date</u>	<u>Topics</u>	<u>Attendee</u>	<u>Name</u>	<u>Initials</u>

FORM C-3
SUBCONTRACTOR AND SITE VISITOR SITE SAFETY FORM
Taxiway F Site, Skagit Regional Airport
File No. 5364-013-03

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.

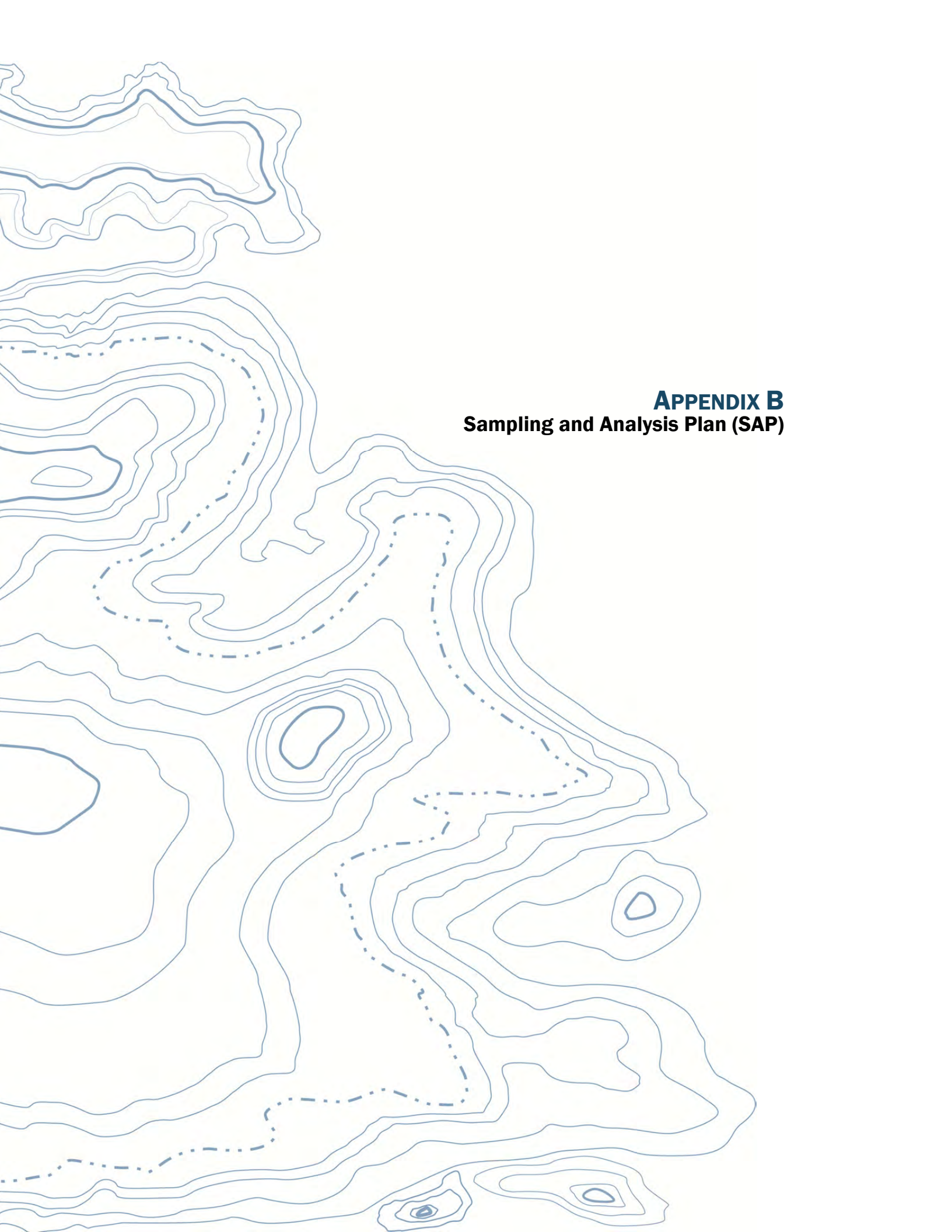
Print Name

Signature

Firm

Date

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



APPENDIX B
Sampling and Analysis Plan (SAP)

Final Sampling and Analysis Plan (SAP)

Taxiway F Site, Skagit Regional Airport
Burlington, Washington

for

**Washington State Department of Ecology
on Behalf of Port of Skagit County**

July 13, 2011



Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, Washington 98101
206.728.2674



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1.0 INTRODUCTION

GeoEngineers, Inc. (GeoEngineers) is pleased to present this Sampling and Analysis Plan (SAP) for cleanup activities at the Port of Skagit County's (Port's) Taxiway F Site (Site) located 3200 feet east of Farm to Market Road and 600 feet south of Bayview Road on the western side of the Skagit Regional Airport in Burlington, Washington. This SAP serves as the primary guide for standard operating procedures for field verification soil and groundwater sampling activities that will be completed during the cleanup action.

The Cleanup Action at the Site is being conducted by the Port to satisfy requirements of a Consent Decree (No. TBD) issued for the Site by the Washington State Department of Ecology (Ecology) to address contamination resulting from releases of pesticides and herbicides stored at the Site. The objectives of the cleanup action are presented in the Engineering Design Report (GeoEngineers, 2011a). Project quality assurance and quality control for field activities are discussed in the Quality Assurance Project Plan (QAPP) presented in Appendix C of the Compliance Monitoring Plan (CMP; GeoEngineers, 2011b). A Site-specific Health and Safety Plan (HASP) will be used for field activities and is presented in Appendix A of the CMP (GeoEngineers, 2011b).

This SAP is not applicable for stormwater sampling activities, which will be conducted by the Contractor. The Contractor will be responsible for developing their own sampling and analysis procedures for stormwater sampling.

2.0 BACKGROUND

2.1. Problem Definition

Historical activities at the Site have included the storage of pesticides and herbicides in the hangar building and loading of these chemicals onto aircraft for use. Previous environmental investigations conducted at the Site by the Port after discolored soil in the vicinity of the hangar building was discovered. The results of site investigations indicated the presence of pesticides and herbicides in soil and groundwater at concentrations of regulatory significance. Investigations conducted prior to 2009 are summarized in the RI/FS Work Plan (GeoEngineers, 2009). The RI/FS Report (GeoEngineers 2011c) presents the results of the RI sampling activities conducted in 2009 and 2010, and uses the results of the RI and earlier investigations to characterize the nature and extent of contamination.

Cleanup activities at the Site are being conducted to remove pesticide and herbicide contaminated soil from the Site. Verification samples will be obtained during cleanup activities to confirm the completeness of the contaminated soil removal. Confirmational groundwater monitoring will be performed after the Site cleanup action is completed to evaluate the post-construction effectiveness of the cleanup action.

2.2. Site Description

The Taxiway F Site is generally located 3,200 feet east of Farm to Market Road and 600 feet south of Bayview Road on the western side of the Skagit Regional Airport in Burlington, Washington. The

Site is currently owned by the Port and is located on property classified by Skagit County as Aviation Related (AVR) zoning. The Port currently uses the hangar building for storage of maintenance equipment. The Port has no plans to rezone the property, and does not anticipate any future changes to the current land use (light industrial).

2.3. Site History

In 1933, a single runway was constructed for light airplanes. This original runway would later become Taxiway F. In 1943 the U.S. Navy constructed the airport's current two-runway system as an alternate training field for the Whidbey Island Naval Air Station. After World War II, the federal government continued to operate the airport, primarily for the Civil Air Patrol, until transferring the facility to Skagit County in 1958. In 1965 the airport was conveyed to the joint ownership of Port of Anacortes and Port of Skagit County. The Port assumed full ownership and operation of the airport in 1975. Prior to 1978, the Site and the surrounding property were used for cattle grazing and farm equipment storage by Ray Jensen, John Petter, and Peth and Sons.

Between 1978 and 2000, the Port leased the portion of the Site immediately adjacent to the taxiway to a series of individuals and companies engaged in the business of crop dusting. In 1978, the Port leased the property to Swanland-Karr, Inc. for crop dusting operations. In 1982, Swanland-Karr, Inc. proposed to construct the hangar building that currently exists at the Site for aircraft parking and materials storage, including storage of chemicals used for crop dusting. William Swanland and Swanland-Belisle, Inc. leased the property in 1985; pesticide products used by the lessee were reported in 1988 to include Dinoseb, Parathion, Thiodon, Chemho-IPC, and Simazon. Environmental review of the leased property performed in 1988 by the Port identified staining in some of the work areas and an apparent oil release on the property. The Port provided the results of the environmental review and suggestions for addressing the identified issues to the lessee. In 1992, the lease was assigned to Belisle Bros. Crop-Dusting, Inc. for continued use for crop dusting activities. In 1993, the lease of the Site property was assigned to Curt Tronsdal and Tronsdal Air Service, Inc. In 1998, the lease of the Site property was assigned to Skagit Ag Services, Inc., which leased the property until the Port discontinued leasing the property in 2000.

2.4. Project Description and Schedule

Cleanup Activities consists of excavation and off-site disposal of soil containing constituents of concern (COC) concentrations above MTCA cleanup levels. The objective of the cleanup action is to eliminate, reduce, or otherwise control to the extent feasible and practicable, unacceptable risks to human health and the environment posed by pesticides and herbicides in soil and groundwater at the Site in accordance with MTCA (WAC 173-340) and other applicable regulatory requirements.

Selected soil samples obtained from the limits of excavation will be submitted to OnSite Environmental, Inc. in Redmond, Washington for chemical analysis of total endosulfan (indicator hazardous substances for soil established by the Cleanup Action Plan (CAP) for the Site; GeoEngineers, 2011d) using EPA method 8081A-GC/ECD.

Selected groundwater samples obtained from shallow monitoring wells will be submitted to OnSite Environmental, Inc. for chemical analysis of dinoseb, bentazon, 2,4-dichlorophenoxyacetic acid [2,4-D], 2-methyl-4-chlorophenoxy-acetic acid [MCPA], aldrin, dieldrin, heptachlor, and heptachlor

epoxide (indicator hazardous substances for groundwater established by the CAP for the Site; GeoEngineers, 2011d) using EPA method 8081A-GC/ECD.

Pending permit approvals, cleanup-related construction work is scheduled to begin within 30 days of Ecology approval of the Final Engineering Design Report (GeoEngineers, 2011a) and estimated to occur over a period of 3 to 4 months beginning in August 2011.

3.0 SAMPLING PROCEDURES

Sampling activities at Site will consist primarily of the following:

- Obtain verification soil sample from the remedial excavation for chemical analysis of endosulfans (endosulfan I, endosulfan II, and endosulfan sulfate).
- Install post-construction groundwater monitoring wells and obtain water samples for chemical analysis of dinoseb, bentazon, 2,4-D, MCPA, aldrin, dieldrin, heptachlor, and heptachlor epoxide.

The following sections describe the field sampling procedures that will be used during the Cleanup Action.

3.1. Soil Verification Sampling

Soil verification samples will be collected by GeoEngineers field personnel from the base and/or sidewalls of the remedial excavation to confirm the completeness of the contamination removal. Verification sample procedures and sample frequencies are described in the CMP (GeoEngineers, 2011b). An example confirmatory sampling grid is shown on Figure 3 of the CMP (GeoEngineers, 2011b). Soil samples will be collected using a clean stainless steel spoon/trowel or directly by hand using a fresh and clean pair of nitrile gloves either from the excavation equipment (i.e., backhoe or excavator) or from the excavated surfaces. Samples obtained from backhoe or excavator buckets will be from the center of the bucket or from an area of soil that the surface of the bucket has not touched. Collected samples will be transferred into clean sample containers provided by the analytical laboratory. Sampling equipment (if used) will be decontaminated prior to sample collection at each location. Decontamination procedures are described in the QAPP (Appendix C of the CMP). Each sample container will be securely capped, labeled, and placed in a cooler with ice immediately upon collection as described in the QAPP (Appendix C of the CMP).

Each sample will be designated with a unique, sequential sample identification number. The field representative will visually classify the soils in accordance with American Society for Testing and Materials (ASTM) Method D 2488 and record soil descriptions and other relevant field screening details (e.g., staining, debris, odors, etc.) in the field log. Field screening procedures are presented in Section 3.3.

Soil samples will be submitted to an Ecology-certified laboratory for analysis of soil indicator hazard substance - endosulfans (endosulfan I, endosulfan II, and endosulfan sulfate). Analytical detections will be confirmed by mass spectrometry to reduce the potential for false positive results.

3.2. Groundwater Monitoring

Following the completion of Cleanup Action, groundwater samples will be obtained from the Site to evaluate the long-term effectiveness of the cleanup action. The CAP established that the monitoring wells (GEI-MW4, GEI-MW6, GEI-MW7 and GEI-MW8) located within the limits of remedial excavation will be decommissioned and removed during the Cleanup Action and will be replaced following the completion of Cleanup Action for the purpose of evaluating post-construction shallow (perched) groundwater conditions. The location of the replacement wells are shown on Figure 4 of the CMP (GeoEngineers, 2011b).

3.2.1. Monitoring Well Construction

Drilling and construction of the monitoring wells will be conducted by a Washington State licensed driller in accordance with the Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC). Installation of the monitoring wells will be observed by a GeoEngineers representative, who will maintain a detailed log of the materials and depths of the wells. Monitoring well borings will be drilled using a limited access, track mounted hollow-stem auger rig or similar equipment. The monitoring wells are anticipated to be installed to depths of approximately 5 feet bgs. Soil cuttings from borings completed for the monitoring well installation will be placed in labeled and sealed 55-gallon drums. The drums will be stored temporarily at a secure location on Port property pending receipt of analytical results and off-site disposal at a permitted facility.

Wells will be constructed of 2-inch-diameter, flush-threaded, Schedule 40 polyvinyl chloride (PVC) casing with machine-slotted PVC screen (0.010-inch). The top of the well screens will be located at a depth of approximately 2 feet below ground surface (bgs). Screened intervals of approximately 3-feet length are anticipated.

Following placement of the well screen and casing in the borehole, a filter pack will be installed around the well screen. The filter pack will extend from the bottom of the well to approximately the top of the well screen. It is anticipated that filter pack material will consist of commercially prepared 10-20 silica sand; however, an alternate sand size/gradation may be used to minimize the turbidity of water entering the wells.

A bentonite annular seal at least 1 foot thick will be placed above the sand pack to a depth of about 1 foot bgs. Each well will be completed with a concrete surface seal, and either a flush-mount or above-ground steel or aluminum monument. The monument will be cemented in place from the surface to a depth of about 1 foot bgs.

3.2.2. Monitoring Well Development

Each monitoring well will be developed to remove water introduced into the well during drilling (if any), stabilize the filter pack and formation materials surrounding the well screen, and restore the hydraulic connection between the well screen and the surrounding soil. The well screen interval will be gently surged with a decontaminated bailer or surge block, and the well will be purged of water. Development will continue until a minimum of five casing volumes of water have been removed and turbidity of the purge water is relatively low. The removal rate and volume of groundwater removed will be recorded during well development. Water that is removed from the

well during well development activities will be stored on-site in labeled 55-gallon drums, pending off-site disposal. Depths to water in the monitoring wells will be measured prior to and following development.

3.2.3. Water Level Measurements

Water level measurements will be obtained at each monitoring well prior to purging and sample collection. All water levels will be measured using an electronic water level indicator and will be recorded to the nearest 0.01 foot. Measurements will be taken from the top of the well casing.

3.2.4. Groundwater Sampling

Groundwater samples will be obtained by GeoEngineers field personnel using low-flow/low-turbidity sampling techniques to minimize the suspension of sediment in the samples. The wells will be purged and groundwater samples will be obtained from the wells using a peristaltic or submersible pump and disposable polyethylene tubing. Groundwater will be purged from the wells at a rate of approximately 0.5 liters per minute. A Horiba U-22 (or similar) water quality measuring system with a flow-through cell will be used to monitor the following water quality parameters during purging: electrical conductivity, dissolved oxygen, pH, salinity, total dissolved solids, turbidity, oxidation-reduction potential, and/or temperature. Samples will be collected from the wells after these parameters vary by less than 10 percent on three consecutive measurements. The stabilized field measurements will be documented in the field log.

Following well purging, the flow-through cell will be disconnected and groundwater samples will be collected in laboratory-prepared containers. Both field-filtered and unfiltered samples of shallow groundwater will be collected from the new and existing shallow monitoring wells and submitted to an Ecology-certified laboratory for analyses of the perched groundwater indication hazard substances - dinoseb, bentazon, 2,4-D, MCPA, aldrin, dieldrin, heptachlor, and heptachlor epoxide. Analytical detections will be confirmed by mass spectrometry to reduce the potential for false positive results.

The samples will be placed into a cooler with ice and logged on the chain-of-custody form using procedures described below. Purge water removed from the monitoring wells and decontamination water generated during all sampling activities will be stored on Site in labeled and sealed 55-gallon drums. The drums will be stored temporarily at a secure location on Port property pending receipt of analytical results and off-site disposal at a permitted facility.

3.2.5. Surveying

Existing permanent or temporary benchmarks will be used to determine the elevation of monitoring wells to be installed following the Cleanup Action.

3.2.5.1 VERTICAL CONTROLS

Each monitoring well casing rim and ground surface elevation will be surveyed by GeoEngineers or subcontractor personnel relative to the temporary or permanent benchmark. Elevations will be surveyed using a laser level or similar equipment, which has an accuracy of 0.01 feet. The vertical datum for the Site will be derived from running levels to the US Engineers Office Survey Marker Disk set in concrete 79 feet north of the projected centerline of the hanger access ramp (National Geodetic Survey designation – P Pot TXY 3 [PID – TR0222]; NAVD 88 – Elevation 123.97 feet).

3.2.5.2 HORIZONTAL CONTROLS

GeoEngineers field personnel will record the boring/monitoring well sampling locations, and other pertinent information, using hand-held Trimble GeoXT or similar global positioning system (GPS) units. GPS data collected in the field will be processed in the office using measurements from the nearest reference station to each collection point. The horizontal survey data will be referenced to the Washington State Plane North Coordinate System (NAD83).

3.3. Field Screening

The potential presence of contamination in soil samples will be evaluated using field screening method of visual screening. The soil will be observed for any physical evidence of indicative of possible contamination including unusual color, staining and/or odor. 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.

3.4. Decontamination

Drilling and non-disposable sampling equipment will be decontaminated using the procedures described in the QAPP (Appendix C of the CMP).

3.5. Sample Handling

Sample handling procedures, including labeling, container and preservation requirements and holding times are described in QAPP (Appendix C of the CMP).

3.6. Disposal of Investigation-Derived Materials

3.6.1. Soil

Soil cuttings from borings completed during the post construction groundwater monitoring well installation will be placed in labeled and sealed 55-gallon drums. The drums will be temporarily stored on Site at a secure location pending receipt of analytical results and off-site disposal at a permitted facility. Each drum will be labeled with the following information:

- Material/media (i.e., soil, water, etc.) contained in the drum;
- Source of the material in the drum (i.e., investigation locations and depths where appropriate);
- Date material was generated; and
- Name and telephone number of GeoEngineers contact person.

3.6.2. Groundwater and Decontamination Water

Development and purge water removed from the monitoring wells and decontamination water generated during all sampling activities will be placed in labeled and sealed 55-gallon drums. The drums will be temporarily stored on Site at a secure location pending receipt of analytical results and off-site disposal at a permitted facility. Each drum will be labeled with the following information:

- Material/media (i.e., soil, water, etc.) contained in the drum;
- Source of the material in the drum (i.e., investigation locations and depths where appropriate);

- Date material was generated; and
- Name and telephone number of GeoEngineers contact person.

3.6.3. Disposition of Incidental Waste

Incidental waste generated during sampling activities includes items such as gloves, plastic sheeting, sample tubing, paper towels and similar expended and discarded field supplies. These materials are considered *de minimis* (Ecology, 2006) and will be disposed of in a local trash receptacle or county disposal facility.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

Quality assurance/quality control (QA/QC) procedures and standards that will be implemented during Cleanup Action activities are presented in the QAPP (Appendix C of the CMP). The purpose of this document is to describe analysis and quality control procedures that will be implemented to produce chemical and field data that are representative, valid and accurate for use in evaluating the cleanup action alternatives.

5.0 REFERENCES

GeoEngineers, Inc., "Final Work Plan, Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158." GEI File No. 5364-013-00, dated July 31, 2009.

GeoEngineers, Inc. (2011a), "Engineering Design Report, Taxiway F Site, Skagit Regional Airport, Burlington, Washington." GEI File No. 5364-013-03, dated July 15, 2011.

GeoEngineers, Inc. (2011b), "Compliance Monitoring Plan, Taxiway F Site, Skagit Regional Airport, Burlington, Washington." GEI File No. 5364-013-03, dated July 15, 2011.

GeoEngineers, Inc. (2011c), "Draft Final Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158." GEI File No. 5364-013-02, dated January 10, 2011.

GeoEngineers, Inc. (2011d), "Draft Cleanup Action Plan, Taxiway F Site, Skagit Regional Airport." GEI File No. 5364-013-03, dated February 28, 2011.

Washington State Department of Ecology (Ecology), "Minimum Standards for Construction and Maintenance of Wells", Chapter 173-160 WAC, update November 2006.

A background topographic map with blue contour lines of varying thicknesses. Some lines are solid, while others are dashed or dotted, indicating different levels or features. The map is oriented with the top of the page as the top of the map.

APPENDIX C

Quality Assurance Project Plan (QAPP)

**Final Quality Assurance Project
Plan (QAPP)**

Taxiway F Site, Port of Skagit County
Burlington, Washington

for

**Washington State Department of Ecology
on Behalf of Port of Skagit**

July 13, 2011



Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, Washington 98101
206.728.2674



**Final Quality Assurance Project
Plan (QAPP)
Taxiway F Site, Port of Skagit County
Burlington, Washington**

Project No. 5364-013-03

July 13, 2011

Approved By:

Signature:  Date: 7/27/2011

John M. Herzog, PhD, Principal, GeoEngineers, Inc.

Signature:  Date: 7/27/2011

Robert S. Trahan, Field Coordinator, GeoEngineers, Inc.

Signature:  Date: 7/27/2011

Mark J. Lybeer, Quality Assurance Leader, GeoEngineers, Inc.

AJ:RST:JMH:mlh:csv

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1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared for sampling and compliance monitoring activities Port of Skagit County's (Port's) Taxiway F Site (Site) located 3200 feet east of Farm to Market Road and 600 feet south of Bayview Road on the western side of the Skagit Regional Airport in Burlington, Washington. This QAPP serves as the primary guide for the integration of quality assurance (QA) and quality control (QC) functions into the Cleanup Action sampling and analysis activities. The QAPP presents the objectives, procedures, organization, and specific quality assurance and quality control activities designed to achieve data quality goals established for the project. Environmental measurements will be conducted to produce data that are scientifically valid, of known and acceptable quality and that meet established objectives. QA/QC procedures will be implemented so that the precision, accuracy, representativeness, completeness and comparability (PARCC) of the data generated meet the specified data quality objectives.

The Cleanup Action at the Site is being conducted by the Port to satisfy requirements of a Consent Decree (No. TBD) issued for the Site by the Washington State Department of Ecology (Ecology) to address contamination resulting from releases of pesticides and herbicides stored at the Site. The objectives of the cleanup action are presented in the Engineering Design Report (GeoEngineers, 2011a). Sampling procedures are outlined in the Sampling and Analysis Plan (SAP) included as Appendix B of the Compliance Monitoring Plan (GeoEngineers, 2011b). A Site-specific Health and Safety Plan (HASP) will be used for field activities and is presented in Appendix C of the Compliance Monitoring Work Plan.

This QAPP is not applicable for permit-required stormwater sampling activities, which will be performed by the Contractor. For that purpose Contractor will be responsible for developing their own QAPP, as part of the project Technical Specification requirements.

2.0 BACKGROUND

2.1. Problem Definition

Historical activities at the Site have included the storage of pesticides and herbicides in the hangar building and loading of these chemicals onto aircraft for use. Previous environmental investigations conducted at the Site by the Port after discolored soil in the vicinity of the hangar building was discovered. The results of site investigations indicated the presence of pesticides and herbicides in soil and groundwater at concentrations of regulatory significance. Investigations conducted prior to 2009 are summarized in the RI/FS Work Plan (GeoEngineers, 2009). The RI/FS Report (GeoEngineers 2011c) presents the results of the RI sampling activities conducted in 2009 and 2010, and uses the results of the RI and earlier investigations to characterize the nature and extent of contamination.

Cleanup activities at the Site are being conducted to remove pesticide and herbicide contaminated soil from the Site. Verification samples will be obtained during cleanup activities to confirm the completeness of the contaminated soil removal. Confirmational groundwater monitoring will be

performed after the Site cleanup action is completed to evaluate the post-construction effectiveness of the cleanup action.

2.2. Site Description

The Taxiway F Site is generally located 3,200 feet east of Farm to Market Road and 600 feet south of Bayview Road on the western side of the Skagit Regional Airport in Burlington, Washington. The Site is currently owned by the Port and is located on property classified by Skagit County as Aviation Related (AVR) zoning. The Port currently uses the hangar building for storage of maintenance equipment. The Port has no plans to rezone the property, and does not anticipate any future changes to the current land use (light industrial).

2.3. Site History

In 1933, a single runway was constructed for light airplanes. This original runway would later become Taxiway F. In 1943 the U.S. Navy constructed the airport's current two-runway system as an alternate training field for the Whidbey Island Naval Air Station. After World War II, the federal government continued to operate the airport, primarily for the Civil Air Patrol, until transferring the facility to Skagit County in 1958. In 1965 the airport was conveyed to the joint ownership of Port of Anacortes and Port of Skagit County. The Port assumed full ownership and operation of the airport in 1975. Prior to 1978, the Site and the surrounding property were used for cattle grazing and farm equipment storage by Ray Jensen, John Petter, and Peth and Sons.

Between 1978 and 2000, the Port leased the portion of the Site immediately adjacent to the taxiway to a series of individuals and companies engaged in the business of crop dusting. In 1978, the Port leased the property to Swanland-Karr, Inc. for crop dusting operations. In 1982, Swanland-Karr, Inc. proposed to construct the hangar building that currently exists at the Site for aircraft parking and materials storage, including storage of chemicals used for crop dusting. William Swanland and Swanland-Belisle, Inc. leased the property in 1985; pesticide products used by the lessee were reported in 1988 to include Dinoseb, Parathion, Thiodon, Chemho-IPC, and Simazon. Environmental review of the leased property performed in 1988 by the Port identified staining in some of the work areas and an apparent oil release on the property. The Port provided the results of the environmental review and suggestions for addressing the identified issues to the lessee. In 1992, the lease was assigned to Belisle Bros. Crop-Dusting, Inc. for continued use for crop dusting activities. In 1993, the lease of the Site property was assigned to Curt Tronsdal and Tronsdal Air Service, Inc. In 1998, the lease of the Site property was assigned to Skagit Ag Services, Inc., which leased the property until the Port discontinued leasing the property in 2000.

2.4. Project Description and Schedule

Cleanup Activities consists of excavation and off-site disposal of soil containing constituents of concern (COC) concentrations above MTCA cleanup levels. The objective of the cleanup action is to eliminate, reduce, or otherwise control to the extent feasible and practicable, unacceptable risks to human health and the environment posed by pesticides and herbicides in soil and groundwater at the Site in accordance with MTCA (WAC 173-340) and other applicable regulatory requirements.

Selected soil samples obtained from the limits of excavation will be submitted to OnSite Environmental, Inc. (OnSite) in Redmond, Washington for chemical analysis of total endosulfan

(indicator hazardous substances for soil established by the Cleanup Action Plan (CAP) for the Site; GeoEngineers, 2011d) using EPA method 8081A-GC/ECD.

Selected groundwater samples obtained from shallow monitoring wells will be submitted to OnSite for chemical analysis of dinoseb, bentazon, 2,4-dichlorophenoxyacetic acid [2,4-D], 2-methyl-4-chlorophenoxy-acetic acid [MCPA], aldrin, dieldrin, heptachlor, and heptachlor epoxide (indicator hazardous substances for groundwater established by the CAP for the Site; GeoEngineers, 2011d) using EPA method 8081A-GC/ECD.

Pending permit approvals, cleanup-related construction work is scheduled to begin within 30 days of Ecology approval of the Final Engineering Design Report (GeoEngineers, 2011a) and estimated to occur over a period of 3 to 4 months beginning in August 2011.

3.0 PROJECT MANAGEMENT

3.1. Project Organization and Responsibilities

Descriptions of the responsibilities, lines of authority and communication for the key positions providing quality assurance and quality control are shown in Figure 2-1. The project organization facilitates the efficient production of project work, allows for an independent quality review, and permits resolution of any QA issues.

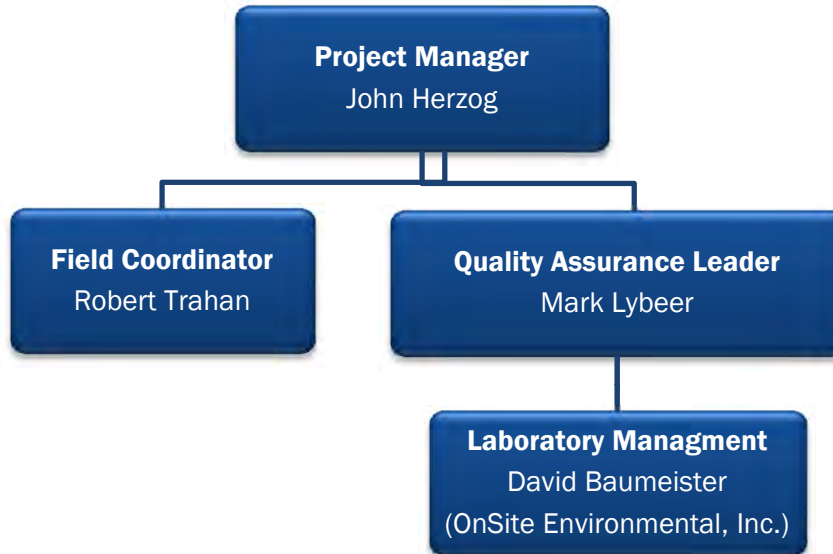


Figure 2-1. Project Organization Chart

3.1.1. Project Manager

John Herzog is the Project Manager and can be reached at 206-406-6431. The Project Manager has overall responsibility for executing the project in accordance with contractual requirements. The Project Manager is also 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.

3.1.2. Field Coordinator

Robert Trahan is the Field Coordinator and can be reached at 206-239-3253. 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.

3.1.3. Quality Assurance Leader

Mark Lybeer is the QA Leader and can be reached at 206-239-3227. 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.

3.1.4. Laboratory Management

OnSite will provide laboratory analytical services for the project. David Baumeister is the Laboratory's QA Coordinator for the project and can be reached at 425-883-3881.

The subcontracted laboratories conducting sample analyses for this project are required to obtain approval from the QA Leader before the initiation of 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 QC. Specific responsibilities of this position include:

- Ensure implementation of the QA Plan.
- Serve as the laboratory point of contact.
- Activate corrective action for out-of-control events.
- Issue the final QA/QC report.
- Administer QA sample analysis.
- Comply with the specifications established in the project plans as related to laboratory services.
- Participate in QA audits and compliance inspections.

3.2. Health and Safety

A Site-specific health and safety plan (HASP) will be used for Cleanup Action field activities and is presented in Appendix A of the CMP. 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 the completion of field activities.

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

4.0 DATA QUALITY OBJECTIVES

The quality assurance objective for technical data is to collect environmental monitoring data of known, acceptable, and documentable quality. The QA 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 that will facilitate consistency and thoroughness of data generated.
- Achieve the acceptable level of confidence and quality required so that data generated are scientifically valid and of known and documented quality. This will be performed by establishing criteria for precision, accuracy, representativeness, completeness, and comparability, and by testing data against these criteria.

The sampling design, field procedures, laboratory procedures, and QC procedures are set up to provide high-quality data for use in this project. Specific data quality factors that may affect data

usability include quantitative factors (bias, detection limits, precision, accuracy and completeness) and qualitative factors (representativeness and comparability). The measurement quality objectives (MQO) associated with the data quality factors are summarized in Table C-1 and are discussed below.

4.1. Detection Limits

Analytical methods have quantitative limitations at a given statistical level of confidence that are often expressed as the method detection limit (MDL). Although results reported near the MDL provide insight to Site conditions, quality assurance dictates that analytical methods achieve a consistently reliable level of detection known as the practical quantitation limit (PQL), which is typically demonstrated with the lowest point of a linear calibration. The contract laboratory will provide numerical results for all analytes and report them as detected above the PQL or undetected at the PQL.

The reporting limits for Site Chemicals of Potential Concern (COPCs) are presented in Table C-2 for soil and Table C-3 for groundwater. These reporting limits were obtained from an Ecology-certified laboratory (OnSite). The reporting limits presented in Tables C-2 and C-3 are the laboratory PQLs that are considered target reporting limits (TRLs) because several factors may influence final reporting limits. First, moisture and other physical conditions of soil affect detection limits. 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 is that other analytes could be reported as undetected but at a value higher than a specified TRL. Data users must be aware that high non-detect values, although correctly reported, can bias statistical summaries and careful interpretation is required to correctly characterize Site conditions.

4.2. 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 (matrix spike duplicates). The closer the measured values are to each other, the more precise the measurement process. Precision error may affect data usefulness. Good precision is indicative of relative consistency and comparability between different samples. Precision will be expressed as the relative percent difference (RPD) for spike sample comparisons of various matrices and field duplicate comparisons for soil and catch basin solids and water samples.

This value is calculated by:

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

D_1 = Concentration of analyte in sample.

D_2 = Concentration of analyte in duplicate sample.

The calculation applies to split samples, replicate analyses, duplicate spiked environmental samples (matrix spike duplicates), and laboratory control duplicates. The RPD will be calculated for samples and compared to the applicable criteria. Precision can also be expressed as the percent difference (%D) between replicate analyses. Persons performing the evaluation must review one or more pertinent documents (USEPA, 1999; USEPA, 2004) that address criteria exceedances and courses of action. Project RPD goals for all analyses are 35 percent for water samples and 50 percent for soil and catch basin solids 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.

4.3. Accuracy

Accuracy is a measure of bias in the analytic process. The closer the measurement value is to the true value, the greater the accuracy. This measure is defined as the difference between the reported values versus the actual value and is often measured with the addition of a known compound to a sample. The amount of known compound reported in the sample, or percent recovery, assists in determining the performance of the analytical system in correctly quantifying the compounds of interest. Since most environmental data collected represent one point spatially and temporally rather than an average of values, accuracy plays a greater role than precision in assessing the results. In general, if the percent recovery is low, non-detect results may indicate that compounds of interest are not present when in fact these compounds are present. Detected compounds may be biased low or reported at a value less than actual environmental conditions. The reverse is true when recoveries are high. Non-detect values are considered accurate while detected results may be higher than the true value.

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:

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

Persons performing the evaluation must review one or more pertinent documents (USEPA, 1999; USEPA, 2004) that address criteria exceedances and courses of action. Accuracy criteria for surrogate spikes, matrix spikes, and laboratory control spikes are found in Table C-1 of this QAPP.

4.4. Representativeness

Representativeness expresses the degree to which data accurately and precisely represent the actual Site conditions. The determination of the representativeness of the data will be performed by completing the following:

- Comparing actual sampling procedures to those delineated within the SAP and this QAPP.
- Comparing analytical results of field duplicates to determine the variations 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.

4.5. Completeness

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. Completeness goals are 90 percent useable data for samples/analyses planned. If the completeness goal is not achieved an evaluation will be made to determine if the data are adequate to meet study objectives.

$$\text{Completeness} = \frac{\text{number of valid measurements}}{\text{total number of data points planned}} \times 100$$

4.6. Comparability

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 determine overall usefulness of data sets, following the determination of both precision and accuracy.

4.7. 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-4.

4.8. 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 and travel with samples from the laboratory to the field and back to the laboratory. 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* (USEPA, 1999) and professional judgment.

4.9. Special Training Requirements/Certification

The Superfund Amendments and Reauthorization Act of 1986 required the Secretary of Labor to issue regulations providing health and safety standards and guidelines for workers engaged in hazardous waste operations. Occupational Safety and Health Administration (OSHA) regulations (29 CFR 1910.120) require training to provide employees with the knowledge and skills necessary to enable them to perform their jobs safely and with minimum risk to their personal health. All sampling personnel will have completed the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and 8-hour refresher courses, as necessary, to meet OSHA regulations.

5.0 DOCUMENTATION AND RECORDS

5.1. Field observations

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, catch basin solids, 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., lithology, field screening results)
- 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.

5.2. Analytical chemistry records

Laboratories will be responsible for internal checks on data reporting and will correct errors identified during the QA review. All laboratories must be accredited by Ecology for the required analytical methods. Close contact will be maintained with the laboratories to resolve any quality control problems in a timely manner. The laboratories will be required to provide the following:

- **Project narrative** – This summary, in the form of a cover letter, will present any problems encountered during any aspect of analysis. The summary will include, but not be limited to, a discussion of QC, sample shipment, sample storage, and analytical difficulties. Any problems encountered by the laboratory, and their resolutions, will be documented in the project narrative.
- **Records** – Legible copies of the chain-of-custody (COC) forms will be provided as part of the data package. This documentation will include the time of receipt and the condition of each sample received by the laboratory. Additional internal tracking of sample custody by the laboratory will also be documented.
- **Sample results** – The data package will summarize the results for each sample analyzed. The summary will include the following information, as applicable:
 - Field sample identification code and the corresponding laboratory identification code

- Sample matrix
 - Date of sample extraction/digestion
 - Date and time of analysis
 - Weight and/or volume used for analysis
 - Final dilution volumes or concentration factor for the sample
 - Total solids in the samples
 - Identification of the instruments used for analysis
 - MDLs and RLs
 - All data qualifiers and their definitions
- **QA/QC summaries** – These summaries will contain the results of all QA/QC procedures. Each QA/QC sample analysis will be documented with the same information as that required for the sample results (see above). The laboratory will make no recovery or blank corrections. The required summaries are listed below.
- The calibration data summary will contain the concentrations of the initial calibration and daily calibration standards and the date and time of analysis. The response factor, percent standard deviation (%RSD), RPDs, and retention time for each analyte will be listed, as appropriate. Results for standards analyzed at the RL to determine instrument sensitivity will be reported.
 - The internal standard area summary will report the internal standard areas, as appropriate.
 - The method blank analysis summary will report the method blank analysis associated with each sample and the concentrations of all compounds of interest identified in these blanks.
 - The surrogate spike recovery summary will report all surrogate spike recovery data for organic analyses. The names and concentrations of all compounds added, percent recoveries, and QC limits will be listed.
 - The matrix spike (MS) recovery summary will report the MS or MS duplicate (MSD) recovery data for analyses, as appropriate. The names and concentrations of all compounds added, percent recoveries, and QC limits will be included in the data package. The RPD for all MS/MSD analyses will be reported.
 - The laboratory replicate summary will report the RPD for all laboratory replicate analyses. The QC limits for each compound or analyte will be listed.
 - The laboratory control sample (LCS) analysis summary will report the results of the analyses of the LCS. The QC limits for each compound or analyte will be included in the data package.
 - The relative retention time summary will report the relative retention times for the primary and confirmational columns of each analyte detected in the samples, as appropriate.

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.

5.3. Data reduction

Data reduction is the process by which original data are converted or reduced to a specified format or unit to facilitate the analysis of the data. For example, a final analytical concentration may need to be calculated from a diluted sample result. Data reduction requires that all aspects of sample preparation that could affect the test result, such as sample volume analyzed or dilutions required, be taken into account in the final result. The laboratory personnel will reduce the analytical data for review by the Quality Assurance Leader and Project Manager.

During chemical analysis, samples are occasionally diluted after the initial analysis if the estimated concentration curve for one or more of the target analytes is above the calibration curve. In these instances, concentrations from the initial analysis will be identified as the "best result" for all target analytes other than the chemical(s) that was originally above the calibration range. The "best result" for this qualified analyte(s) will be taken from the diluted sample.

6.0 DATA GENERATION AND ACQUISITION

6.1. Sample Process Design

As required Ecology's Cleanup Action Plan (CAP; GeoEngineers 2011d), samples of soil and groundwater will be collected during the Cleanup Action activities. Soil and groundwater sampling will be conducted by GeoEngineers' field personnel. Table C-2 and C-3 summarizes the chemical analyses to be performed for soil samples and groundwater samples respectively. The CAP specifies the following chemical analyses for the project:

- Chemical Analyses to be performed on soil samples include endosulfans (endosulfan I, endosulfan II, endosulfan sulfate, and total endosulfans).
- Chemical Analyses to be performed on groundwater samples include aldrin, dieldrin, heptachlor, heptachlor epoxide, dinoseb, MCPA, 2,4-D and bentazon.

6.1.1. Soil Verification Sampling

Soil verification samples will be collected by GeoEngineers' field personnel from the base and/or sidewalls of the remedial excavation to confirm the completeness of the contamination removal. Verification sample procedures and sample frequencies are described in the CMP (GeoEngineers, 2011b). An example confirmatory sampling grid is shown on Figure 3 of the Compliance Monitoring Plan (GeoEngineers, 2011b).

6.1.2. Groundwater Monitoring

Following the completion of Cleanup Action, groundwater samples will be obtained from the Site to evaluate the long-term effectiveness of the cleanup action. The CAP established that the monitoring wells (GEI-MW4, GEI-MW6, GEI-MW7 and GEI-MW8) located within the limits of remedial excavation will be decommissioned and removed during the Cleanup Action and will be replaced

following the completion of Cleanup Action for the purpose of evaluating post-construction shallow (perched) groundwater conditions. The location of the replacement wells are shown on Figure 4 of the CMP (GeoEngineers, 2011b).

6.2. Sample Methods

6.2.1. Sampling Equipment and Decontamination Procedures

Soil samples will be collected using coring/drilling equipment (i.e., hollow stem auger and/or direct push), excavation equipment (i.e., backhoe or excavator), and hand tools including stainless steel spoons and stainless steel mixing bowls. Groundwater samples will be collected from monitoring wells using submersible or peristaltic pumps and low-flow sampling procedures.

Reusable sampling equipment that comes in contact with soil, catch basin solids or groundwater will be decontaminated before each use. Decontamination procedures for this equipment will consist of the following:

1. Washing with a brush and non-phosphate detergent solution (e.g., Liqui-Nox and distilled water),
2. Rinsing with distilled water, and
3. Wrapping or covering the decontaminated equipment with aluminum foil. Field personnel will limit cross-contamination by changing gloves between sampling locations.

Drilling equipment (auger, soil sampler, direct push barrel) which comes into contact with soil will be decontaminated before each use. Decontamination procedures for this equipment will consist of the following:

1. Washing with pressurized hot-water,
2. Wash with brush and non-phosphate detergent solution, and
3. Rinse with potable water.

Wash water used to decontaminate the reusable sampling equipment will be collected and stored on-site in 55-gallon drums.

6.2.2. 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. Visual screening methods consisting of observations for unusual color and/or staining indicative of possible contamination will be used during the Cleanup Action.

6.2.3. Sample Containers and Labeling

The Field Coordinator will establish field protocol to manage field sample collection, handling, and documentation. Soil, catch basin solids and groundwater samples will be placed in appropriate laboratory-prepared containers. Sample containers and preservatives are listed in Table C-4.

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 sample containers/labels, field log books, and chain-of-custody (COC) forms.

6.3. Sample Handling and Custody

6.3.1. 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-4) will be observed during sample storage.

6.3.2. 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, laboratory personnel, or by courier service. The Field Coordinator will ensure that the cooler has been properly secured using clear plastic tape and custody seals.

6.3.3. 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 courier service or laboratory personnel. 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, catch basin solids and groundwater), 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. Field personnel will retain 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.

6.3.4. 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.

6.4. Analytical Methods

The methods of chemical analysis are identified in Table C-2 and C-3. All methods selected represent standard methods used for the analysis of these analytes in soil groundwater. The laboratory project manager will determine the remedy to be used if the project RLs cannot be attained, in consultation with GeoEngineers Quality Assurance Leader.

6.5. Quality Control

Table C-5 summarizes the types and frequency of QC samples to be analyzed, including both field QC and laboratory QC samples.

6.5.1. Field Quality Control

Field QC samples serve as a control and check mechanism to monitor the consistency of field 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. Table C-5 summarizes the types and frequency of field QC samples to be analyzed and the following sections discuss field QC samples.

6.5.1.1. FIELD DUPLICATES

Field duplicates serve as a measure 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 samples. For groundwater, one field duplicate will be collected for every sampling event given that less than ten samples will be collected as part of each sampling event.

6.5.1.2. TRIP BLANKS

Trip blanks accompany samples for volatile organic compound (VOC) analysis during field sampling and delivery to the laboratory. Trip blanks typically are analyzed at a rate of one trip blank per cooler containing samples for VOC analysis. Trip blanks will not be analyzed during this investigation because VOC analyses are part of the sampling and analysis plan.

6.5.1.3. 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 or groundwater sampling if reusable equipment are used for sampling. At least one equipment rinsate blank will be collected for every 20 soil samples collected.

3.5.2 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/Labeled compounds

6.5.1.4. 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. 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.

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.”

6.5.1.5. 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.

6.5.1.6. 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 analytical batch. The samples for the MS/MSD analyses should be collected from a 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.

6.5.1.7. 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.

6.5.1.8. 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 and most commonly consist of a second analysis on the extracted media.

6.5.1.9. SURROGATES/LABELED COMPOUNDS

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 the 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.

6.6. Instrument Testing, Inspection and Maintenance

The field coordinator will be responsible for overseeing the testing, inspection, and maintenance of all field equipment. The laboratory project manager will be responsible for laboratory equipment testing, inspection, and maintenance requirements. The calibration methods used in calibrating the analytical instrumentation are described in the following section.

6.7. Instrument Calibration and Frequency

6.7.1. 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.

6.7.2. 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.

All instrument calibrations and their appropriate chemical standards are to comply with the specific methods within EPA SW-846, Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, 3rd Edition, December 1996 and the Laboratory SOPs. Calibration documentation, initial (ICALs) and continuing (CCALs), will be retained at the Laboratory.

6.8. Inspection of Supplies and Consumables

Supplies and consumables for the field sampling effort will be inspected upon delivery and accepted if the condition of the supplies is satisfactory. For example, jars will be inspected to ensure that they are the correct size and quantity and were not damaged in shipment.

6.9. Data Management

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.

Following completion of the cleanup action and post-construction monitoring, the relevant data generated as part of the project will be reported to Ecology as required by the Consent Decree.

7.0 ASSESSMENT AND OVERSIGHT

7.1. Assessment and Response Actions

7.1.1. 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.

7.1.2. Response Actions for Field Sampling

The Field Coordinator, or a designee, will be responsible for correcting equipment malfunctions throughout the field sampling effort and resolving situations in the field that may result in nonconformance or noncompliance with the QAPP. All corrective measures will be documented in the field logbook.

7.1.3. Corrective Action for Laboratory Analyses

Laboratories are required to comply with their current written standard operating procedures. The laboratory project manager will be responsible for ensuring that appropriate corrective actions are initiated as required for conformance with this QAPP. All laboratory personnel will be responsible for reporting problems that may compromise the quality of the data to the laboratory project manager. A narrative describing the anomaly, the steps taken to identify and correct it, and the treatment of the relevant sample batch (i.e., recalculation, reanalysis, and re-extraction) will be submitted with the data package.

8.0 DATA VALIDATION AND USABILITY

8.1. Data Review, Verification and Validation

The data validation and usability elements of the QAPP as detailed below address the QA/QC activities that occur after data collection and/or data generation is complete. Implementation of these elements ensures that the data conform to the specified criteria and will achieve the project objectives

The data are not considered final until validated. All data, including laboratory and field QC sample results, will be summarized in a data validation report. The data validation report will focus on data that did not meet the MQOs specified in Table C-1. The data validation reports will be included as an appendix to the final RI report. The data report will also describe any deviations from this QAPP and actions taken to address those deviations.

Level III laboratory data packages will be obtained for all soil and groundwater samples. These data will be reviewed for the following QC parameters:

- Holding times and sample preservation
- Method blanks
- MS/MSD analyses
- LCS/LCSD analyses
- Surrogate spikes
- Duplicates/replicates
- Field/Lab duplicates
- Calibrations (Initial and Continuing)
- Internal Standards
- Instrument Tunes

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

8.2. Verification and Validation Methods

Hard-copy laboratory reports will be method detection limit (MDL)-generated providing the analysis-specific information including final sample analytical results, reportable field and laboratory QA/QC analytical results, MDLs and MRLs. The laboratory data will also be reported via electronic media using the tabular outputting capabilities of standard software formats.

The term “reporting limit” will be used interchangeably with “quantitation limit” to mean the lowest concentration at which an analyte can be quantified subject to the quality control criteria of the analytical method. These terms are different from “MDL,” which refers to the lowest concentration that the analytical method can ideally detect.

Data validation qualifiers including “U,” “J,” and “R” will be used following the reported laboratory results to explain data quality issues affecting the laboratory data to the data user. These qualifiers are explained as follows:

- “U” indicates that a compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit, which is corrected for dilution and percent moisture.
- “J” indicates that a compound was detected below the reporting limit and the value is estimated or the value was estimated by the validator because of instrument bias reasons.
- If any target analytes are found in a laboratory method blank, it will be regarded as blank contamination. In these cases, the result of a given analyte in the method blank will be compared to any positive result of the same analyte in the associated field samples. If a field sample result is less than five times (ten times for common laboratory contaminants like acetone, phthalates, etc.) the result that is reported in the method blank, the result will be considered blank contamination. Accordingly, the result will be qualified as not-detected “U” at the elevated reporting limit.
- If there are two analyses reported by the laboratory for one sample (as in the case of dilutions), the validator will make a decision as to which analysis to use in the final assessment. As there should be only one reported result per analyte for a given sample, any extraneous results will be qualified as not-reportable “R” and will not be used.

8.3. Reconciliation with User Requirements

A data quality assessment will be conducted by the project Quality Assessment Leader to identify cases where the projects MQOs were not met.

9.0 REFERENCES

- GeoEngineers, Inc., “Final Work Plan, Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158.” GEI File No. 5364-013-00, dated July 31, 2009.
- GeoEngineers, Inc. (2011a), “Engineering Design Report, Taxiway F Site, Skagit Regional Airport, Burlington, Washington.” GEI File No. 5364-013-03, dated July 15, 2011.
- GeoEngineers, Inc. (2011b), “Compliance Monitoring Plan, Taxiway F Site, Skagit Regional Airport, Burlington, Washington.” GEI File No. 5364-013-03, dated July 15, 2011.
- GeoEngineers, Inc. (2011c), “Draft Final Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158.” GEI File No. 5364-013-02, dated January 10, 2011.
- GeoEngineers, Inc. (2011d), “Draft Cleanup Action Plan, Taxiway F Site, Skagit Regional Airport,” GEI File No. 5364-013-03, dated February 28, 2011.

Washington State Department of Ecology (Ecology), “Minimum Standards for Construction and Maintenance of Wells”, Chapter 173-160 WAC, update November 2006.

U.S. Environmental Protection Agency (USEPA), “Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, EPA-540-R-08-01.” June 2008.

U.S. Environmental Protection Agency (USEPA), “Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, OSWER 9240.1-45, EPA 540-R-04-004.” October 2004.

Washington State Department of Ecology (Ecology), “Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies.” July 2004.

Table C-1
Measurement Quality Objectives
Taxiway F Site, Skagit Regional Airport
Burlington, Washington

Laboratory Analysis	Reference Method	QC Check Standards (Laboratory Control Samples & Matrix Spike Samples) Limits			Surrogate Standards (SS) %R Limits ¹	Field Duplicate Samples RPD Limits ²	
		Soil %R	Water %R	RPD		Soil	Water
				Both Soil/Water	Soil/Water		
Chlorinated Pesticides (mg/kg)							
Endosufan I	8081A-GC/ECD	60-140	60-140	20	30-111(TCMX), 33-119 (DCB), W: 30-88(TCMX), 39-111 (DCB)	≤50%	≤35%
Endosufan II	8081A-GC/ECD	60-140	60-140	20	30-111(TCMX), 33-119 (DCB), W: 30-88(TCMX), 39-111 (DCB)	≤50%	≤35%
Endosulfan sulfate	8081A-GC/ECD	60-140	60-140	20	30-111(TCMX), 33-119 (DCB), W: 30-88(TCMX), 39-111 (DCB)	≤50%	≤35%
Aldrin	8081A-GC/ECD	27-99	40-108	S:10 / W: 19	30-111(TCMX), 33-119 (DCB), W: 30-88(TCMX), 39-111 (DCB)	≤50%	≤35%
Dieldrin	8081A-GC/ECD	33-92	44-116	S: 10 / W: 15	30-111(TCMX), 33-119 (DCB), W: 30-88(TCMX), 39-111 (DCB)	≤50%	≤35%
Heptachlor	8081A-GC/ECD	29-101	46-112	S: 13 / W: 18	30-111(TCMX), 33-119 (DCB), W: 30-88(TCMX), 39-111 (DCB)	≤50%	≤35%
Heptachlor Epoxide	8081A-GC/ECD	NA	NA	NA	NA	NA	NA
Herbicides (mg/kg)							
Dinoseb	8151A-GC/MS	60-140	60-140	20	62-128 (DCAA)	≤50%	≤35%
MCPA	8151A-GC/MS	NA	NA	NA	NA	NA	NA
2,4-D	8151A-GC/MS	25-84	60-140	S: 28 / W: 20	S:30-96/ W:30-93 (DCAA)	≤50%	≤35%
Bentazon	8151A-GC/MS/8321B	NA	34-124	NA	17-138 (DCPAA)	NA	NA

Notes:

The surrogate %R and laboratory control sample/matix spike sample soil %R control limits are preliminary and are subject to change once proper control limits are submitted by the laboratory.

Method numbers refer to EPA SW-846 Analytical Methods or Washington State Department of Ecology (Ecology) recommended analytical methods.

* Default control limits - laboratory did not have enough data points for a control limit study.

¹ Individual surrogate recoveries are compound-specific.

² RPD control limits are only applicable if the concentrations are greater than 5 times the method reporting limit (MRL). For results less than 5 times the MRL, the difference between the sample and duplicate than 2 times the MRL for soils and 1 times the MRL for waters.

mg/kg = Milligrams per kilogram

%R = Percent recovery

RPD = Relative Percent Difference

NA = Not Applicable

Table C-2

Methods of Analysis and Target Reporting Limits for Soil Samples
Taxiway F Site, Skagit Regional Airport
Burlington, Washington

Analyte	Analytical Method	Target Reporting Limit
Chlorinated Pesticides (mg/kg)		
Endosufan I	8081A-GC/ECD *	0.025
Endosufan II	8081A-GC/ECD *	0.025
Endosulfan sulfate	8081A-GC/ECD *	0.025

Notes:

mg/kg = Milligrams per kilogram

* = With qualitative confirmation by MS

Table C-3

Methods of Analysis and Target Reporting Limits for Groundwater Samples

Taxiway F Site, Skagit Regional Airport

Burlington, Washington

Analyte	Analytical Method	Target Reporting Limit
Chlorinated Pesticides (µg/L)		
Aldrin	8081A-GC/ECD *	0.05
Dieldrin	8081A-GC/ECD *	0.05
Heptachlor	8081A-GC/ECD *	0.05
Heptachlor Epoxide	8081A-GC/ECD *	0.05
Herbicides (µg/L)		
Dinoseb	8151A-GC/MS-SIM	0.1
MCPA	8151A-GC/MS-SIM	0.2
2,4-D	8151A-GC/MS-SIM	0.2
Bentazon	8151A-GC/MS-SIM/8321B	0.1

Notes:

µg/L = Micrograms per liter

* = With qualitative confirmation by MS

Table C-4
Test Methods, Sample Containers, Preservation & Hold Times
Taxiway F Site, Skagit Regional Airport
Burlington, Washington

Analysis	Method	Soil				Groundwater			
		Minimum Sample Size	Sample Containers	Sample Preservation	Holding Times	Minimum Sample Size	Sample Containers	Sample Preservation	Holding Times
Chlorinated Pesticides	EPA 8081A-GC/ECD	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	2x 1 L Bottles	1 L amber glass with Teflon-lined lid	Cool 4 °C (Na ₂ SO ₃ - dechlorinating agent)	7 days
Herbicides	EPA 8151A-GC/MS SIM	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	2x 1 L Bottles	1 L amber glass with Teflon-lined lid	Cool 4 °C (Na ₂ SO ₃ - dechlorinating agent)	7 days

Notes:

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

Na₂SO₃ = Sodium sulfite

oz = ounce

L = liter

g = gram

Table C-5
Quality Control Samples - Type and Frequency
Taxiway F Site, Skagit Regional Airport
Burlington, Washington

Samples Collected for Chemical Analytical Testing	Field QC		Laboratory QC			
	Field Duplicates	Trip Blanks	Method Blanks	LCS	MS / MSD	Lab Duplicates
Soil	1 per every 10 samples	NA	1/batch	1/batch	1/batch	1/batch
Groundwater	1 per every sampling event	NA	1/batch	1/batch	1/batch	1/batch

Notes:

An analytical 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).

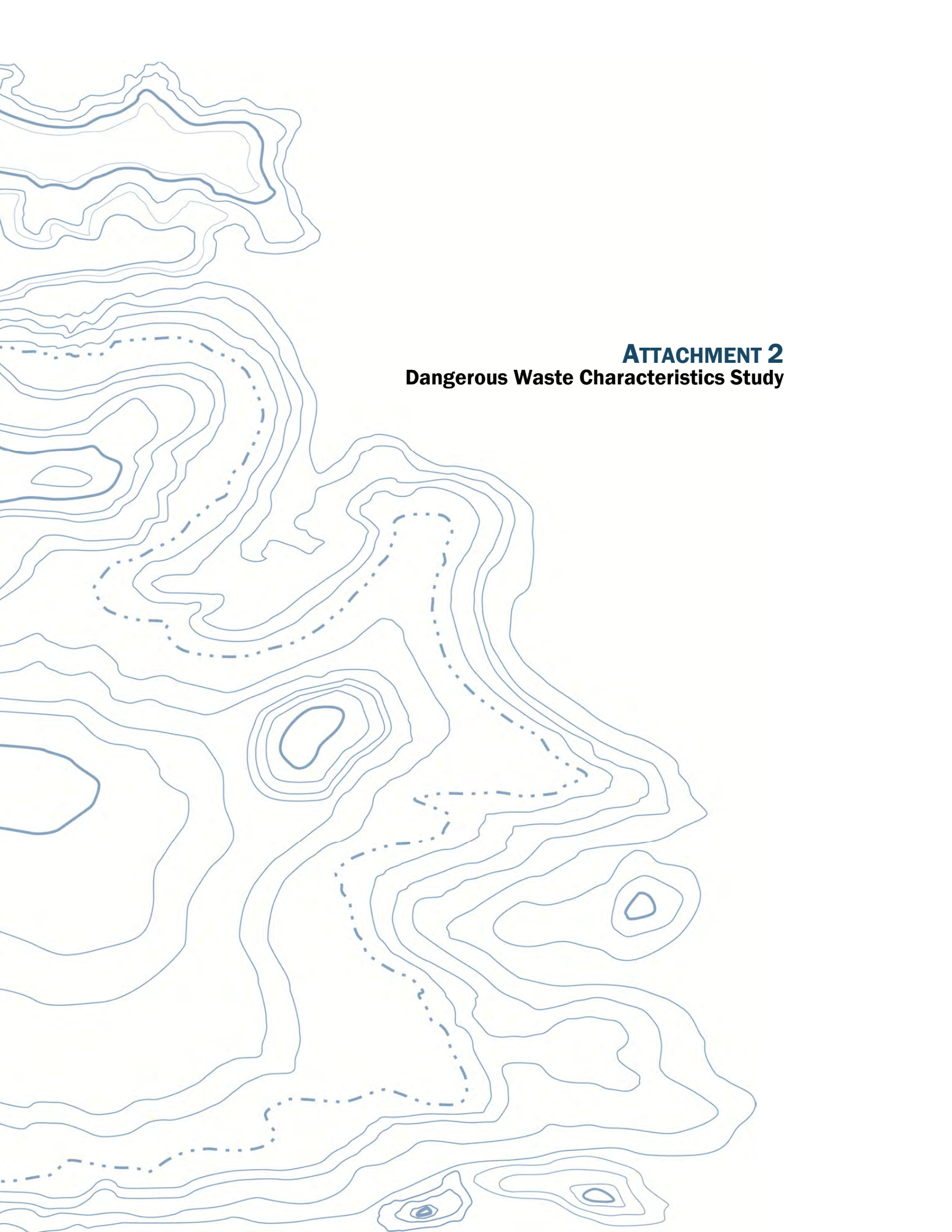
No more than 20 field samples can be contained in one batch.

LCS = Laboratory control sample

MS = Matrix spike sample

MSD = Matrix spike duplicate sample

NA = Not Applicable



ATTACHMENT 2
Dangerous Waste Characteristics Study



Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, Washington 98101
206.728.2674

July 11, 2011

Port of Skagit County
PO Box 348
Burlington, Washington 98233

Attention: Sara Young

Subject: Dangerous Waste Characterization Study
Taxiway F Site, Skagit Regional Airport
Burlington, Washington
File No. 5364-013-03

INTRODUCTION

This letter documents the results a dangerous waste characterization study completed in April 2011 at the Taxiway F Site (Site) generally located near the western edge of the Skagit Regional Airport in Burlington, Washington. The data obtained during this study supplements existing soil characterization data summarized in the Remedial Investigation/Feasibility Study (RI/FS) and Cleanup Action Plan (CAP) prepared for the Site (GeoEngineers, 2011a; GeoEngineers, 2011b). Soil sampling activities were conducted in accordance with plan approved by the Washington State Department of Ecology (Ecology) dated April 13, 2011.

During previous Site studies, pesticides (heptachlor, heptachlor epoxide and chlordane) were detected in soil at concentrations greater than 20 times¹ the associated toxicity characteristic threshold listed in WAC 173-303-090(8) (Figure 1). Based on these previous results, representative samples of the soil were obtained from the Site and analyzed by the toxicity characteristic leaching procedure (TCLP) for chlordane, heptachlor and heptachlor epoxide because the detected concentrations exceeded the 20 times the trigger value (0.6 mg/kg, 0.16 mg/kg and 0.16 mg/kg respectively).

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>



Soil Sampling and Chemical Analytical Results

Soil Sampling

GeoEngineers obtained five composite soil samples (V-Comp, W-Comp, X-Comp, Y-Comp and Z-Comp) from the Site on April 18, 2011. The samples were obtained from near-surface soil (0 to 6 inches) at the approximate locations shown in Figure 2 using a shovel and/or a stainless steel trowel. The shovel and/or trowel were decontaminated with a soap solution (Liquinox™ and distilled water) and a distilled water rinse between sampling attempts.

Samples were placed in laboratory prepared containers and kept cool during transport to the chemical analytical testing laboratory. Standard chain-of-custody procedures were followed in transporting the samples to the testing laboratory.

Chemical Analysis

Composite soil samples V-Comp, W-Comp, X-Comp, Y-Comp and Z-Comp obtained from the Site were submitted to OnSite Environmental Inc. of Redmond, Washington for chemical analysis using the toxicity characteristic leaching procedure (TCLP) for chlordane, heptachlor and heptachlor epoxide.

Analytical Data Review

The laboratory maintains an internal quality assurance program as documented in its laboratory quality assurance manual. The laboratory uses a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries, matrix spike duplicate recoveries, blank spike recoveries and blank spike duplicate recoveries to evaluate the analytical results. The laboratory also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The data quality goals were included in the laboratory reports. The laboratory compared each group of samples with the existing data quality goals and noted any exceptions in the laboratory reports. No significant data quality exceptions were noted in the laboratory reports or during our review.

Chemical Analytical Results

Based on the TCLP results (Table 1), soil represented by samples V-Comp, W-Comp, X-Comp, Y-Comp and Z-Comp do not designate as a toxicity characteristic dangerous waste because the TCLP chlordane, heptachlor and heptachlor epoxide were detected at concentrations less than the maximum concentration of contaminants for the toxicity characteristic (WAC 173-303-090).

Chemical analytical results are presented in Table 1. A copy of the laboratory report is attached.

LIMITATIONS

We have prepared this report for the exclusive use of the Port of Skagit County, their authorized agents and regulatory agencies in their evaluation of the cleanup action at the Taxiway F Site located at the Skagit Regional Airport in Burlington, Washington. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.



Our interpretation of soil conditions for this study is based on field observations, field screening and chemical analysis of a limited number of widely spaced soil samples. It is always possible that contamination not identified by our study exists in soil that was not sampled or analyzed.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this letter was prepared. No warranty or other conditions, express 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 will serve as the official document of record.

We appreciate the opportunity to provide these services to the Port of Skagit County. If you have any questions regarding the contents of this study please call us at 206.728.2674.

Yours very truly,

GeoEngineers, Inc.



Robert Trahan
Geologist



John Herzog, PhD
Principal

RST:JMH:mlh:csv

Attachments:

Table 1. Soil TCLP Results

Figure 1. Site Plan Showing Area with 20-Times TCLP Rule Exceedances

Figure 2. Site Plan Showing TCLP Sample Locations

Attachment A. Field Methods

Attachment B. Chemical Analytical Program

Disclaimer: 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 will serve as the official document of record.

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Table 1**Soil TCLP Results**

Taxiway F Site, Skagit Regional Airport
Burlington, Washington

TCLP Analyte	Sample ID	W-COMP	V-COMP	W-COMP	X-COMP	Y-COMP	Z-COMP	TCLP DW Levels (mg/L)
	Sample Area	W	V	W	X	Y	Z	
	Sample Date	4/18/2011	4/18/2011	4/18/2011	4/18/2011	4/18/2011	4/18/2011	
	Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Heptachlor		0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.008
Heptachlor Epoxide		0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.008
gamma-Chlordane		0.00005 U	0.00005 U	0.00005 U	0.00026	0.00005 U	0.00005 U	--
alpha-Chlordane		0.000069	0.00005 U	0.000069	0.00047	0.00005 U	0.00005 U	--
Chlordane (Total)		0.000069 T	0.00005 UT	0.000069 T	0.00073 T	0.00005 UT	0.00005 UT	0.03

Notes:

TCLP = Toxicity characteristic leaching procedure.

-- = Not established.

U = Not detected above the method reporting limit for the sample.

T = Listed value was calculated by summing reported values for individual constituents.

mg/L = micrograms per liter

Bolding indicates that the analyte was detected.

Map Revised: June 16, 2011

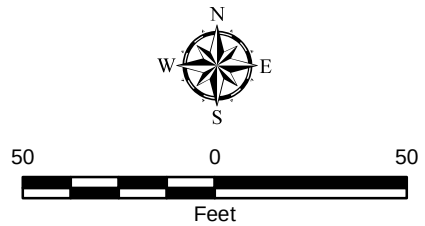
AJ.TCK

Path: \\sea\projects\564013\GIS\56401302_FIG1_TCLPSitePlan.mxd

Office: SEA



- Legend**
- Locations in which 20-Times TCLP rule exceedance was not observed
 - Locations in which 20-Times TCLP rule exceedance was observed
 - Area with 20-Times TCLP rule exceedance
 - Limits of Excavation
 - Historical Operations Area
 - Fence Line



Reference: Aerial photo (dated 2004) from Skagit County. Historical Operations Area boundary and fence line obtained from Hart Crowser (2008b).

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. cannot 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.

Site Plan Showing Area with 20-Times TCLP Rule Exceedance	
Taxiway F Site Burlington, Washington	
	Figure 1

Map Revised: June 16, 2011

AJTCK

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Office: SEA



Legend

- Discrete Sampling Locations
- Area with 20-Times TCLP rule exceedance
- Limits of Excavation
- Historical Operations Area
- Fence Line

Reference: Aerial photo (dated 2004) from Skagit County. Historical Operations Area boundary and fence line obtained from Hart Crowser (2008b).

Notes:

1. Discrete samples collected from each Area (V through Z) were composited to create a single composite sample. For example: Z1 through Z5 was composited to create Z-COMP.
2. Discrete samples were collected from 0 to 1.2 feet below ground surface.
3. Composite samples collected from each Area were analyzed of TCLP Chlordane and Heptachlor (and its epoxide) using EPA 1311/8081A on a standard turnaround time. Discrete samples collected from each Area were submitted on hold.
4. The locations of all features shown are approximate.
5. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot 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.

Site Plan Showing TCLP Sampling Locations

Taxiway F Site
Burlington, Washington



Figure 2

ATTACHMENT A
Field Methods

ATTACHMENT A FIELD METHODS

General

A representative from our staff was on-site during excavation activities to evaluate subsurface conditions. Soil with physical evidence of contamination (odors, staining, sheens, etc.) was excavated and removed from the Site for permitted disposal. Soils encountered were visually classified in general accordance with American Society for Testing and Materials (ASTM) D 2488-94.

Soil Sampling Procedures

Soil samples were obtained from the bucket of the excavator using a stainless steel trowel (test pit explorations or directly from the remedial excavation sidewalls and base. Each sample that was submitted for analysis was identified by a unique sample designation that corresponded to its mapped sample location and depth. Sample containers were filled completely to minimize headspace. The remaining portion of each sample was used for field screening. The sampling equipment was decontaminated prior to each use with a Liqui-Nox® solution wash and a distilled water rinse. The samples were placed in an iced cooler pending transport to the analytical laboratory. Chain-of-custody procedures were followed in transporting the samples to the laboratory.

Field Screening of Soil Samples

Soil samples obtained from the remedial excavations were screened in the field for evidence of petroleum contamination. Field screening results can be used as a general guideline to delineate areas of potential petroleum-related contamination in soils. In addition, screening results are used to aid in the selection of soil samples for chemical analysis. The screening methods used for this project included: (1) visual examination; (2) water sheen screening; and (3) headspace vapor screening with a photoionization detector (PID).

Visual screening consists of inspecting the soil for stains indicative of petroleum-related contamination. Visual screening is generally more effective when contamination is related to heavy petroleum hydrocarbons such as motor oil, or when hydrocarbon concentrations are high. Water sheen screening and headspace vapor screening are more sensitive methods that have been effective in detecting contamination at concentrations less than regulatory cleanup levels.

Water sheen screening involves placing soil in a pan of distilled water and observing the water surface for signs of sheen. Sheen screening may detect both volatile and nonvolatile petroleum hydrocarbons. Sheen classifications are as follows:

No Sheen (NS)	No visible sheen on water surface.
Slight Sheen (SS)	Light, colorless, dull sheen; spread is irregular, not rapid; sheen dissipates rapidly.
Moderate Sheen (MS)	Light to heavy sheen, may have some color/iridescence; spread is irregular to flowing; few remaining areas of no sheen on water surface.



Heavy Sheen (HS)

Heavy sheen with color/iridescence; spread is rapid; entire water surface may be covered with sheen.

Headspace vapor screening involves placing a soil sample in a plastic sample bag. Air is captured in the bag, and the bag is shaken to expose the soil to the air trapped in the bag. The probe of a PID is inserted into the bag, and the instrument measures the concentration of organic vapor in the air removed from the sample headspace. The PID measures concentrations in parts per million (ppm) and is calibrated to isobutylene. The PID is designed to quantify organic vapor concentrations in the range between 1 and 2,000 ppm.

Field screening results are site-specific and vary with soil type, soil moisture content, temperature and type of contaminant. The presence or absence of a sheen does not necessarily indicate the presence or absence of petroleum hydrocarbons in the sample.

ATTACHMENT B
Chemical Analytical Program

ATTACHMENT B CHEMICAL ANALYTICAL PROGRAM

Samples

Chain-of-custody procedures were followed during the transport of the field samples to the accredited analytical laboratory. The samples were held in cold storage pending extraction and/or analysis. The analytical results and laboratory quality control (QC) records are included in this attachment. The analytical results are summarized in the text and tables of this report.

Analytical Data Review

The laboratory maintains an internal quality assurance program as documented in its laboratory quality assurance manual. The laboratory uses a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries, matrix spike duplicate recoveries, blank spike recoveries and blank spike duplicate recoveries to evaluate the analytical results. The laboratory also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The data quality goals were included in the laboratory reports. The laboratory compared each group of samples with the existing data quality goals and noted any exceptions in the laboratory report. Any data quality exceptions documented by the laboratory were reviewed by GeoEngineers and are addressed in the data quality exception section of this attachment.

Data Quality Exception Summary

No quality control exceptions were noted by the testing laboratory. It is our opinion that the analytical data are of acceptable quality for their intended use in this report.



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

April 26, 2011

John Herzog
GeoEngineers, Inc.
600 Stewart, Suite 1700
Seattle, WA 98101-1233

Re: Analytical Data for Project 5364-013-03
Laboratory Reference No. 1104-114

Dear John:

Enclosed are the analytical results and associated quality control data for samples submitted on April 18, 2011.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read 'DB', with a long horizontal line extending to the right.

David Baumeister
Project Manager

Enclosures

Date of Report: April 26, 2011
Samples Submitted: April 18, 2011
Laboratory Reference: 1104-114
Project: 5364-013-03

Case Narrative

Samples were collected on April 18, 2011 and received by the laboratory on April 18, 2011. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: April 26, 2011
Samples Submitted: April 18, 2011
Laboratory Reference: 1104-114
Project: 5364-013-03

ANALYTICAL REPORT FOR SAMPLES

Client ID	Laboratory ID	Matrix	Date Sampled	Date Received	Notes
Z-COMP	04-114-25	Soil	4-18-11	4-18-11	
Y- COMP	04-114-26	Soil	4-18-11	4-18-11	
X- COMP	04-114-27	Soil	4-18-11	4-18-11	
W- COMP	04-114-28	Soil	4-18-11	4-18-11	
V- COMP	04-114-29	Soil	4-18-11	4-18-11	

Date of Report: April 26, 2011
 Samples Submitted: April 18, 2011
 Laboratory Reference: 1104-114
 Project: 5364-013-03

**TCLP ORGANOCHLORINE
 PESTICIDES by EPA 1311/8081**

Matrix: TCLP Extract
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	Z-COMP					
Laboratory ID:	04-114-25					
Heptachlor	ND	0.050	EPA 8081	4-20-11	4-22-11	
Heptachlor Epoxide	ND	0.050	EPA 8081	4-20-11	4-22-11	
gamma-Chlordane	ND	0.050	EPA 8081	4-20-11	4-22-11	
alpha-Chlordane	ND	0.050	EPA 8081	4-20-11	4-22-11	
Surrogate:	Percent Recovery	Control Limits				
TCMX	74	38-103				
DCB	89	46-120				
Client ID:	Y-COMP					
Laboratory ID:	04-114-26					
Heptachlor	ND	0.050	EPA 8081	4-20-11	4-22-11	
Heptachlor Epoxide	ND	0.050	EPA 8081	4-20-11	4-22-11	
gamma-Chlordane	ND	0.050	EPA 8081	4-20-11	4-22-11	
alpha-Chlordane	ND	0.050	EPA 8081	4-20-11	4-22-11	
Surrogate:	Percent Recovery	Control Limits				
TCMX	70	38-103				
DCB	87	46-120				
Client ID:	X-COMP					
Laboratory ID:	04-114-27					
Heptachlor	ND	0.050	EPA 8081	4-20-11	4-22-11	
Heptachlor Epoxide	ND	0.050	EPA 8081	4-20-11	4-22-11	
gamma-Chlordane	0.26	0.050	EPA 8081	4-20-11	4-22-11	
alpha-Chlordane	0.47	0.050	EPA 8081	4-20-11	4-22-11	
Surrogate:	Percent Recovery	Control Limits				
TCMX	76	38-103				
DCB	83	46-120				

Date of Report: April 26, 2011
 Samples Submitted: April 18, 2011
 Laboratory Reference: 1104-114
 Project: 5364-013-03

**TCLP ORGANOCHLORINE
 PESTICIDES by EPA 1311/8081**

Matrix: TCLP Extract
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	W-COMP					
Laboratory ID:	04-114-28					
Heptachlor	ND	0.050	EPA 8081	4-20-11	4-22-11	
Heptachlor Epoxide	ND	0.050	EPA 8081	4-20-11	4-22-11	
gamma-Chlordane	ND	0.050	EPA 8081	4-20-11	4-22-11	
alpha-Chlordane	0.069	0.050	EPA 8081	4-20-11	4-22-11	P
Surrogate:	Percent Recovery	Control Limits				
TCMX	79	38-103				
DCB	85	46-120				
Client ID:	V-COMP					
Laboratory ID:	04-114-29					
Heptachlor	ND	0.050	EPA 8081	4-20-11	4-22-11	
Heptachlor Epoxide	ND	0.050	EPA 8081	4-20-11	4-22-11	
gamma-Chlordane	ND	0.050	EPA 8081	4-20-11	4-22-11	
alpha-Chlordane	ND	0.050	EPA 8081	4-20-11	4-22-11	
Surrogate:	Percent Recovery	Control Limits				
TCMX	78	38-103				
DCB	88	46-120				

Date of Report: April 26, 2011
 Samples Submitted: April 18, 2011
 Laboratory Reference: 1104-114
 Project: 5364-013-03

**TCLP ORGANOCHLORINE
 PESTICIDES by EPA 1311/8081
 METHOD BLANK QUALITY CONTROL**

Matrix: TCLP Extract
 Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0420W1					
Heptachlor	ND	0.050	EPA 8081	4-20-11	4-22-11	
Heptachlor Epoxide	ND	0.050	EPA 8081	4-20-11	4-22-11	
gamma-Chlordane	ND	0.050	EPA 8081	4-20-11	4-22-11	
alpha-Chlordane	ND	0.050	EPA 8081	4-20-11	4-22-11	
Surrogate:	Percent Recovery	Control Limits				
TCMX	66	38-103				
DCB	77	46-120				

Date of Report: April 26, 2011
 Samples Submitted: April 18, 2011
 Laboratory Reference: 1104-114
 Project: 5364-013-03

**TCLP ORGANOCHLORINE
 PESTICIDES by EPA 1311/8081
 MS/MSD QUALITY CONTROL**

Matrix: TCLP Extract

Units: ug/L (ppb)

					Source	Percent	Recovery				
Analyte	Result		Spike Level		Result	Recovery	Limits	RPD	RPD	Limit	Flags
MATRIX SPIKES											
Laboratory ID:	04-114-26										
	MS	MSD	MS	MSD		MS	MSD				
Heptachlor	0.806	0.843	1.00	1.00	ND	81	84	33-118	4	25	
Heptachlor Epoxide	0.895	0.919	1.00	1.00	ND	89	92	33-116	3	25	
Surrogate:											
TCMX						74	77	38-103			
DCB						86	88	46-120			



Data Qualifiers and Abbreviations

- A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.
- B - The analyte indicated was also found in the blank sample.
- C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.
- E - The value reported exceeds the quantitation range and is an estimate.
- F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.
- H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.
- I - Compound recovery is outside of the control limits.
- J - The value reported was below the practical quantitation limit. The value is an estimate.
- K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.
- L - The RPD is outside of the control limits.
- M - Hydrocarbons in the gasoline range are impacting the diesel range result.
- M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.
- N - Hydrocarbons in the lube oil range are impacting the diesel range result.
- N1 - Hydrocarbons in diesel range are impacting lube oil range results.
- O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.
- P - The RPD of the detected concentrations between the two columns is greater than 40.
- Q - Surrogate recovery is outside of the control limits.
- S - Surrogate recovery data is not available due to the necessary dilution of the sample.
- T - The sample chromatogram is not similar to a typical _____.
- U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- U1 - The practical quantitation limit is elevated due to interferences present in the sample.
- V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.
- W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.
- X - Sample extract treated with a mercury cleanup procedure.
- Y - Sample extract treated with an acid/silica gel cleanup procedure.
- Z -
- ND - Not Detected at PQL
- PQL - Practical Quantitation Limit
- RPD - Relative Percent Difference

Chain of Custody

Company: GEOENGINEERS INC.

Project Number: 5364-013-03

Project Name: TAXIWAY - F

Project Manager: JOHN HERZOG

Sampled by: ABHIJIT JOSHI

Turnaround Request (in working days)

(Check One)

☐ Same Day ☐ 1 Day

☐ 2 Days ☐ 3 Days

☐ Standard (7 Days)
(TPH analysis 5 Days)

☐ _____ (other)

Laboratory Number:

04-114

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number	NWTPH	NWTPH	NWTPH	NWTPH	Volatiles	Halogen	Semivolatiles (with 10)	PAHs 8	PCBs 6	Organochlorine	Organophosphorus	Chlorine	Total R	TCLP	HEM (C							% Moisture
1	Z1	4/18/11		SOIL	2																						
2	Z2																										
3	Z3																										
4	Z4																										
5	Z5																										
6	Y1																										
7	Y2																										
8	Y3																										
9	Y4																										
10	Y5																										

Signature	Company	Date	Time	Comments/Special Instructions
	<u>GEI</u>	<u>04/18/11</u>	<u>1805</u>	<u>EMAIL RESULTS TO JOHN, ABHIJIT AND MARK</u>
	<u>OnSite Env</u>	<u>4/18/11</u>	<u>1805</u>	
Reviewed/Date	Reviewed/Date	Chromatograms with final report ☐		

Chain of Custody

Company: GEOENGINEERS INC.
Project Number: 5364-00013-03
Project Name: TAXIWAY F
Project Manager: JOHN HERZOG
Sampled by: ABHIJIT JOSHI

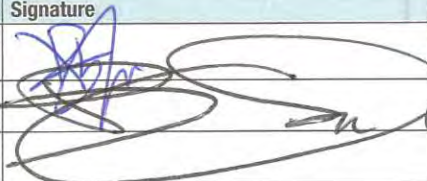
Turnaround Request (in working days)

(Check One)

☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☐ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

Laboratory Number: 04-114

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx	Volatiles 8260B	Halogenated Volatiles 8260B	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082	Organochlorine Pesticides 8081A	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA / MTCA Metals (circle one)	TCLP Metals	HEM (oil and grease) 1664	% Moisture
11	X1	4/18/11		SOIL	2																
12	X2																				
13	X3																				
14	X4																				
15	X5																				
16	W1																				
17	W2																				
18	W3																				
19	W4																				
20	W5																				

Signature	Company	Date	Time	Comments/Special Instructions
	<u>GEI</u>	<u>04/18/11</u>	<u>1805</u>	
	<u>OnSite Env.</u>	<u>4/18/11</u>	<u>1805</u>	
Relinquished				
Received				
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date	Reviewed/Date	Chromatograms with final report ☐		

Chain of Custody

Company: GEOENGINEERS INC
Project Number: 5364-013-03
Project Name: TAXIWAY F
Project Manager: JOHN HERZOG
Sampled by: ABHIJIT JOSHI

Turnaround Request (in working days)

(Check One)

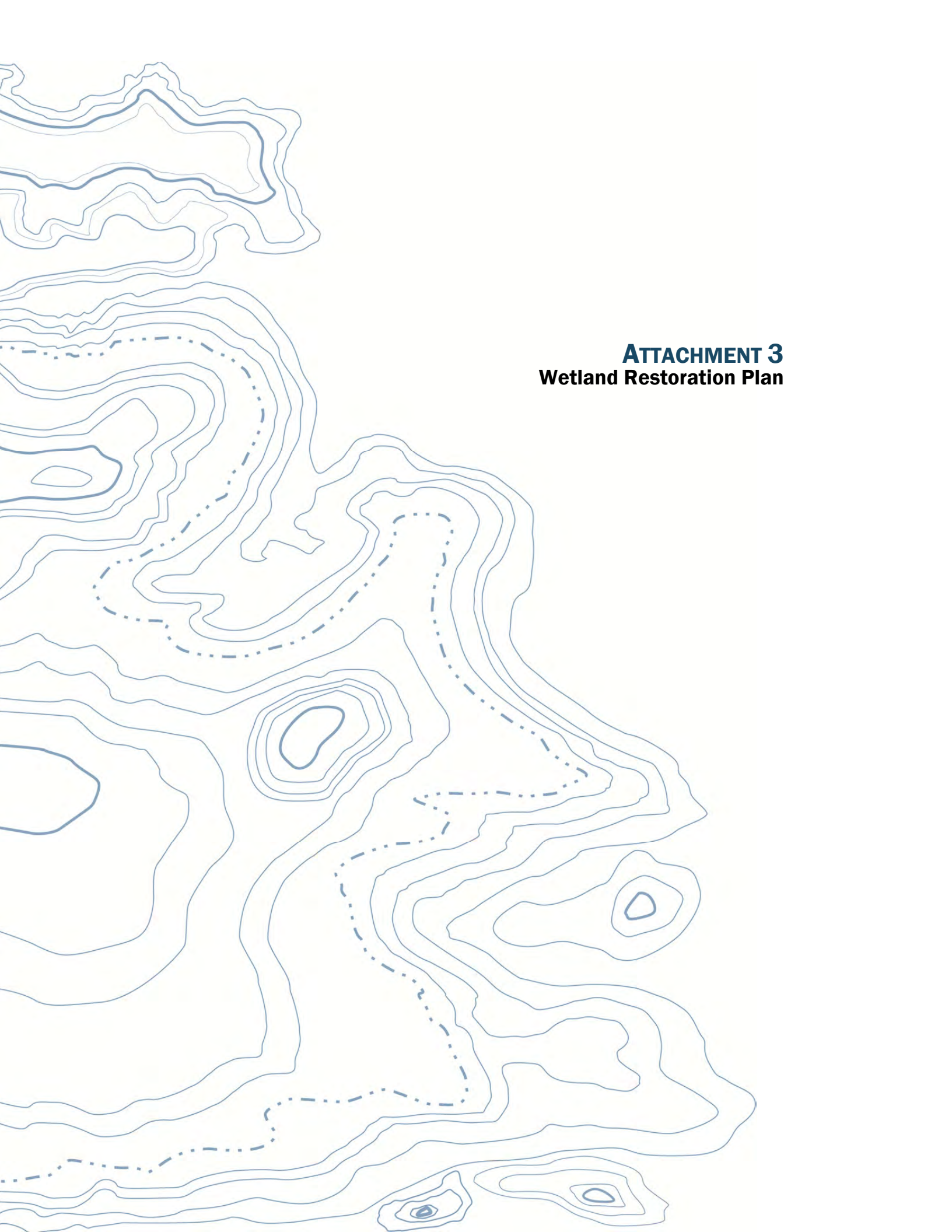
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

Laboratory Number:

04-114

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx	Volatiles 8260B	Halogenated Volatiles 8260B	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082	Organochlorine Pesticides 8081A	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total PCRA / MTCA Metals (circle one)	TCLP Metals	HEM (oil and grease) 1664	TCLP CHLORDANE	TCLP HEPTACHLOR	TCLP HEPTACHLOR EPOXIDE	% Moisture
21	VI	4/18/11		SOIL	2																			
22	V2																							
23	V3																							
24	V4																							
25	Z-COMP																					XXX		
26	Y-COMP																							
27	X-COMP																							
28	W-COMP																							
29	V-COMP																							
30	UI																							

Signature	Company	Date	Time	Comments/Special Instructions
	GEI	04/18/11	1805	
	OnSite Env	4/18/11	1805	
Relinquished				
Received				
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date	Reviewed/Date	Chromatograms with final report ☐		



ATTACHMENT 3
Wetland Restoration Plan

Updated Wetland Restoration Plan

Port of Skagit County– Taxiway F Site
Skagit County, Washington

for

Port of Skagit County

January 27, 2011



600 Stewart Street, Suite 1700
Seattle, WA 98101
206.728.2732

Updated Wetland Restoration Plan
Port of Skagit County– Taxiway F Site
Skagit County, WA

File No. 05364-013-02

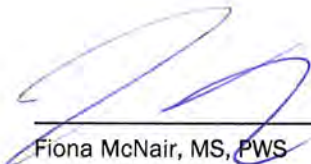
January 27, 2011

Prepared for:

Port of Skagit County
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Prepared by:

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FMM:JMH:csv
<https://projects.geoengineers.com/sites/0536401302/Finals>

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1.0 INTRODUCTION

This Updated Wetland Restoration plan, presents proposed wetland restoration actions to compensate for wetland impacts from proposed cleanup of the Taxiway F Site (the Site) of the Skagit Regional Airport in Skagit County, WA (Figure 1 – Vicinity Map). The site is situated within Section 4 of Township 34 North and Range 3 East of the Willamette Meridian. The study area totals approximately 5 acres in size, and includes the Farmers Supply site (fenced area with hangar and asphalt/gravel driveway immediately adjacent to Taxiway F) and adjacent upland and wetland areas to the east and south.

The Port of Skagit County (Port) is completing a cleanup study of the Site in accordance with Washington State Department of Ecology (Ecology) Agreed Order No. 6158 (the Agreed Order; Ecology, 2009), the Model Toxics Control Act (MTCA) and associated implementing regulations (i.e., Chapter 173-340 Washington Administrative Code [WAC]). The Site is formally referenced in the Ecology databases as the “Skagit County Port Site” (Ecology Facility/Site ID# 67457634). Following the completion of the cleanup study, a remedial action will be completed in accordance with the Ecology Cleanup Action Plan for the Site.

The objective of this document is to update the existing Wetland Restoration Plan (Hart Crowser, 2008c) referenced in the Nationwide Permit 38 (NW-2008-19-NO) currently issued for the project. The wetland restoration updates are based on the expected impacts to wetlands and the proposed restoration measures to compensate for those impacts within the Site resulting from the current proposed remediation actions for the Site. In addition, this report compares the wetland impacts from the previously proposed cleanup actions (Hart Crowser, 2008b) to those from the current proposed Cleanup Action Plan to be approved by Ecology. The revised restoration activities, goals, performance standards, monitoring, maintenance and contingency procedures in this report are based on those previously proposed by Hart Crowser (Hart Crowser, 2008c) however, adjusted to the revised area of impact. Wetland impact and restoration areas from current proposed remediation do not completely overlap with permit-referenced wetland impact and restoration areas and the new proposed remediation area would impact fewer square feet of wetlands.

If approved by the Corps this updated Wetland Restoration Plan will become the referenced document for the special condition of the project Nationwide Permit 38 (NW-2008-19-NO).

1.1 Project Background

The Port has owned the Site property since approximately the mid-1960s and, from approximately 1978 to 2000, periodically leased parts of the property to various businesses performing aerial pesticide application (crop dusting). In recent years, wetland and upland areas to the north, south and east of the Farmers Supply site have been used for cattle grazing, although this activity is currently not allowed at the Site because of its cleanup status. Environmental investigations conducted at the Site between 2001 and 2009 have detected pesticides and herbicides at concentrations exceeding regulatory screening criteria in soil, groundwater, and surface water (Environmental Associates, Inc. [EAI], 2000; GeoEngineers, 2001, 2004, and 2009; Hart Crowser, 2006 and 2008a).

In 2006, Hart Crowser prepared a Remedial Investigation/Feasibility Study (RI/FS) (Hart Crowser, 2006) to support site assessment activities and present remedial alternatives under the Model Toxics Control Act (MTCA) Voluntary Cleanup Program (VCP). Hart Crowser prepared a Draft Cleanup Action Plan (CAP) for the Site in 2008 (Hart Crowser, 2008b). The VCP RI/FS and Addendum discussed site contamination issues,

presented an analysis of the nature and extent of contamination and historical sources and addressed the applicable cleanup alternatives for the site, given the identified environmental conditions and redevelopment scenario.

The proposed cleanup activities included excavation and removal of soil containing pesticide concentrations above the MTCA cleanup levels and placement of clean, import fill. Some of the cleanup areas proposed in the CAP (Hart Crowser, 2008b) were located within wetlands regulated by the U.S. Army Corps of Engineers (Corps) and the Washington Department of Ecology (Ecology). In 2008, Hart Crowser prepared a Wetland Restoration Plan for the Site (Hart Crowser, 2008c) which was submitted to the Corps and approved as a special condition of the Nationwide Permit (NW-2008-19-NO).

Between September 2009 and September 2010 an updated RI was completed for the Site under a formal Agreed Order from Ecology. The Agreed Order work is being completed in general accordance with GeoEngineers, Inc. (GeoEngineers) "Final Work Plan, Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport," (GeoEngineers, 2009). The results of previous investigations conducted prior to 2009 (Hart Crowser RI/FS and CAP) were incorporated into the updated RI. The "Draft Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport," dated September 14, 2010, was submitted to Ecology for review in accordance with the requirements of the Agreed Order. Comments provided by Ecology have been incorporated into the Final RI/FS and a Cleanup Action Plan is currently being prepared.

2.0 EXISTING SITE CONDITIONS

The site has been evaluated for the presence of wetlands (Hart Crowser, 2007) and for the presence of contamination (Environmental Associates, Inc. [EAI], 2000; GeoEngineers, 2001, 2004, and 2009; Hart Crowser, 2006 and 2008a). The site consists of a fenced area that contains a Hangar building, asphalt and gravel areas and grassy and shrub upland and wetland areas. In addition, areas to the east and southeast of the fenced area were also evaluated for wetlands and contamination and are part of the site.

2.1 Wetlands

The site contains four wetlands, Wetlands A, B, C, and D (Figure 2 and Table 2-1). The Critical Areas Report produced for the site presents detailed information about the wetlands (Hart Crowser, 2007). The fenced area contains all of Wetlands B and C and portions of Wetlands A and D. Wetland D extends north of the fenced area and Wetland A extends north, east and south of the fenced area (Figure 2).

Wetlands B, C and D are small Category IV wetlands. Vegetation in Wetlands C and D consist primarily of emergent plants while the dominant vegetation in Wetland B consists of shrubs. Wetland A possesses both emergent (northern portion) and forested (southern portion) plant communities.

TABLE 2-1. SUMMARY INFORMATION FOR WETLANDS AT THE SITE

Wetland	Cowardin Vegetation Class ¹	Size (square feet)	Wetland Category ²
Wetland A	Forested & Emergent	95,561	III
Wetland B	Scrub-Shrub	303	IV
Wetland C	Emergent	73	IV
Wetland D	Emergent	3,141	IV
TOTAL		53,478	

Notes:

1 – Cowardin vegetation class assigned based on *Classification of Wetland and Deep Water Habitats of the United States* (Cowardin et al 1979), as reported in the Hart Crowser Critical Areas Report (Hart Crowser, 2007).

2 – Wetland Category based on the Washington State Wetland Rating System for Western Washington (Hruby, 2004), as reported in the Hart Crowser Critical Areas Report (Hart Crowser, 2007).

The *Critical Areas Report* produced for the site (Hart Crowser, 2007) states that “dominant vegetation at the site consists of a mix of upland and wetland vegetation including Western redcedar (*Thuja plicata*), red alder (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), black cottonwood (*Populus balsamifera*), hardhack (*Spiraea douglasii*), Scouler’s willow (*Salix scoulerana*), salmonberry (*Rubus spectabilis*), vine maple (*Acer circinatum*), Indian plum (*Oemleria cerasiformis*), swamp gooseberry (*Ribes lacustre*), red elderberry (*Sambucus racemosa*), Himalayan blackberry (*Rubus armeniacus*), evergreen blackberry (*Rubus lacinatus*), poison-hemlock (*Conium maculatum*), sword fern (*Polystichum munitum*), lady fern (*Athyrium filix-femina*), stinging nettle (*Urtica dioica*), soft rush (*Juncus effusus*), slough sedge (*Carex obnupta*), piggy-back plant (*Tolmiea menziesii*), large-leaf avens (*Geum macrophyllum*), trailing blackberry (*Rubus ursinus*), false lily-of-the-valley (*Maianthemum dilatatum*), reed canarygrass (*Phalaris arundinacea*), and a variety of native and non-native grasses.”

3.0 WETLAND IMPACTS AND RESTORATION

3.1 Current Proposed Remediation: Wetland Impacts and Restoration

Implementation of current proposed remediation/cleanup actions at the site (GeoEngineers, 2011) will involve excavation within Wetlands A, B, C, and D (Figure 2, Table 3-1). Contaminated soils will be removed and replaced with clean topsoil. All remediated areas will be re-vegetated as described in Section 3.3 and as shown on Figure 3. Currently planned remediation areas, as shown on Figure 3, mark the expected restoration boundaries. If additional grading and/or excavation are required, the restoration boundaries will extend to the limits of the additional work area. The combined wetland cleanup areas are approximately 31,464 square feet in size. Table 3-1 below provides a summary of the current proposed wetland impact and restoration areas.

TABLE 3-1. CURRENT PROPOSED WETLAND IMPACTS AND RESTORATION AREAS

Wetland	Cowardin Vegetation Class Impacted	Plant Communities to be Restored	Current (2010/2011) Wetland Impact and Restoration Areas (square feet)
Wetland A	Forested	Tree and shrub	25,519
	Emergent	Grass and emergent	3,897
Wetland B	Scrub-Shrub	Shrub	229
Wetland C	Emergent	Grass and emergent	73
Wetland D	Emergent	Grass and emergent	1,746
TOTAL			31,464

3.2 Comparison of Permit-Referenced and Current Proposed Remediation Actions

Differences in wetland impact and restoration areas between permit-referenced remediation areas (Hart Crowser, 2008c) and current proposed remediation areas (GeoEngineers, 2011) are presented in Figures 2 and 3, and Table 3-2. Current proposed remediation areas impact 31,464 square feet of wetland areas compared with permit-referenced wetland impacts of 53,478 square feet, a difference of 22,014 less square feet.

TABLE 3-2. WETLAND IMPACTS AND RESTORATION AREAS, CURRENT PROPOSED REMEDIATION

Wetland	Cowardin Vegetation Class Impacted	Plant Communities to be Restored	Permit-Referenced (2007/2008) Wetland Impact and Restoration Areas ¹ (square feet)	Current (2010/2011) Wetland Impact and Restoration Areas (square feet)
Wetland A	Forested	Tree and shrub	46,259 ²	25,519
	Emergent	Grass and emergent	3,702 ²	3,897
Wetland B	Scrub-Shrub	Shrub	303	229
Wetland C	Emergent	Grass and emergent	73	73
Wetland D	Emergent	Grass and emergent	3,141	1,746
TOTAL			53,478	31,464

Notes:

1 – 2007/2008 impact areas presented in this table were taken directly from the wetland impacts and restoration table on page 4 of the original Wetland Restoration Report (Hart Crowser, 2008c). The permit-referenced remediation area within Wetland A shown on Figure 2 of this report was based on the *Remediation Contingency Area* shown on Figure 2 of the Wetland Restoration Plan (Hart Crowser, 2008c).

2 – Based on the *Remediation Contingency Area* shown on Figure 2 of the Wetland Restoration Plan (Hart Crowser, 2008c) anticipated impacts for Wetland A were: 57,546 square feet of forested wetland impacts and 7,294 square feet of emergent wetland impacts.

The previously estimated excavation volumes for permit-referenced remediation areas are presented below in Table 3-3 and are based on information presented in Hart Crowser's Cleanup Action Plan (Hart Crowser, 2008b). The estimated excavation volumes for current proposed remediation areas are presented below in Table 3-3, and are based on information presented in the *Draft Final Remedial Investigation/Feasibility Study*

(GeoEngineers, 2011). Current proposed remediation actions will excavate approximately 1,398 cubic yards (37,757 cubic feet) of soils within wetland areas compared with permit-referenced remediation actions which proposed to excavate 3,961 cubic yards (106,956 cubic feet) of soils within wetland areas, a difference of 2,563 less cubic yards (69,199 cubic feet).

TABLE 3-3. COMPARISON OF EXCAVATION VOLUMES IN WETLANDS FROM PERMIT-REFERENCED AND CURRENT PROPOSED REMEDIATION AREAS

Wetland	Cowardin Vegetation Class Impacted	Permit-Referenced Volume of Excavation in Wetlands ¹		Current Proposed Volume of Excavation in Wetlands ²	
		(cubic feet)	(cubic yards)	(cubic feet)	(cubic yards)
Wetland A	Forested	92,518	3,427	30,623	1,134
	Emergent	7,404	274	4,676	173
Wetland B	Scrub-Shrub	606	22	275	10
Wetland C	Emergent	146	5	88	3
Wetland D	Emergent	6,282	233	2,095	78
TOTAL		106,956	3,961	37,757	1,398

Notes:

- 1 Proposed volume to be excavated within wetlands was calculated assuming an average remedial excavation depth of 2 feet (Cleanup Action Plan - Hart Crowser, 2008).
- 2 Proposed volume to be excavated within wetlands was calculated assuming an average remedial excavation depth of 1.2 feet (GeoEngineers, 2011).

3.3 Re-Vegetation within Wetland, Upland and Buffer Areas

Specific re-vegetation actions proposed for each restoration area are discussed below. Plant installation shall occur during the late fall or early spring or as appropriate to enhance probability of success. Plant material shall be obtained from a reputable nursery. Plant quantity estimates presented below are based on 10-foot-on-center spacing for trees and 5-foot-on-center spacing for shrubs. Plant species can be placed randomly throughout the identified restoration area at these densities, with some clumping of plants by species.

3.3.1 Wetland A

Wetland A contains both forested and emergent plant communities. After contaminated soils have been removed and replaced with clean topsoil material, the forested wetland restoration area will be planted with 320 trees, including black cottonwood (*Populus balsamifera*) and western redcedar (*Thuja plicata*) and 1,275 shrubs, including twinberry (*Lonicera involucrata*), salmonberry (*Rubus spectabilis*), and hardhack (*Spiraea douglasii*), as presented in Table 3-4.

Within Wetland A, to the maximum extent possible, larger trees will be preserved. Emergent portions of Wetland A and areas that currently are bare ground (e.g., the drainage within the northern portion of Wetland A) will be re-vegetated with a native grass/emergent seed mixture (Table 3-5).

TABLE 3-4. PLANT SPECIES AND QUANTITIES ESTIMATES FOR FORESTED AND SCRUB-SHRUB WETLAND RESTORATION AREAS

Wetland	Restoration Area	Vegetation Strata	Species Common Name	Species Scientific Name	Plant Stock Container Size (gallon)	Quantity
A	Forested	Tree ¹	Black cottonwood	<i>Populus balsamifera</i>	1	120
			Western redcedar	<i>Thuja plicata</i>	1	200
		Shrub ²	Twinberry	<i>Lonicera involucrata</i>	1	425
			Salmonberry	<i>Rubus spectabilis</i>	1	425
			Hardhack	<i>Spiraea douglasii</i>	1	425
B	Scrub-shrub	Shrub	Hardhack	<i>Spiraea douglasii</i>	1	12

Notes:

1- 320 total trees will be planted in the 25, 519 square-foot Forested Wetland Restoration Area for Wetland A. This number was based on 10-foot-on-center spacing for trees.

2 - 1275 total shrubs will be planted in the 25, 519 square-foot Forested Wetland Restoration Area for Wetland A. This number was based on 5-foot-on-center spacing for shrubs.

3 - 12 shrubs will be planted in the 229 square-foot Scrub-Shrub Wetland Restoration Area for Wetland B. This number was based on 5-foot-on-center spacing for shrubs

3.3.2 Wetland B

Wetland B is a scrub-shrub wetland. Remediated areas within Wetland B (approximately 229 square feet) will be re-vegetated with shrubs. After contaminated soils have been removed and replaced with clean topsoil material, the scrub-shrub wetland restoration area within Wetland B will be planted with 12 hardhack (*Spiraea douglasii*) shrubs as presented in Table 3-4. Remediated areas of Wetland B will be re-vegetated with a native grass/emergent seed mixture (Table 3-5) to help stabilize soils.

3.3.3 Wetland C

Wetland C is an emergent wetland, currently dominated by reed canarygrass. All of Wetland C is within the proposed remediation area. After contaminated soils have been removed and replaced with clean topsoil material Wetland C will be re-vegetated with a native grass/emergent seed mixture (Table 3-5).

3.3.4 Wetland D

Wetland D is an emergent wetland, currently dominated by reed canarygrass and soft rush associated with a small ditch. The proposed remediation and restoration area within Wetland D is approximately 1,746 square feet. After contaminated soils have been removed and replaced with clean topsoil material, disturbed portions of Wetland D will be re-vegetated with a native grass/emergent seed mixture (Table 3-5).

3.3.5 Native Grass Emergent Seed Mix

To provide erosion control and habitat value, a native grass/emergent seed mixture will be applied throughout the identified restoration areas (Table 3-5). The new grass and rush plants will compensate for removal of grasses and forbs at the project site. As discussed in the Hart Crowser Wetland Restoration Plan (Hart Crowser, 2008c), the seed mixture presented in Table 3-5, or a similar mixture designed to tolerate both wet and dry conditions, will be applied at a rate of 30 pounds per acre using the following approved methods:

1. Hydroseeder (option of combining seeding, tackifiers, and tracers);
2. Blower equipment with adjustable disseminating device capable of maintaining a constant, measured rate of material discharge that will ensure an even distribution of seed at the rate specified;
3. Power-drawn drilling equipment or seeders; and
4. Manual seeding method.

TABLE 3-5. WETLAND/EMERGENT SEED MIX¹

Species Common Name	Species Scientific Name	Percent by Weight
Slender rush	<i>Juncus tenuis</i>	15
Colonial bentgrass	<i>Agrostis tenuis</i>	30
Velvet grass	<i>Holcus lanatus</i>	30
Kentucky bluegrass	<i>Poa pratensis</i>	25

Notes:

- 1 - Seed mix will be applied at a minimum of 30 pounds per acre.

3.4 Other Restoration Actions and Conditions

3.4.1 Fencing

It is assumed that livestock will remain off-site and not have access to the restoration areas. If livestock are permitted in the restoration area, a barbed-wire fence (or other fence appropriate for the type of livestock being excluded) shall be installed to prevent livestock from accessing restoration plantings. The condition of the fence shall be evaluated during each monitoring event and maintained as needed to keep livestock excluded from restoration areas.

3.4.2 Plant Installation and Flagging

Plant layout shall be completed by a qualified biologist or restoration ecologist, either by laying containerized plants out directing or placing pin flags.

All installed plants will be tied with colored flagging tape to assist in identification of installed plants during monitoring events.

3.4.3 Buffer Restoration

21,888 square feet of forested buffer area for Wetland A is within the remediation area and will be impacted. After contaminated soils have been removed and replaced with clean topsoil material, the forested buffer restoration area will be planted with 275 trees, including black cottonwood (*Populus balsamifera*), western redcedar (*Thuja plicata*) and bigleaf maple (*Acer macrophyllum*), and 1,095 shrubs, including vine maple (*Acer circinatum*), lady fern (*Athyrium filix-femina*), and red elderberry (*Sambucus racemosa*), as presented in Table 3-6. Within the forested buffer for Wetland A, to the maximum extent possible, larger trees will be preserved.

TABLE 3-6. PLANT SPECIES AND QUANTITIES ESTIMATES FOR BUFFER RESTORATION AREAS

Wetland Buffer	Restoration Area	Vegetation Strata	Species Common Name	Species Scientific Name	Plant Stock Container Size (gallon)	Quantity
A	Forested Buffer	Tree ¹	Black cottonwood	<i>Populus balsamifera</i>	1	75
			Western redcedar	<i>Thuja plicata</i>	1	125
			Bigleaf maple	<i>Acer macrophyllum</i>	1	74
		Shrub ²	Vine maple	<i>Acer circinatum</i>	1	365
			Lady fern	<i>Athyrium filix femina</i>	1	365
			Red elderberry	<i>Sambucus racemosa</i>	1	365

Notes:

1 – 275 total trees will be planted in the 21,888 square-foot forested buffer restoration area for Wetland A. This number was based on 10-foot-on-center spacing for trees.

2 – 1,095 total shrubs will be planted in the 21,888 square-foot forested buffer restoration area for Wetland A. This number was based on 5-foot-on-center spacing for shrubs.

Emergent buffer areas of Wetland A and non-wetland areas within the fenced area will be re-vegetated with an upland seed mix (Table 3-7).

TABLE 3-7. EROSION CONTROL UPLAND SEED MIX¹

Species Common Name	Species Scientific Name	Percent by Weight
White clover	<i>Trifolium repens</i>	20
Annual ryegrass	<i>Lolium perenne</i>	20
Creeping red fescue	<i>Festuca rubra</i>	60

Notes:

1 - Seed mix will be applied at a minimum of 30 pounds per acre.

3.4.4 Restoration Contingency

If during implementation of cleanup actions, areas outside of the current proposed remediation areas are disturbed, those areas will be re-vegetated with the appropriate native plant community (e.g., wetland emergent/grasses, wetland shrubs, wetland trees, upland grasses, upland shrubs or upland trees) (Tables 3-4 to 3-7) at planting densities and application rates identified above.

3.4.5 Construction Management

The contractor will be responsible for implementation of the planting plan, protection of the required restoration area, maintaining appropriate protective barriers, and field staking the construction areas. The contractor will be qualified as knowledgeable about landscape and plant installation. The Port will oversee the work and utilize a qualified biologist to oversee restoration activities, as needed.

4.0 MONITORING REQUIREMENTS AND PERFORMANCE STANDARDS

4.1 Monitoring Schedule

An as-built monitoring event shall occur within 2 weeks of project completion. An as-built report shall be generated and submitted to the agencies within 60 days of plant installation, or as required by permit conditions. The site shall be monitored once per year for five years following construction/implementation. Monitoring events shall occur at the end of the growing season for Years 1, 2, 3, 4, and 5. Annual monitoring reports shall be completed within four weeks of each monitoring event.

4.2 Performance Standards

Monitoring and maintenance performance standards for the site are presented below. These performance standards are to be compared with results from Years 1-5 monitoring events.

- Acceptable cover standards for native plants, summed across vegetation classes (native trees, shrubs, and/or native grasses/emergent vegetation), will be as follows:
 - 1st Year Monitoring Event: Minimum of 20 percent cover
 - 2nd Year Monitoring Event: Minimum of 40 percent cover
 - 3rd Year Monitoring Event: Minimum of 60 percent cover
 - 4th Year Monitoring Event: Minimum of 60 percent cover
 - 5th Year Monitoring Event: Minimum of 80 percent cover
- Invasive, exotic and undesirable species areal coverage shall be 10 percent or less after 5 years.
 - Years 1 through 5: 10 percent or less coverage of invasive, exotic or undesirable species

4.3 Monitoring Methods

Restoration area monitoring will include quantitative and qualitative data collection to measure the success of the restoration activities. A biologist or restoration specialist will conduct the monitoring at the site.

A biologist or restoration specialist will make general observations on the condition of the restoration site (e.g., plant cover, density, survival and presence of naturally colonizing plants). In addition, wildlife sightings

(e.g., bird, amphibian, reptile, and/or mammal) or signs of habitat use (e.g., scat, burrows, woodpecker damage, beaver sign) will be recorded during each monitoring event.

Restoration plant communities will be sampled along permanent vegetation transects. A minimum of two transects shall be established in Wetland A, and a minimum of one transect will be established in Wetlands B, C, and D. Transect locations and length shall be established during the as-built monitoring event. Transects shall be between 40 and 80 feet long. Along each transect, restoration plantings will be visually evaluated to determine survival rate, health, and vigor. Plants will be recorded as live, stressed, or dead/dying. Plant survival will be calculated in Years 1-5 by dividing the number of installed living plants by the number of initially installed plants (from the As-built Report).

Vegetation percent cover estimates will be made within circular quadrats (1-meter radius), along each transect. A minimum of 3 permanent quadrats will be established along each transect. The biologist will make visual estimates of percent cover of individual plant species present within each quadrat. Percent cover data shall be collected for installed native plants, volunteer plants (naturally recruited) and invasive species (e.g., Himalayan blackberry, reed canarygrass, Scot's broom, English ivy). Species coverage values will be summed to determine the total areal coverage in each quadrat.

Transect ends and quadrant centers shall be marked for the duration of the monitoring, to ensure that monitoring occurs at the same locations from year to year. A map of the vegetation zones, sample plots, and property boundaries shall be produced for the As-built Report for use during Year 1-5 monitoring events.

4.4 Maintenance and Contingency Procedures

Maintenance and contingency actions shall include, but are not limited to, irrigation, removal of noxious and invasive weeds, replacement of dead/dying plants or undesirable volunteer species, plant species substitution, application of repellents or browse control, addition of mulch, and weeding. Application of fertilizers after plant installation is not anticipated. Regular irrigation of the restoration plantings from late June to mid-September of the first two years, is recommended. If during a monitoring event, plants are observed to be stressed from lack of water, additional irrigation may be necessary.

5.0 LIMITATIONS

GeoEngineers has prepared this Wetland Restoration Plan for the Port of Skagit County Taxiway F site in general accordance with the scope and limitations of our proposal. Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices for wetland restoration plans at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

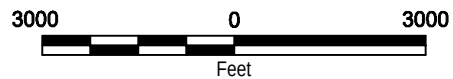
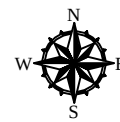
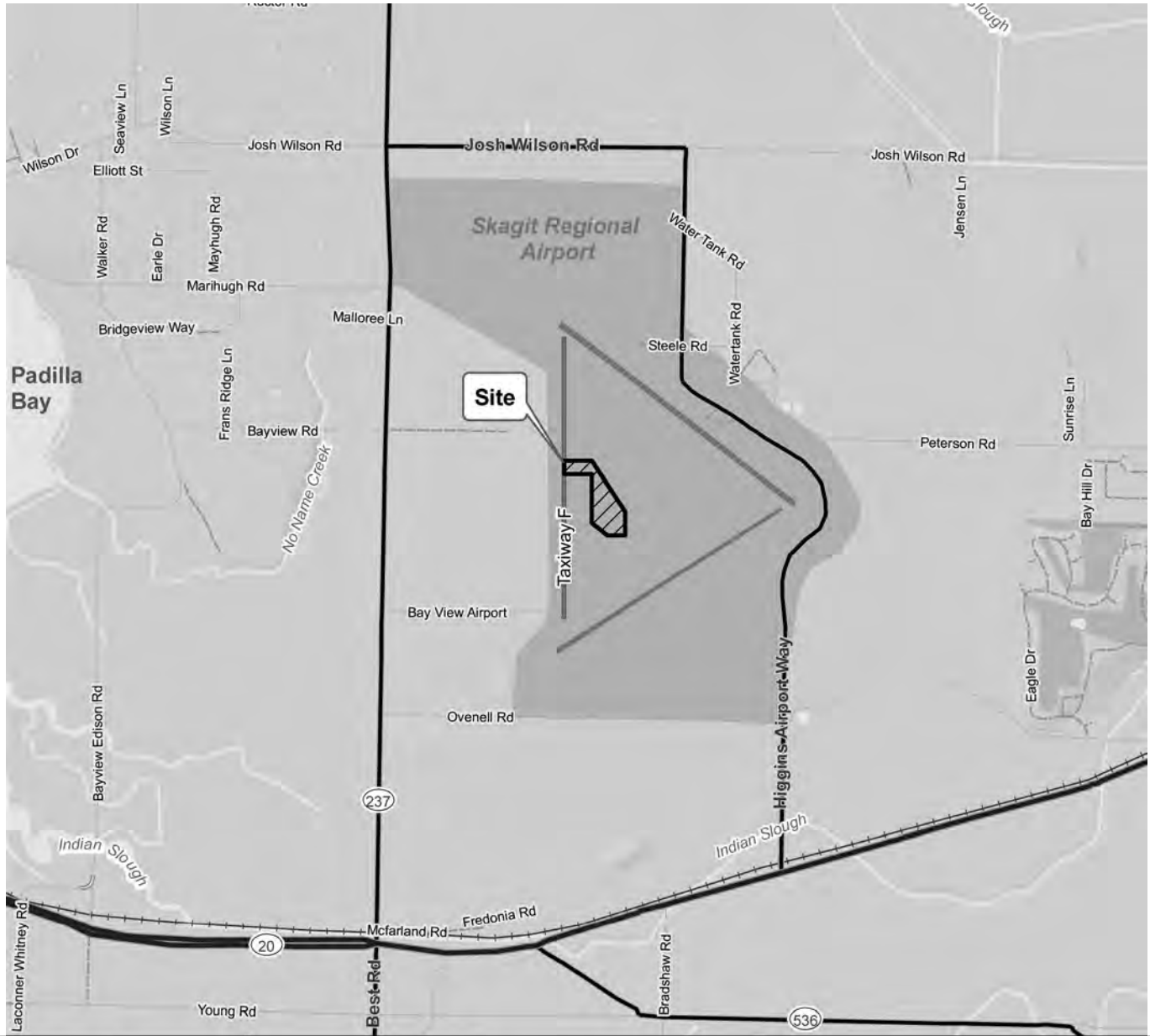
6.0 REFERENCES

Cowardin LM, Carter V, Golet FC, and LaRoe ET. 1979. Classification of Wetland and Deep Water Habitats of the United States. Performed for Office of Biological Services, Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C.

- EAI (Environmental Associates, Inc.). 2000. Soil Sampling and Testing. Skagit Farmers Supply – Port of Skagit Lease Property, Skagit County Airport, Skagit County, WA, Report JN 20250, dated September 19, 2000.
- GeoEngineers, Inc., 2011. “Draft Final Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158, dated January 10, 2011.
- GeoEngineers, Inc., 2009. “Final Work Plan, Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158, dated July 31, 2009
- GeoEngineers, Inc., 2004. “Report: Supplemental Surface Soil and Water Sampling and Testing January 2004, Former Skagit Farmers Supply Site, Skagit County, WA,” File No. 5364-003-03, dated May 5, 2004.
- GeoEngineers, Inc., 2001. “Report: Supplemental Soil and Groundwater Sampling, Former Skagit Farmers Supply Site, Skagit County, WA,” File No. 5364-003-01-1150, dated July 6, 2001.
- Hart Crowser, 2008a. “Focused Remedial Investigation/Feasibility Study Addendum, Skagit Farmers Supply Site, Burlington, Washington,” File No. 12053-18, Prepared for Port of Skagit County, dated June 30, 2008.
- Hart Crowser, 2008b. Cleanup Action Plan (CAP), Voluntary Cleanup Action, Skagit Farmers Supply Site, Burlington, Washington. Prepared for Port of Skagit County. June 30, 2008. File No. 12053-18. Hart Crowser, Seattle, Washington.
- Hart Crowser, 2008c. Wetland Restoration Plan, Port of Skagit County, Farmers Supply/Tronsdale Site, Skagit County, Washington. Prepared for Port of Skagit County. June 24, 2008. File No. 12053-18. Hart Crowser, Seattle, Washington.
- Hart Crowser. 2007. Critical Areas Report – Wetlands. Port of Skagit County Farmers Supply/Tronsdale Site. Skagit County, Washington. Prepared for Port of Skagit County. Hart Crowser Project # 12053-18.
- Hart Crowser. 2006. “Focused Remedial Investigation/Feasibility Study, Skagit Farmers Supply Site, Burlington, Washington,” Prepared for Port of Skagit County, File No. 12053-18, dated April 24, 2006.
- Hruby T. 2004. Washington State Wetland Rating System for Western Washington – Revised. Washington State Department of Ecology Publication #04-06-025.

SEC. 4, T34N, R03E, W.M.

LOG.: 48°28'13.85" NORTH - LAT.: 122°25'46.38" WEST



REFERENCE: ESRI DATA & MPAS, STREET MAPS 2005

PURPOSE:

REMOVE CONTAMINATED SOIL,
PLACE BACKFILL AND RESTORE.
REVERIFICATION OF PERMIT
(NWS-2008-19-NO)

ADJACENT PROPERTY OWNERS:

1. PORT OF SKAGIT COUNTY

VICINITY MAP

TAXIWAY F SITE
SKAGIT COUNTY, WA

IN: SKAGIT COUNTY

COUNTY OF: SKAGIT

STATE OF: WASHINGTON

APPLICATION BY:
PORT OF SKAGIT COUNTY

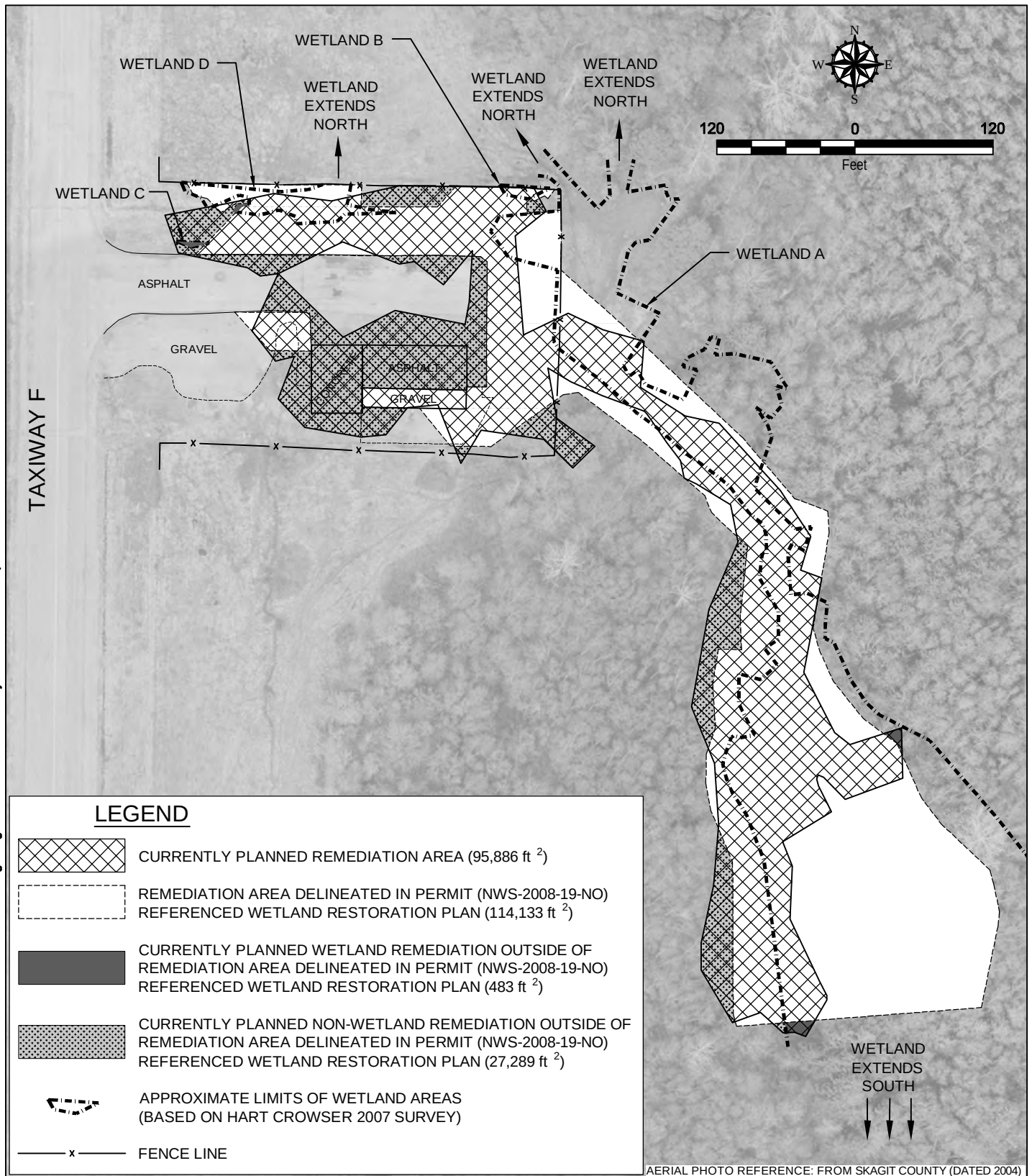
SHEET: 1 of 3

DATE: 01/14/11

CREATED BY: GEOENGINEERS, INC.

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OFFICE:SEA



PURPOSE:

REMOVE CONTAMINATED SOIL,
PLACE BACKFILL AND RESTORE.
REVERIFICATION OF PERMIT
(NWS-2008-19-NO)

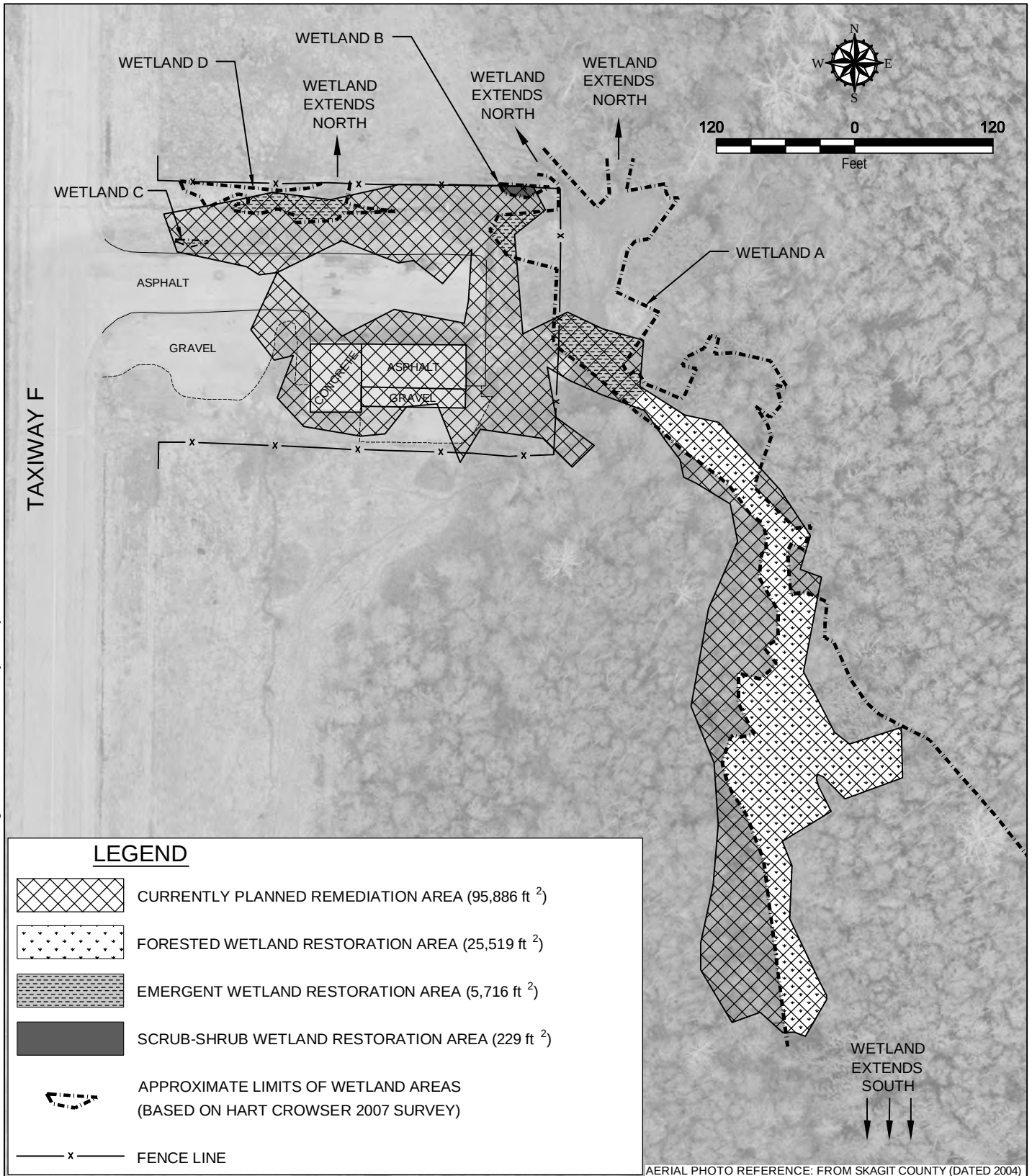
ADJACENT PROPERTY OWNERS:

1. PORT OF SKAGIT COUNTY

**SITE PLAN
REMEDATION AREAS**

TAXIWAY F SITE
SKAGIT COUNTY, WA

IN: SKAGIT COUNTY
COUNTY OF: SKAGIT
STATE OF: WASHINGTON
APPLICATION BY:
PORT OF SKAGIT COUNTY
SHEET: 2 of 3
DATE: 01/14/11
CREATED BY: GEOENGINEERS, INC.



PURPOSE:

REMOVE CONTAMINATED SOIL,
PLACE BACKFILL AND RESTORE.
REVERIFICATION OF PERMIT
(NWS-2008-19-NO)

ADJACENT PROPERTY OWNERS:

1. PORT OF SKAGIT COUNTY

**SITE PLAN
WETLAND RESTORATION
AREAS**

TAXIWAY F SITE
SKAGIT COUNTY, WA

IN: SKAGIT COUNTY

COUNTY OF: SKAGIT

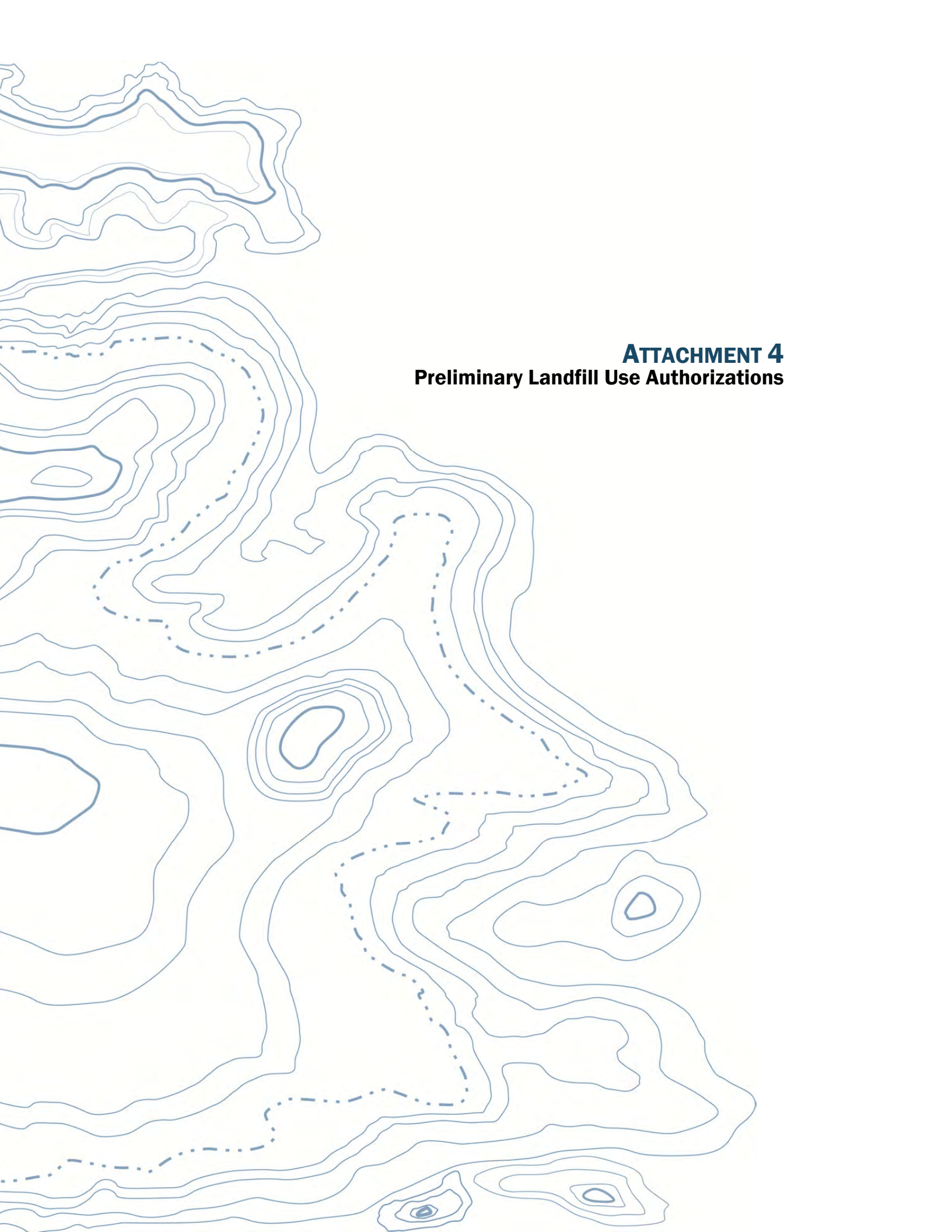
STATE OF: WASHINGTON

APPLICATION BY:
PORT OF SKAGIT COUNTY

SHEET: 3 of 3

DATE: 01/14/11

CREATED BY: GEOENGINEERS, INC.



ATTACHMENT 4
Preliminary Landfill Use Authorizations



Republic Services, Inc.

18500 N. Allied Way, Phoenix, AZ 85054

SPECIAL WASTE DEPARTMENT DECISION

Waste Profile #
4178117089

Expiration Date
5/21/2012

I. Decision Request:

☒ Initial ☐ Recertification ☐ Change

Disposal Facility: 4178 - Roosevelt Regional MSW L/F

Generator Name: Port of Skagit

Generator Site Address: 12005 Farm to Market Road

City: Burlington

County:

State: WA

Zip:

Name of Waste: Soil w/ Pesticides

Estimated Annual Volume: 2000 Cubic Yards

II. Special Waste Department Decision: ☒ Approved ☐ Rejected

Management Method(s): ☒ Landfill ☐ Solidification ☐ Bioremediation ☐ Transfer Facility

Problematic Special Waste according to Republic? ☐ Yes ☒ No

If yes, which one? _____

Approved by Special Waste Review Committee? ☐ Yes ☐ No ☒ Not Applicable

Precautions, Conditions or Limitations on Approval

Special Waste Analyst Signature: *Daniel Shuler*

Date: 5/27/2011

Name (Printed): Daniel Shuler

III. Facility Decision: ☐ Approved ☐ Rejected

Precautions, Conditions or Limitations on Approval

By signing below, the General Manager or Designee agrees that a fully executed Special Waste Service Agreement is on file for this profile and that the special waste file is complete.

General Manager or Designee: _____

Name (Printed): _____

Date: 5/27/2011



Republic Services, Inc.

18500 N. Allied Way, Phoenix, AZ 85054

SPECIAL WASTE DEPARTMENT DECISION

Waste Profile #
4178117088

Expiration Date
5/27/2012

I. Decision Request:

☒ Initial

☐ Recertification

☐ Change

Disposal Facility: 4178 - Roosevelt Regional MSW L/F

Generator Name: Port of Skagit

Generator Site Address: 12005 Farm to Market Road

City: Burlington

County:

State: WA

Zip:

Name of Waste: Soil w/ Pesticides Washington State Dangerous Waste per Profile Form

Estimated Annual Volume: 4000 Cubic Yards

II. Special Waste Department Decision:

☒ Approved

☐ Rejected

Management Method(s):

☒ Landfill

☐ Solidification

☐ Bioremediation

☐ Transfer Facility

Problematic Special Waste according to Republic?

☐ Yes

☒ No

If yes, which one?

Approved by Special Waste Review Committee?

☐ Yes

☐ No

☒ Not Applicable

Precautions, Conditions or Limitations on Approval

Special Waste Analyst Signature:

Daniel Shuler

Date: 5/27/2011

Name (Printed): Daniel Shuler

III. Facility Decision:

☐ Approved

☐ Rejected

Precautions, Conditions or Limitations on Approval

By signing below, the General Manager or Designee agrees that a fully executed Special Waste Service Agreement is on file for this profile and that the special waste file is complete.

General Manager or Designee:

Name (Printed):

Date: 5/27/2011

Wenatchee Landfill

191 Webb Road Wenatchee, Washington 98802

PERMIT # Preapproval

Tracking Number 648

PERMIT TO DISPOSE OF NON-HAZARDOUS MATERIALS

This permit authorizes disposal of Customer's waste materials in accordance with the Industrial Waste & Disposal Services Agreement dated ____.

EXPIRES:

GENERATOR: PORT OF SKAGIT - PREAPPROVAL ONLY

DESCRIPTION: WASHINGTON STATE SPECIAL WASTE SOILS - WP02, WT02	TONS: 9000
☐ SPECIAL WASTE ☒ PCS	
LOCATION: BURLINGTON, WASHINGTON 12005 FARM TO MARKET ROAD	COUNTY: * Skagit
CONTACT: ABHI JOSHI (GEOENGINEERS)	PHONE:
	FAX:

BILLING: Landfill account TBD	PO#: N/A	JOB#: N/A

We accept business checks, cash, or charge (with prior approval)

SPECIAL HANDLING : NOTE: Preapproval only, completed waste generator application must be submitted and customer (billing) established

APPROVED: 	KRISTIN CASTNER	DATE: 07/05/11 2:39:51 PM

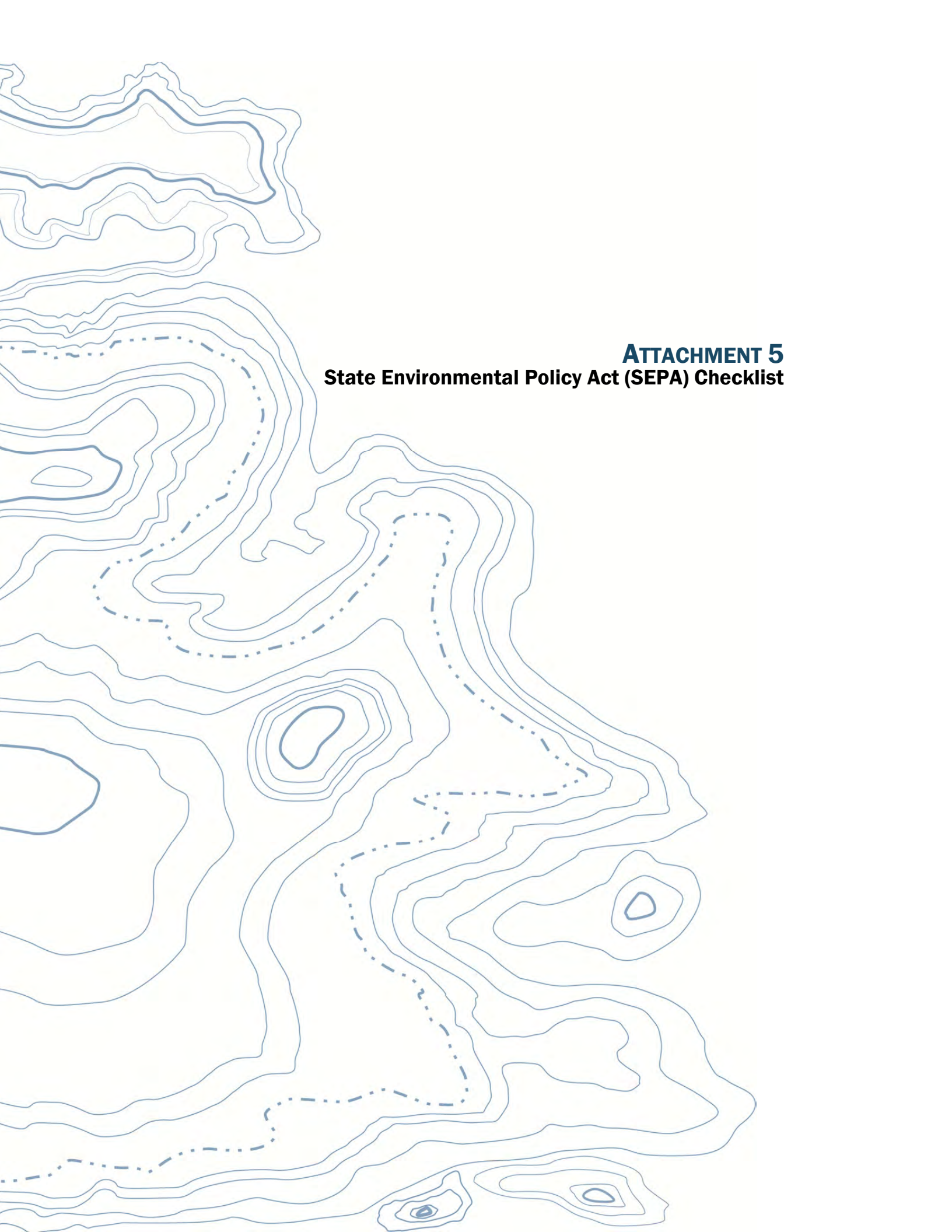
A COPY OF THIS PERMIT MUST BE SHOWN BY EACH DRIVER

THERE IS A MINIMUM ONE (1) TON CHARGE ON ALL SPECIAL WASTES



WASTE MANAGEMENT

HAZARDOUS WASTE IS STRICTLY PROHIBITED



ATTACHMENT 5
State Environmental Policy Act (SEPA) Checklist

ENVIRONMENTAL CHECKLIST

Purpose of Checklist:

The State Environmental Policy Act (SEPA), Chapter 43.21 RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for Applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring the preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the question from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply". Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or to provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." **IN ADDITION**, complete **the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS** (Part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable:

Taxiway F Site Cleanup, Skagit Regional Airport (Sheet 1 – Vicinity Map)

2. Name of applicant:

Port of Skagit County

3. Address and phone number of applicant and contact person:

Sara Young
Manager of Planning and Environmental Services
Port Administrative Offices
P.O. Box 348
Burlington, WA 98233
(360) 757-0011

4. Date checklist prepared:

February 15, 2011

5. Agency requesting checklist:

Department of Ecology

6. Proposed timing or schedule (including phasing, if applicable):

A cleanup contractor will be selected in approximately Spring 2011, with cleanup beginning as soon as soils are sufficiently dry (approximately August 1, 2011). Work will be conducted during the summer months and is expected to be complete by December 30, 2011.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

EAI (Environmental Associates, Inc.), Soil Sampling and Testing. Skagit Farmers Supply – Port of Skagit Lease Property, Skagit County Airport, Skagit County, WA, Report JN 20250, dated September 19, 2000.

GeoEngineers, Inc., 2011a. "Draft Final Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158, dated January 10, 2011.

GeoEngineers, Inc., 2011b. "Draft Cleanup Action Plan, Taxiway F Site, Skagit Regional Airport, Burlington, Washington, dated January 7, 2011.

GeoEngineers, Inc., 2011c, Updated Wetland Restoration Plan, Port of Skagit County, Taxiway F Site, Skagit County, Washington," File No. 05364-013-02, Prepared for Port of Skagit County, dated January 26, 2011.

GeoEngineers, Inc., 2010a, "Environmental Status Summary, Taxiway F Cleanup Site, Skagit Regional Airport, Letter to Port of Skagit County (Sara Young) from Christopher Bailey and John Herzog.

GeoEngineers, Inc., 2010b, "Sampling and Analysis Plan, Supplemental Soil Characterization in Dispersed Wetland Area, Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158," dated May 21, 2010.

GeoEngineers, Inc., 2009, "Final Work Plan, Remedial Investigation/Feasibility Study, Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158, dated July 31, 2009

GeoEngineers, Inc., 2004, "Report: Supplemental Surface Soil and Water Sampling and Testing January 2004, Former Skagit Farmers Supply Site, Skagit County, WA," File No. 5364-003-03, dated May 5, 2004.

GeoEngineers, Inc., 2001, "Report: Supplemental Soil and Groundwater Sampling, Former Skagit Farmers Supply Site, Skagit County, WA," File No. 5364-003-01-1150, dated July 6, 2001.

Hart Crowser, 2008a, "Wetland Restoration Plan, Port of Skagit County, Farmers Supply/Tronsdale Site, Skagit County, Washington," File No. 12053-18, Prepared for Port of Skagit County, File No. 12053-18, dated June 24, 2008.

Hart Crowser, 2008b, "Focused Remedial Investigation/Feasibility Study Addendum, Skagit Farmers Supply Site, Burlington, Washington," File No. 12053-18, Prepared for Port of Skagit County, dated June 30, 2008.

Hart Crowser, 2008c, "Cleanup Action Plan (CAP), Voluntary Cleanup Action, Skagit Farmers Supply Site, Burlington, Washington," Prepared for Port of Skagit County, File No. 12053-18, dated June 30, 2008.

Hart Crowser, 2008d, "Engineering Design Report, Skagit Farmers Supply Site, Burlington, Washington," Prepared for Port of Skagit County, File No. 12053-18, dated July 24, 2008.

Hart Crowser, 2007, Critical Areas Report – Wetlands. Port of Skagit County Farmers Supply/Tronsdale Site. Skagit County, Washington. Prepared for Port of Skagit County. Hart Crowser Project # 12053-18.

Hart Crowser, 2006, "Focused Remedial Investigation/Feasibility Study, Skagit Farmers Supply Site, Burlington, Washington," Prepared for Port of Skagit County, File No. 12053-18, dated April 24, 2006.

Pentec Environmental, 2005, Skagit Farmers Supply Site Terrestrial Ecological Evaluation and Status Report, Port of Skagit County, Skagit County Washington; Prepared for Port of Skagit County; April 15, 2005.

Washington State Department of Ecology (Ecology), "Agreed Order No. 6158 for Remedial Investigation/Feasibility Study – Taxiway F Site, Skagit Regional Airport, In the Matter of Remedial Action by: Port of Skagit County," dated April 10, 2009.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

- Clean Water Act, Section 404 Permit, United States Army Corps of Engineers Nationwide Permit (38) Cleanup of Hazardous and Toxic Waste
 - Awaiting Corps re-authorization under Nationwide Permit 38.
- Stormwater Permit, Washington State Department of Ecology
 - Notice of Intent for coverage under the Construction Stormwater General Permit will be filed with Ecology in February or March of 2011.

10. List any government approvals or permits that will be needed for your proposal, if known.

The cleanup action will be conducted under a Consent Decree with Ecology. Consequently, the cleanup action is exempt from the procedural requirements of certain laws and all local permits (WAC 173-340-710[9][a]) but must comply with the substantive requirements of these laws and permits. The exemption from procedural requirements applies to the:

- Washington Clean Air Act (RCW 70.94).
- Solid Waste Management Act (RCW 70.95).
- Hazardous Waste Management Act (RCW 70.105).
- Construction Projects in State Waters (RCW 75.20).
- Water Pollution Control Act (RCW 90.48).
- Shoreline Management Act (RCW 90.58).
- Any laws requiring or authorizing local government permits or approvals.

The exemption is not applicable if Ecology determines that the exemption would result in the loss of approval from a Federal agency that may be necessary for the State to administer any Federal law. The applicable and non-applicable required and exempt permit requirements/approvals are provided in the following sections.

The following permits/approvals are applicable to the cleanup action and do not fall under the procedural exemption of WAC -173-340-710[9][a].

- Clean Water Act, Section 404 Permit, United States Army Corps of Engineers Nationwide Permit (38) Cleanup of Hazardous and Toxic Waste
- Construction Stormwater General Permit, Washington State Department of Ecology
- State Environmental Policy Act, Washington State Department of Ecology

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page.

The Site will be subject to a remedial action as directed by the department of Ecology. Currently the Site is used by the Port for storage of equipment. Remediation will include excavation and disposal of soils at an approved landfill facility. Contamination at the Site was delineated as part of the the Site Remedial Investigation and Feasibility Study – both completed under formal order with Ecology. Site contamination is the result of historical crop dusting operations. The remediation area is approximately 95,886 square feet (2.2 acres). Soils will be removed from the top 6 inches to 2 feet. Following completion of the remediationexcavation the Site will be restored in accordance with the approved Wetland Restoration Plan and project permit. Future site use is expected to be consistent with the current site use.

12. Location of proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographical map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any applications related to this checklist.

The Taxiway F Site is located west of Burlington, WA in the northeast quarter of Section 4, Township 34N and Range 3E (Sheet 1). The site is east of Taxiway F on the western side of the Skagit Regional Airport. The *Former Skagit Farmers Supply Site* (original remediation area) is located within the fenced area of the Taxiway F site.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle/underline one): Flat, rolling, hilly, steep slopes or mountains. Other:

b. What is the steepest slope on the site (approximate percent slope)?

The slope is generally flat (2-3%) and gently slopes to the east.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Shallow soils at the Site consist of approximately 1 to 3 feet of fine to coarse sand and gravel. Clay and silt deposits occur beneath the shallow sandy/gravelly soils to depths of about 50 to 85 feet below ground surface (bgs). During wet weather conditions, perched groundwater has been observed at depths of 2 to 3 feet bgs, near the interface between the shallow sand and gravel horizon and the underlying clay/silt unit. Beneath the clay/silt unit, granular soils consisting of fine to medium sand with varying amounts of silt and gravel are present to the maximum depth explored (115 feet bgs). Unconfined groundwater occurs at a depth of approximately 100 feet bgs in the sandy soils beneath the thick clay/silt unit.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

None

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

The remediation area is approximately 95,886 square feet (2.2 acres) (Sheet 2). Soils will be removed from the top 6 inches to 2 feet for an approximate volume of 3,200 cubic yards.

Vegetation in the drainage channel and wetland areas will be cleared and grubbed. Surface soils at the Site with concentrations of COCs above MTCA cleanup levels, will be excavated to an expected depth of 6 inches to 2 feet. The lateral limits of the excavation are defined by the existing soil sampling data that bound the extent of COCs exceeding cleanup levels. Excavation will be completed to the existing "clean" sampling locations. During excavation activities surface water, stormwater, and groundwater, will be managed as necessary. As described in the Engineering Design Report, data will be collected to verify that the lateral limits of excavation have been reached and verification soil samples will be collected from the bottom of the excavations for laboratory analysis. The planned excavation areas are shown on Sheet 2.

Excavated contaminated soils will be transported off-site for disposal at a permitted facility. The remediation areas will be backfilled with clean, imported fill material, to meet the specifications defined in the Engineering Design Report.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

The site is flat and remediated areas will be seeded with an erosion control seed mix, so erosion is unlikely to occur.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

The impervious surfaces for the site will remain the same.

Prior to excavation, a portion of the existing asphalt will be removed from the historical operations area (fenced area) to facilitate removal of the contaminated soil. Any existing asphalt areas that are removed will be replaced after cleanup actions. In addition, it is assumed that some areas/portions of the hangar building (e.g., floor slabs and/or footings) will need to be protected, moved, or demolished during or prior to excavation in the historical operations area and restored following the cleanup action.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Minimal erosion could occur as the result of this project. Given the lack of any appreciable slope at the site, the potential for erosion to occur is small. Work will be done during the dry season so that water is not expected to be a significant issue during construction.

The contractor will develop a SWPPP and implement BMPs (e.g., silt fences, wattles, straw bales, and mulch) to control sediment loss at the site. Cleanup construction will occur in the dry season, when soils are dry and the likelihood of rain is low. At a minimum, a silt fence will be installed around the perimeter of the remediation area to contain any runoff in the unlikely event of rain.

Based on results of shallow groundwater (5 feet bgs) monitoring conducted at the site during the summer, groundwater is not anticipated to be encountered during cleanup actions (removal and replacement of the top 1-2 feet of soil). Should water be encountered within the excavations, the contractor will be required to maintain a dry excavation within reason. Measures such as trenches and sumps may be installed within the construction area to contain water. Stormwater pumped from the trenches will be rerouted from the excavation area or collected and either removed from the site and disposed of according to permit conditions, treated on-site and released south of the remediation area once compliance with groundwater standards is met, or released to a sewer – if allowable.

2. Air

a. What types of emissions to the air would result from this proposal (i.e. dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

The project may generate dust and additional diesel emissions during construction as a result of operating construction equipment at the site. The completed project will not generate air emissions.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

None known

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Diesel exhaust will be managed with residential grade mufflers on construction equipment. Dust will be managed with a watering truck, as needed.

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

A wetland delineation was completed for the site on August 22, 2007 by Hart Crowser, Inc. – Pentec Environmental (Hart Crowser, 2007). Four wetlands were delineated on the site, identified as Wetlands A, B, C, D (see Table 1 below, Sheet 2). The fenced Hangar area contains all of Wetlands B and C and portions of Wetlands A and D. Wetland D extends north of the fenced area and Wetland A extends north, east and south of the fenced area.

TABLE 1. SUMMARY INFORMATION FOR WETLANDS AT THE SITE

Wetland	Cowardin Vegetation Class ¹	Size (square feet)	Wetland Category ²
Wetland A	Forested & Emergent	95,561	III
Wetland B	Scrub-Shrub	303	IV
Wetland C	Emergent	73	IV
Wetland D	Emergent	3,141	IV
TOTAL		53,478	

Notes:

1 – Cowardin vegetation class assigned based on *Classification of Wetland and Deep Water Habitats of the United States* (Cowardin et al 1979), as reported in the Hart Crowser Critical Areas Report (Hart Crowser, 2007).

2 – Wetland Category based on the Washington State Wetland Rating System for Western Washington (Hruby, 2004), as reported in the Hart Crowser Critical Areas Report (Hart Crowser, 2007).

Cowardin LM, Carter V, Golet FC, and LaRoe ET. 1979. *Classification of Wetland and Deep Water Habitats of the United States*. Performed for Office of Biological Services, Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes.

The proposed project will require the excavation and replacement of soils within wetland areas. Approximately 31,464 square feet (0.72 acres) of wetland areas will be temporarily impacted by the proposal (see Table 2 below, Sheet 3). Following remediation, wetland portions of the site will be planted with native wetland vegetation and monitored according to the Updated Wetland Restoration Plan (GeoEngineers, 2011c; Sheet 3).

TABLE 2. PROPOSED WETLAND IMPACTS AND RESTORATION AREAS

Wetland	Cowardin Vegetation Class Impacted	Plant Communities to be Restored	Wetland Impact and Restoration Areas (square feet)
Wetland A	Forested	Tree and shrub	25,519
	Emergent	Grass and emergent	3,897
Wetland B	Scrub-Shrub	Shrub	229
Wetland C	Emergent	Grass and emergent	73
Wetland D	Emergent	Grass and emergent	1,746
TOTAL			31,464

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of the fill material.

See 3(a)(2) above for estimated square footage impacts to wetlands.

Table 3 below presents estimated volumes of soil to be excavated from Wetlands A, B, C and D as part of cleanup actions. An equal amount of clean fill and topsoil will replace the contaminated soils removed from the site. Finished surface grades and topography will approximately match pre-existing conditions.

TABLE 3. ESTIMATED EXCAVATION VOLUMES IN WETLANDS WITHIN THE REMEDIATION AREA

Wetland	Cowardin Vegetation Class Impacted	Current Proposed Volume of Excavation in Wetlands ¹	
		(cubic feet)	(cubic yards)
Wetland A	Forested	30,623	1,134
	Emergent	4,676	173
Wetland B	Scrub-Shrub	275	10
Wetland C	Emergent	88	3
Wetland D	Emergent	2,095	78
TOTAL		37,757	1,398

Notes:

- 1 Proposed volume to be excavated within wetlands was calculated assuming an average remedial excavation depth of 1.2 feet (GeoEngineers, 2011a).

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No

5) Does the proposal lie within a 100 year floodplain? If so, note location on the site plan.

No

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No

b. Ground:

1) Will groundwater be withdrawn, or will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

Groundwater will not be withdrawn at the site.

During construction, measures such as trenches and sumps may be installed within the construction area to contain stormwater. Stormwater pumped from the trenches will be rerouted from the excavation area or collected and either removed from the site and disposed of according to permit condition, treated on-site and released south of the remediation area once compliance with groundwater standards is met, or released to a sewer – if allowable.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . .; agricultural; etc.). Describe the general size of the system, the number such systems, the number of houses to be served (if applicable), or the number animals or humans the system(s) are expected to serve.

None

c. Water Runoff (including storm water):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Surface water runoff flows onto the former Skagit Farmers Supply Site (fenced area) from the north and leaves the area along the east fence line before flowing into the forested wetland area (Wetland A). A shallow ditch along the north side of the Skagit Farmers Supply Site collects rainwater which eventually flows into Wetland A to the southeast via a shallow drainage channel. During the wet season and heavy rains, shallow ponded water accumulates just east of the hangar building. This area receives flow from one of the hangar roof drains and from the southwest corner of the paved area. The roof drains from the southern side of the hangar discharge to shallow channels that flow across the southern margin of the Site toward the adjacent field. The hangar's western roof drain also discharges to a shallow channel toward the southern margin of the Site. The eastern roof discharges to merge with runoff flowing eastward.

Wetland A drains to the south and eventually to a drainage ditch along Runway 04/22, where it flows east towards Taxiway F. This drainage connects to off site wetlands via culverts under Taxiway F and connects to a network of drainage ditches that flow into Indian Slough, which flows to the west and north into Padilla Bay.

The contractor will develop a SWPPP and implement BMPs (e.g., silt fences, wattles, straw bales, and mulch) to control sediment loss at the site. To the extent possible, cleanup construction will occur in the dry season, when soils

are dry and the likelihood of rain is low. At a minimum, a silt fence will be installed around the perimeter of the remediation area to contain any runoff in the unlikely event of rain. Based on results of shallow groundwater (5 feet bgs) monitoring conducted at the site during the summer, groundwater is not anticipated to be encountered during cleanup actions (removal and replacement of the top 1-2 feet of soil). Should water be encountered within the excavations, the contractor will be required to maintain a dry excavation within reason. Measures such as trenches and sumps may be installed within the construction area to contain water. Stormwater pumped from the trenches will be rerouted from the excavation area or collected and either removed from the site and disposed of according to permit conditions, treated on-site and released south of the remediation area once compliance with groundwater standards is met, or released to a sewer – if allowable.

2) Could waste material enter ground or surface waters? If so, generally describe.

No waste materials will be produced from this project. As discussed in Section 3(c)(1), stormwater pumped from the trenches will be rerouted from the excavation area or collected and either removed from the site and disposed of according to permit conditions, treated on-site and released south of the remediation area once compliance with groundwater standards is met, or released to a sewer – if allowable.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

Project will be done in the dry season to the degree possible, and all Best Management Practices will be used.

4. Plants

a. Check/circle/underline types of vegetation found on the site:

- deciduous trees: red alder, big leaf maple, black cottonwood, willow
- evergreen trees: western redcedar
- shrubs: salmonberry, vine maple, Indian plum, swamp gooseberry, hardhack/spirea, red elderberry, Himalayan blackberry
- grasses: reed canarygrass and a variety of native and non-native grasses.
- pasture: non-native grasses
- crop or grain: no
- wet soil plants: soft rush and slough sedge
- water plants: slough sedge
- other types of vegetation: poison-hemlock, sword fern, lady fern, stinging nettle, piggy-back plant, large-leaf avens, trailing blackberry, false lily-of-the-valley

b. What kind and amount of vegetation will be removed or altered?

Forest, shrub, and emergent/grass vegetation will be removed from the cleanup area. Vegetated areas will be restored according to the Updated Wetland Restoration Plan.

c. List threatened or endangered species known to be on or near the site.

None known.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Re-vegetation at the site will include installation of native trees (10-foot-on-center) and shrubs (5-foot-on-center) as well as seeding emergent portions of the impact areas with a native grass/emergent seed mixture. Upland buffer areas will be re-seeded with an erosion control seed mix. More details on re-vegetation are provided in the Updated Wetland Restoration Plan (GeoEngineers, 2011c).

5. Animals

a. Circle/underline any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: redtail hawk, harrier, blue heron, bald eagle, and songbirds

mammals: deer and rodents.

fish: **None.**

b. List any threatened or endangered species known to be on or near the site.

None known.

c. Is the site part of a migration route? If so, explain.

The site is located along the pacific flyway for migrant birds, as is all of coastal Washington State.

d. Proposed measures to preserve or enhance wildlife, if any:

Wetlands serve as important habitat for many species of wildlife. Removal of contaminated soils from within wetlands and replacement with clean topsoil will enhance wildlife habitat. In addition, re-vegetation measures will result in replacement of invasive grasses with native species in emergent habitat areas and replacement of mature conifer trees (western redcedar) will occur at an approximate ratio of 7:1.

6. Energy and Natural Resources

a. What kinds of energy (electrical, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

N/A

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

N/A

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

N/A

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? If so, describe.

Yes, there is some risk of exposure to toxic chemicals. Site soils contain endosulfans in exceedance of MTCA criteria. Endosulfan, a chlorinated pesticide, is the most commonly detected and widely distributed chemical of concern (COC) in Site soils. Endosulfan exceeded Site-specific cleanup levels in 85 percent of all soil samples that had at least one COC exceeding cleanup levels. Other COCs at the site that exceeded preliminary soil cleanup levels include dieldrin, toxaphene, and dinoseb.

If during cleanup actions soils become excessively dry, there is a risk of workers being exposed to chemicals through inhalation of dust.

Shallow groundwater samples were analyzed for endosulfans, chlordanes, aldrin, dieldrin, heptachlor, heptachlor epoxide, toxaphene, total DDT (4,4'-DDD, 4,4'-DDE and 4,4'-DDT), dinoseb, and MCPA. Of nine shallow groundwater wells (approximately 2 to 8 feet below top of casing) sampled in 2009 and 2010, four wells contained cleanup level exceedances as summarized below:

In the historical operations area (fenced area), groundwater samples from GEI-MW-4, GEI-MW-6, and GEI-MW-7 had positive or tentative exceedances of dieldrin, dinoseb, MCPA, bentazon, heptachlor, and/or heptachlor epoxide.

In the area of the drainage channel connecting the historical operations area to Wetland A, groundwater samples from GEI-MW-8 had positive or tentative exceedances of aldrin, dinoseb, MCPA, 2,4-D, and heptachlor epoxide.

Groundwater will likely not be encountered during cleanup actions (based on monitoring well results during the dry season). Stormwater may accumulate on site if heavy rains occur during construction.

The shallow groundwater at the Site is not used as a drinking source.

1) Describe any emergency services that might be required.

None

2) Propose measures to reduce or control environmental health hazards, if any:

Protection monitoring for human health will be conducted during and other construction activities by ensuring that Site workers are appropriately trained in health and safety. Air monitoring will be performed for respirable dust and action levels may be established based on maximum soil pesticides concentrations and permissible exposure levels (PELs). Health and safety and contingency plans for encouraging hazardous materials will also be available prior to and during Site cleanup activities.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

None

2) What types and levels of noise would be created by or associated with the project on a short-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

The project will generate short-term noise during construction due to increased truck traffic and equipment operation. The Site is completely located within the Ports controlled airport area. It is anticipated that construction will occur between the hours of 6:00 am and 7:00 pm daily.

3) Proposed measures to reduce or control noise impacts, if any:

Short-term noise impacts due to construction will be reduced by limiting construction to daylight hours and by requiring mufflers on construction equipment.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

The site is currently used by the Port for storage of maintenance equipment.
The adjacent property is either vacant or used for livestock grazing.

b. Has the site been used for agriculture? If so, describe.

No

c. Describe any structures on the site.

The site contains one existing structure consisting of a 7,800 square foot hangar/storage shed building.

d. Will any structures be demolished? if so, what?

Part if the hangar may need to be demolished to access contaminated soils during cleanup actions.

e. What is the current zoning classification of the site?

Aviation related (AVR)

f. What is the current comprehensive plan designation of the site?

Aviation related (AVR)

g. If applicable, what is the current shoreline master program designation of the site?

N/A

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No

i. Approximately how many people would reside or work in the completed project?

None

j. Approximately how many people would the completed project displace?

None

k. Proposed measures to avoid or reduce displacement impacts, if any:

N/A

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The proposal is consistent with the existing zoning and Airport Master Plan.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle or low-income housing.

N/A

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

N/A

c. Proposed measures to reduce or control housing impacts, if any:

N/A

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

If the hangar or a portion of the hangar is demolished during cleanup actions, it will be re-built but not expanded.

b. What views in the immediate vicinity would be altered or obstructed?

None

c. Proposed measures to reduce or control aesthetic impacts, if any:

N/A

11. Light and Glare

a. What kind of light or glare will the proposal produce? What time of day would it mainly occur?

None

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No

c. What existing off-site sources of light or glare may affect your proposal?

None

d. Proposed measures to reduce or control light and glare impacts, if any:

None

12. Recreation

a. What designated and informal recreation opportunities are in the immediate vicinity?

Bayview State Park, Bayview Bicycle Tour Route, and the Padilla Bay National Estuarine Research Reserve.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No

c. Proposed measures to reduce or control impacts on recreation, including recreational opportunities to be provided by the project or applicant, if any:

No impacts are anticipated and no measures are proposed.

13. Historic and Cultural Preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

There are no places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site.

b. Generally describe any landmarks or evidence of historic, archeological, scientific, or cultural importance known to be on or next to the site? If so, generally describe.

None

c. Proposed measures to reduce or control impacts, if any:

No measures are proposed.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans if any.

None

b. Is the site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

No

c. How many parking spaces would the completed project have? How many would the project eliminate?

N/A

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

N/A

g. Proposed measures to reduce or control transportation impacts, if any:

N/A

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No

b. Proposed measures to reduce or control direct impacts on public services, if any.

N/A

16. Utilities

a. Circle/underline utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

None

C. SIGNATURE

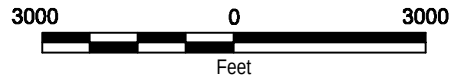
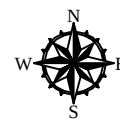
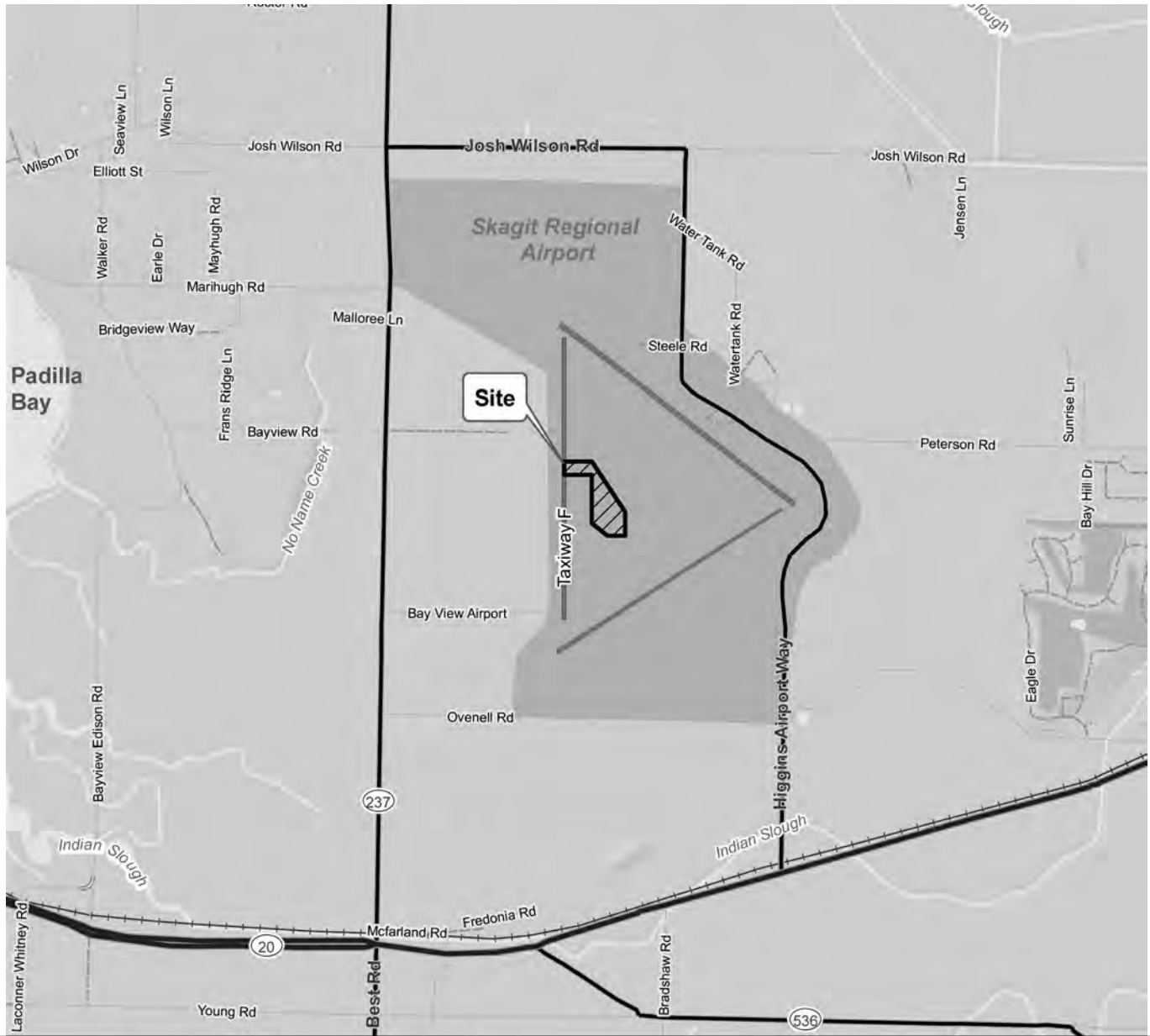
The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.


Signature

3/16/11
Date Submitted

SEC. 4, T34N, R03E, W.M.

LOG.: 48°28'13.85" NORTH - LAT.: 122°25'46.38" WEST



REFERENCE: ESRI DATA & MPAS, STREET MAPS 2005

PURPOSE:

REMOVE CONTAMINATED SOIL,
PLACE BACKFILL AND RESTORE.
REVERIFICATION OF PERMIT
(NWS-2008-19-NO)

ADJACENT PROPERTY OWNERS:

1. PORT OF SKAGIT COUNTY

VICINITY MAP

TAXIWAY F SITE
SKAGIT COUNTY, WA

IN: SKAGIT COUNTY

COUNTY OF: SKAGIT

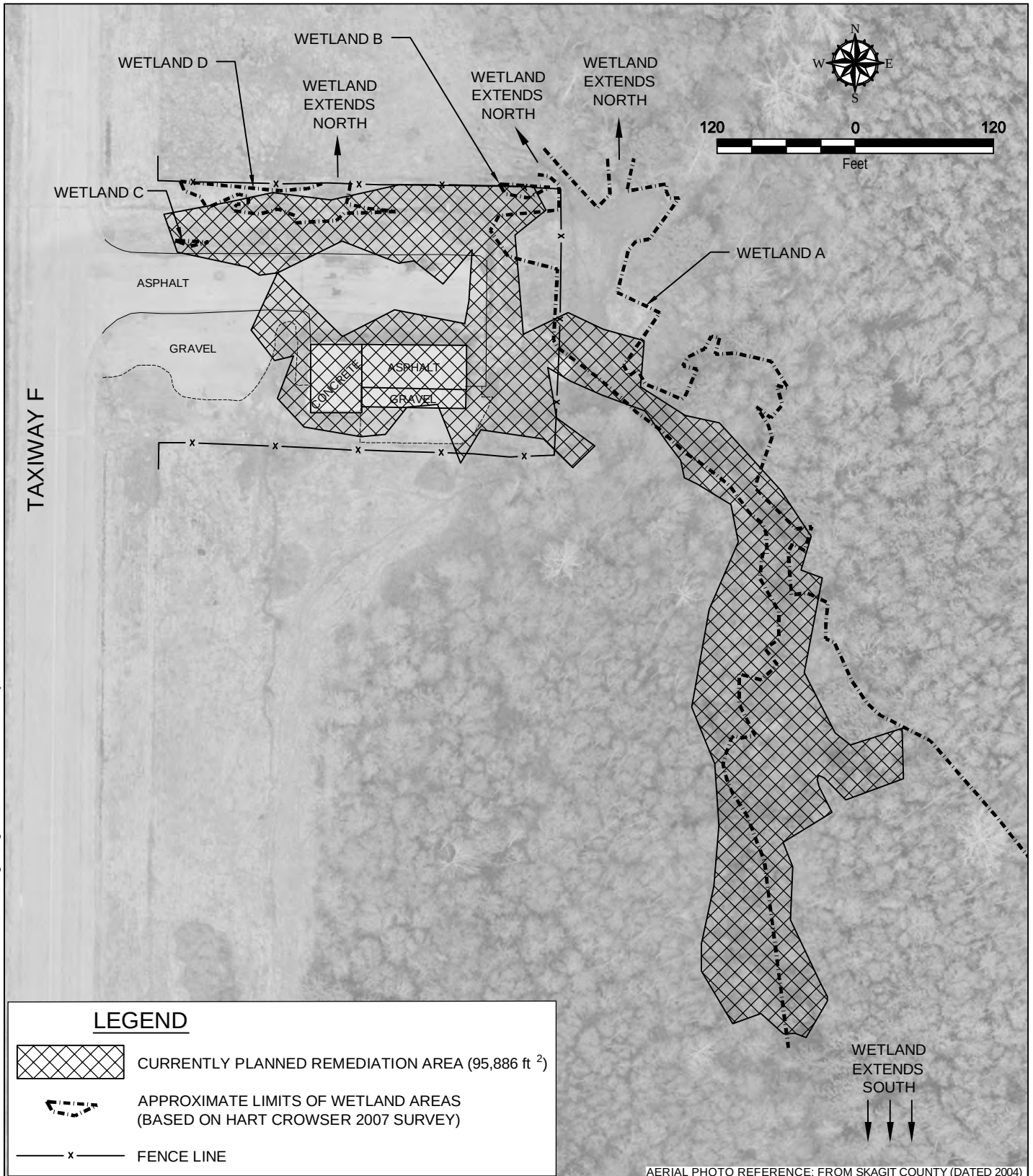
STATE OF: WASHINGTON

APPLICATION BY:
PORT OF SKAGIT COUNTY

SHEET: 1 of 3

DATE: 01/14/11

CREATED BY: GEOENGINEERS, INC.



PURPOSE:

REMOVE CONTAMINATED SOIL,
PLACE BACKFILL AND RESTORE.
REVERIFICATION OF PERMIT
(NWS-2008-19-NO)

ADJACENT PROPERTY OWNERS:

1. PORT OF SKAGIT COUNTY

**SITE PLAN
REMEDATION AREA**

TAXIWAY F SITE
SKAGIT COUNTY, WA

IN: SKAGIT COUNTY

COUNTY OF: SKAGIT

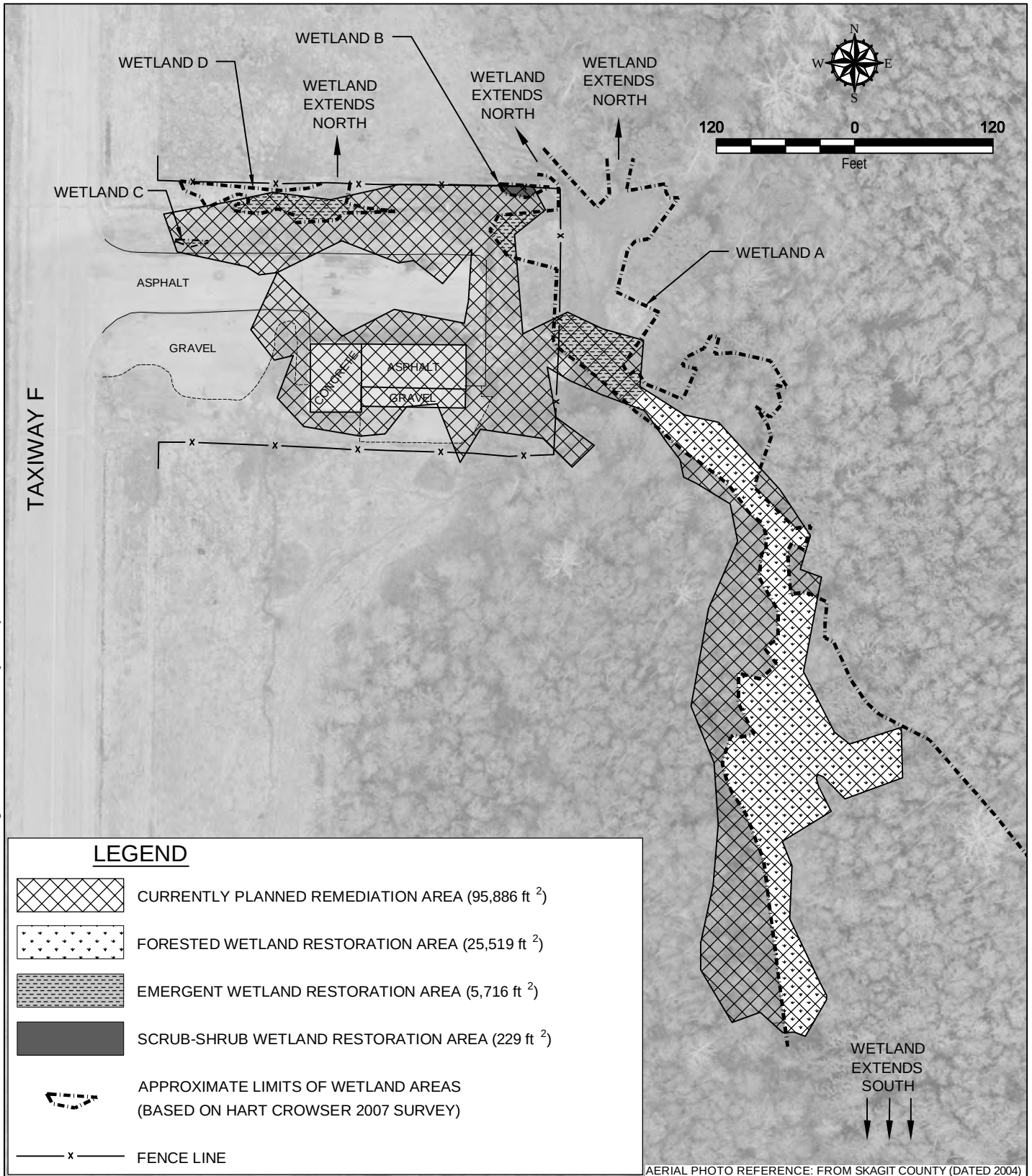
STATE OF: WASHINGTON

APPLICATION BY:
PORT OF SKAGIT COUNTY

SHEET: 2 of 3

DATE: 01/14/11

CREATED BY: GEOENGINEERS, INC.



PURPOSE:

REMOVE CONTAMINATED SOIL,
PLACE BACKFILL AND RESTORE.
REVERIFICATION OF PERMIT
(NWS-2008-19-NO)

ADJACENT PROPERTY OWNERS:

1. PORT OF SKAGIT COUNTY

**SITE PLAN
WETLAND RESTORATION
AREAS**

TAXIWAY F SITE
SKAGIT COUNTY, WA

IN: SKAGIT COUNTY

COUNTY OF: SKAGIT

STATE OF: WASHINGTON

APPLICATION BY:
PORT OF SKAGIT COUNTY

SHEET: 3 of 3

DATE: 01/14/11

CREATED BY: GEOENGINEERS, INC.

WAC 197-11-970

**DETERMINATION OF NONSIGNIFICANCE
TAXIWAY F CLEANUP AT THE SKAGIT REGIONAL AIRPORT**

Description of proposal: The Taxiway F site will be subject to a remedial action as directed by the Department of Ecology. Currently the site is used by the Port of Skagit County for storage of equipment. Remediation will include excavation and disposal of soils at an approved landfill facility. Contamination at the site was delineated as part of the Site Remedial Investigation and Feasibility Study. Site contamination is the result of historical crop dusting operations. The remediation area covers approximately 2.2 acres. Soil will be removed from the top six inches to two feet. Following completion of excavation the Site will be restored in accordance with an approved Wetland Restoration Plan and project permit. Future site use is expected to be consistent with current site use.

Proponent: Port of Skagit County

Location of proposal: Skagit Regional Airport, 15400 Airport Drive, Burlington, WA 98233

Lead agency: Washington State Department of Ecology

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030 (2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

☐ There is no comment period for this DNS.

☐ This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.

☒ This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by the end of the public comment period for the Consent Decree implementing this cleanup action.

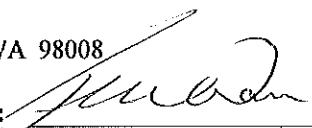
Responsible official: Robert A. Warren

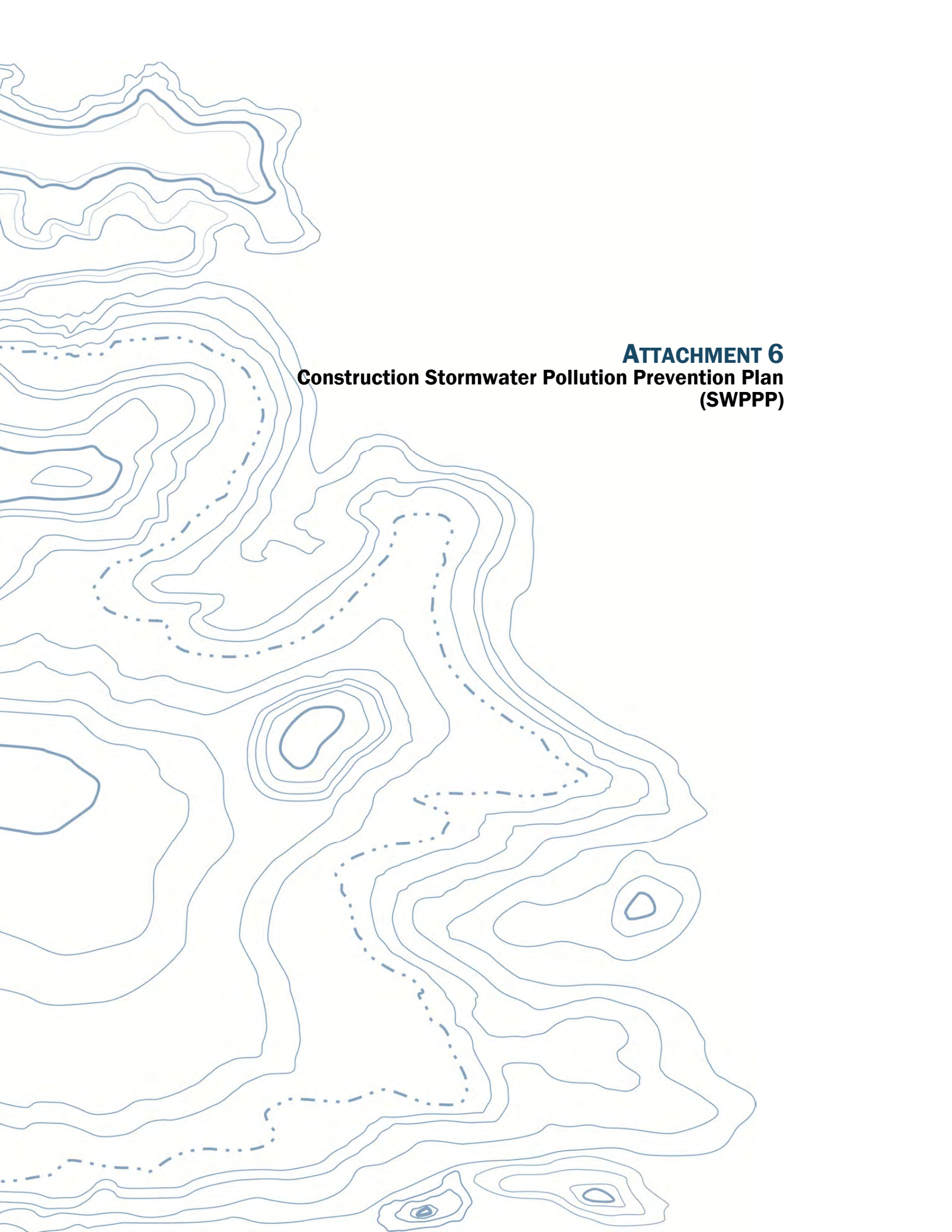
Position/title: Section Manager, Toxics Cleanup Program, Northwest Regional Office **Phone:** 425-649-7054

Address: 3190 160th Avenue SE, Bellevue, WA 98008

Date: April 7, 2011

Signature:


ROBERT W. WARREN
NWRO SECTION MANAGER



ATTACHMENT 6
Construction Stormwater Pollution Prevention Plan
(SWPPP)

CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

For

Port of Skagit County

Prepared For

Washington State Department of Ecology
Northwest Regional Office
3190 - 160th Avenue SE
Bellevue, Washington 98008-5452
425.649.7000

Owner

Port of Skagit County
PO Box 348
Burlington, Washington 98223
Sara Young

Developer

Port of Skagit County
15,400 Airport Drive
Burlington, Washington 98223
Sara Young

Operator/Contractor

To Be Selected by Owner

Project Site Location

Skagit Regional Airport, Burlington Washington
Adjacent to Taxiway F

Certified Erosion and Sediment Control Lead

GeoEngineers, Inc.
600 Dupont Street
Bellingham, Washington 98225
Angela Nelson
CESCL # 360-303-5628

SWPPP Prepared By

GeoEngineers, Inc.
Angela Nelson
360.647.1510

SWPPP Preparation Date

June 20, 2011

Approximate Project Construction Dates

August-October 2011

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APPENDICES

Appendix A. Project Design Plans

Figure A-1 – Overview Site Plan

Figure A-2 – Temporary Erosion and Sediment Control (TESC) Plan

Appendix B. Recommended & Alternative BMPs

Appendix C. Notice of Intent to Ecology for Coverage under the NPDES Construction Construction Stormwater General Permit.

Appendix D. Construction Stormwater General Permit

Appendix E. Construction Stormwater Site Inspection Checklist

Appendix F. Discharge Monitoring Report Form **(to be added if permit holder requests paper submittal)**

Appendix G. Ecology Correspondence **(to be added as project proceeds)**

Appendix H. Copies of Complete DMRs and Construction Stormwater Site Inspection Checklists **(to be added as project proceeds)**

1.0 INTRODUCTION

This Construction Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the Port of Skagit County (Port) for construction activities associated with the Taxiway F Site (Site) Cleanup project. Cleanup at the Site is being completed by the Port under formal order by the Washington Department of Ecology (Ecology). The Site is located at the Skagit Regional Airport, on the east side of Taxiway F, on the western side of the Skagit Regional Airport in Burlington, Washington (Figure 1). The purpose of this SWPPP is to describe the Temporary Erosion Sediment Control (TESC) measures, pollution prevention measures, inspections/monitoring activities, and recordkeeping that will be implemented during the project. This SWPPP was prepared based on the general requirements set forth in the *Ecology Construction Stormwater General Permit* (CSWGP) (Appendix D) and the *Stormwater Management Manual for Western Washington* (SWMMWW) (Ecology, 2005a). This SWPPP satisfies minimum requirements #1 through #5 of the SWMMWW (Ecology, 2005a) as applicable to the planned project.

Management of stormwater at the Site will operate under two different modes: 1) when contaminated soils are present at the Site (e.g., during excavation, handling, or stockpiling activities) or 2) after contaminated soils have been removed from the site (e.g., during site restoration). During the period in which contaminated soils are present and under remediation, efforts will be made to contain stormwater within the remediation area. After the contamination has been removed and the Site is being restored, stormwater will be allowed to leave the remediation area as long as turbid waters do not enter “Waters of the State” (as defined in RCW 90.48.020).

The objectives of the SWPPP are to:

1. Implement Best Management Practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution resulting from construction activity.
2. Prevent violations of surface water quality, groundwater quality, or sediment management standards.
3. Prevent, during the construction phase, adverse water quality impacts including impacts on beneficial uses of the receiving water by controlling peak flow rates and volumes of stormwater runoff at the Permittee's outfalls and downstream of the outfalls.

The report is divided into six main sections with several appendices that include stormwater related reference materials. The topics presented in each of the main sections are:

- **Section 1 – INTRODUCTION AND SITE PROJECT DESCRIPTION.** This section provides a summary description of the project, and describes the organization of the SWPPP document. This section provides a detailed description of the existing site conditions, and proposed construction activities, for existing conditions and post-construction conditions.
- **Section 2 – CONSTRUCTION STORMWATER BMPs.** This section provides a detailed description of the BMPs to be implemented based on the 12 required elements of the SWPPP (Ecology, 2005a). For each element of stormwater pollution prevention there are recommendations of

approved construction management approaches, techniques, materials and installations details. **Recommended and alternative BMPs are presented in Appendix B.**

- **Section 3 – CONSTRUCTION SCHEDULE AND BMP IMPLEMENTATION.** This section provides a description of the timing of the BMP implementation in relation to the project schedule.
- **Section 4 – POLLUTION PREVENTION TEAM.** This section identifies the appropriate contact names (emergency and non-emergency), monitoring personnel, and the on-site Certified Erosion and Sediment Control Lead (CESCL) inspector.
- **Section 5 – SITE INSPECTION AND MONITORING.** This section provides a description of the inspection and monitoring requirements such as the parameters of concern to be monitored, sample locations, sample frequencies, and sampling methods for stormwater discharge locations from the site.
- **Section 6 – REPORTING AND RECORDKEEPING.** This section describes the requirements for documentation of the BMP implementation, site inspections, monitoring results, and changes to the implementation of certain BMPs due to site factors experienced during construction. **Site Inspection Checklist and Discharge Monitoring Report (DMR) forms, which are to be completed during site inspections, can be found in Appendices E and F.**

Supporting documentation and standard forms are provided in the following Appendices:

- Appendix A – Project Design Plans
- Appendix B – Recommended & Alternative BMPs
- Appendix C – Notice of Intent to Ecology for Coverage under the NPDES Construction Stormwater General Permit.
- Appendix D – Construction Stormwater General Permit
- Appendix E – Construction Stormwater Site Inspection Checklist
- Appendix F – Discharge Monitoring Report Form
- Appendix G – Ecology correspondence
- Appendix H – Copies of Complete DMRs and Construction Stormwater Site Inspection Checklists

2.0 SITE PROJECT DESCRIPTION

2.1. Existing Conditions

The Site is on a property classified by Skagit County as Aviation Related (AVR) zoning and is located along the western edge of the Skagit Regional Airport immediately east of Taxiway F (Figure 1 – Vicinity Map). The Site consists of a historical operations area which consists of a fenced area with a hangar, and asphalt/gravel driveway and adjacent upland and wetland areas that are located to the east and south. Between 1978 and 2000, the Port leased the portion of the Site immediately adjacent to Taxiway F to a series of individuals and companies engaged in the business of crop dusting. As part of the former crop dusting operations, pesticides and herbicides were stored in the hangar building and loaded onto crop dusting aircraft for use. In 2000, Port discontinued leasing of the property and equipment and containers of herbicides and pesticides were removed from the Site.

The Port currently uses the hangar building for storage of maintenance of their equipment. The Port has no plans to rezone the property, and does not anticipate any future changes to the current land use (light industrial).

Site topography is generally flat with slopes in the range of 0-3 PERCENT. The property slopes to the east towards offsite wetlands and upland areas. Natural Site features include forested, emergent and scrub/shrub wetlands and upland woodlands and pasture.

Throughout this document the term “project area” refers to the limits of remediation clean-up activities. The term “project site” refers to the parcel boundaries.

2.1.1. Critical Areas

Four wetlands have been identified on the Site (Hart Crower, 2007), they are referred to as Wetlands A, B, C and D (Appendix A: Figure A-1). The historical operations area contains portions of Wetlands A and D, and all of Wetlands B and C. Wetland D extends north of the historical operations area and Wetland A extends north, east and south of the historical operations area. Wetland A is approximately 2.19 acres in size. Wetland B is approximately 0.007 acres in size. Wetland C is approximately 0.002 acres, and Wetland D is approximately 0.09 acres.

Wetland A contains forested and emergent plant communities, Wetland B contains a scrub/shrub plant community, and Wetlands C and D contain emergent plant communities. The Critical Areas Report completed for the Site dated August 22, 2001 describes the characteristics and location of the identified wetlands in detail (Hart Crower, 2007).

2.1.2. Soils and Erosion Potential

Shallow soils at the Site typically consist of 1 to 3 feet of fine to coarse sand and gravel. Clay and silt deposits are present beneath the shallow sand and gravel horizon to depths of approximately 50 to 85 feet below ground surface (bgs). Fine to medium sand deposits with varying amounts of silt and gravel underlie the clay/silt unit to a depth of at least 115 feet bgs (the maximum depth explored at the Site). Published geologic maps for the Site vicinity suggest that much of the material underlying the Site consists of Vashon recessional outwash deposits (poorly sorted sands and gravel, with small amounts of silt and clay; Jones, 1999). Three soil/debris piles are located within, and just outside of, the eastern portion of the historical operations area (Appendix A: Figure A-1). The soil/debris piles appear to consist of soil and plant/organic debris, possibly from past land clearing activities.

2.2. General Construction Activities

Proposed activities generally include shallow excavation of near-surface (1 to 2 feet bgs) soils throughout the project area containing constituents of concern (COCs) concentrations above Site specific cleanup levels. The specific components of the Cleanup Action are outlined in a Draft Cleanup Action Plan (Draft CAP; GeoEngineers, 2011a). The proposed excavation includes removal of soil from the historical operations area, which includes vegetated areas, areas adjacent to and underneath the hangar building, and areas underneath the asphalt/gravel driveway. Excavated asphalt will be replaced with the same amount of new asphalt following completion of construction activities. Soils will also be removed from vegetated upland and wetland areas east and south of historic operation area (approximately 20-170 feet wide and 700 feet long), following the general

areas in and around Wetland A. Volume of contaminated soil estimated to be removed from the Site is 4,300 cubic yards.

Vegetation outside the extent of the excavation will be cleared and grubbed to facilitate access and construction activities. Vegetation clearing limits will be limited to approximately 10 feet around the proposed extent of excavation. Prior to excavation, utilities will be located and removed or protected in place. A portion of the existing asphalt surfacing will be removed from the historical operations area to facilitate removal of contaminated soil. Excavated soil will be temporarily stockpiled on-site and staged for off-site disposal. All of the contaminated soil excavated will be transported off-site for disposal. The excavated areas will be backfilled with clean, imported structural fill or with an appropriate topsoil mix as required by the restoration plans for the Site. Asphalt surfaces removed to access contaminated soil will be restored following the completion of excavation and backfill activities. Disturbed areas will be restored to the approximate pre-construction condition. The vegetated areas of the Site will be restored in accordance with the approved Updated Wetland Restoration Plan (GeoEngineers, 2011b) and the CSWGP (Appendix D).

There are no plans as part of this project for the construction of new buildings or impervious surfaces.

Project work is scheduled to begin in late summer, from approximately mid-August through October. The project duration is anticipated to be six to eight weeks, although may be extended as required to complete the work in a single effort. Necessary best management practices will be implemented to minimize and prevent contaminated stormwater from leaving the project area. Project timing and construction sequencing are two significant parameters that can reduce the potential for contaminated stormwater leaving the project area. Stormwater containment will be achieved through onsite infiltration and the collection of stormwater in depressional areas that will be created during excavation of soils (functioning as sediment traps). Stormwater that collects in the topographic depressions and poses a threat to leaving the project area, rather than infiltrating, will be pumped into temporary tanks at the Site. Based on historic precipitation data, stormwater from average precipitation during the estimated project window is expected to infiltrate into the sandy/gravel soils.

2.2.1. Site Dewatering

The proposed timing for this project is mid-August through October of 2011. Typically these months receive less rainfall than other times of the year. In the event that heavy rains occur during project activities, relevant and if necessary, alternative BMPs will be implemented to collect accumulated surface water within the project area. Water will be directed to shallow sediment traps within the project area and pumped to temporary holding tanks if the collected water develops to a point where discharge from the project area may occur. Collected stormwater runoff will be characterized (chemical concentrations) and approved for either discharge or disposal.

2.3. BMP Elements

This SWPPP is being prepared in accordance with the CSWGP 2010 and the 2005 SWMMWW. Based on the area of land disturbance (approximately 2 acres) and the fact that no new impervious surfaces are being created, minimum requirements #1 through #5 specified in the SWMMWW are applicable to this project.

Since no new buildings and/or structural stormwater facilities are planned, a permanent Stormwater Quality Control Plan is not required. A Temporary Erosion and Sediment Control (TESC) Plan (Appendix A: Figures A-2 and A-3) is included in this SWPPP to satisfy minimum requirement #1 outlined in SWMMWW. The project will comply with the 12 elements of a SWPPP (discussed below), outlined in Special Condition S9.D.1-12 of the CSWGP, including BMPs used to address each element and thereby satisfies minimum requirement #2 outlined in SWMMWW.

2.3.1. Element #1: Mark Construction Limits

To protect adjacent critical areas and to reduce the area of soil exposed during excavation, the limits of construction will be clearly marked before land-disturbing activities begin. Trees that are to be preserved, as well as all sensitive areas and their buffers, will be clearly marked, both in the field and on the plans. Wetlands on the property will be delineated with high visibility fencing before construction activities begin and shown to clearing and grading contractor before those activities commence. In general, outside of the remediation areas, natural vegetation and native topsoil will be retained in an undisturbed state.

BMPS RELEVANT TO MARKING CLEARING LIMITS FOR THIS PROJECT INCLUDE:

- BMP C101: Preserving Natural Vegetation
- BMP C103: High Visibility Plastic Fence

ALTERNATIVE BMPS THAT MAY BE USED FOR THIS PROJECT TO MARK CLEARING LIMITS INCLUDE:

- BMP C233: Silt Fence

Alternate BMPs for marking clearing limits are included in Appendix B as a quick reference tool for the onsite CESCL inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the CSWGP, the Certified Erosion and Sediment Control Lead (CESCL) will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix B after the first indication of existing BMPs failure or ineffectiveness.

2.3.2. Element #2: Establish Construction Access

Project access will be via Taxiway F. There is an existing asphalt driveway that will serve as a construction access (entry and exit). Other access to this site on unpaved areas will be minimized, yet where necessary, access points will be stabilized (using quarry spalls or other relevant material) to minimize the tracking of sediment onto the Taxiway F and roads. Street sweeping and street cleaning will be employed to prevent sediment from being tracked onto the Taxiway F and and/or from entering state waters.

BMPS THAT ARE RELEVANT FOR THIS PROJECT TO ESTABLISH CONSTRUCTION ACCESS INCLUDE:

- BMP C105: Stabilized Construction Entrance
- BMP C107: Construction Road/Parking Area Stabilization
- Sweeping

ALTERNATIVE BMPS THAT MAY BE USED FOR THIS PROJECT TO ESTABLISH CONSTRUCTION ACCESS INCLUDE:

- BMP C122: Wheel Washing

2.3.3. Element #3: Control Flow Rates

The site topography drains to the south via surface flow. Site topography is generally flat with slopes in the range of 0-3 percent. North of the site, a drainage ditch extends along the eastern edge of Taxiway F. Immediately north of the asphalt driveway which leads onto the Site, the ditch makes an approximate ninety degree turn and extends east between the fence line and asphalt driveway. This ditch extends across the northern edge of the site and then flows south through Wetland A via a combination of small drainages and sheet flow. Surface flows in this ditch coming from offsite to the north contribute to saturated soil conditions at the site in the wet season. During construction, off site flows within this ditch will be redirected into the field north of the Site where they will infiltrate into the ground. Surface flows coming onto the Site will be redirected to other adjacent areas. Due to the Site being relatively flat, no concentrated flows are expected to form onsite during the project time period. Sheet flow in the project area will be directed towards and collected within temporary shallow depressions that will be created during excavation activities. Stormwater entering the project area will either infiltrate into the ground or be collected and stored temporarily in storage tanks for later testing. Based on the results of analytical testing stored stormwater will either be directly discharged when conditions allow or treated and discharged should testing indicate unacceptable levels of endosulfan are present.

Southwest of the hangar building, a small drainage swale extends to the south providing drainage for the southwest corner of the Farmer's Supply site (fenced area). This swale will be temporarily blocked with sand bags during remediation activities to prevent stormwater from exiting the project area.

Rainwater falling onto the project area is expected to either infiltrate into the ground or be collected in temporary sediment traps. After contaminated soils have been thoroughly removed from the project area and tested as outlined in the Draft Cleanup Action Plan (Draft CAP; GeoEngineers, 2011a) and Ecology-approved Engineering Design Report, stormwater runoff from the project area will be directed onto adjacent forest and pasture land within the property boundary via small trenches, if needed. The TESC facilities will be upgraded as needed for unexpected storm events and modified to account for changing site conditions.

BMPS THAT ARE RELEVANT FOR CONTROLLING FLOW RATES ON THIS PROJECT INCLUDE:

- BMP C240: Sediment Trap
- BMP C207: Sand Bag Check Dams

ALTERNATIVE BMPS THAT MAY BE USED TO CONTROL FLOW RATES FOR THIS PROJECT INCLUDE:

- BMP C102: Buffer Zones
- BMP C200: Interceptor Swale
- BMP C208: Triangle Silt Dikes

2.3.4. Element #4: Install Sediment Controls

Sediment controls within the project area are necessary to prevent contamination of adjacent areas. Excavation activities during the dry season, project scheduling, construction phasing and emergency preparedness are important factors in pollution prevention. Efforts will be made to ensure that turbid water does not leave the project area. Necessary materials that are readily accessible to address potential stormwater runoff are essential in preventing contamination of adjacent areas in the case of a potential 2-10 year storm event. These materials will be made readily available for the duration of the project. Potential supplies to be kept on-site include pumps and pipe for removing surface waters from the area, tanks for storage of stormwater and ground cover including mulch or straw to protect soils from erosion. The contractor and CESCL inspector may exercise discretion in identifying the materials that may be appropriate depending on site conditions and needs.

In the event that surface waters leave the project area via sheet flow, a series of sediment filters such as Gator Guards or compost wattles will be placed down slope of the immediate excavated area to prevent migration of potentially contaminated water onto the adjacent areas.

Stored stockpiles of contaminated soils will be handled in as described in the Ecology-approved Engineering Design Report.

BMPs THAT ARE RELEVANT FOR SEDIMENT CONTROL ON THIS PROJECT INCLUDE:

- BMP C240: Sediment Trap
- BMP 101: Preserve Natural Vegetation
- BMP 150: Materials On Hand
- BMP C162: Scheduling
- BMP C102: Buffer Zones
- BMP C123: Plastic Covering
- BMP C121 : Mulching
- BMP C124: Seeding

ALTERNATIVE BMPs THAT MAY BE USED FOR SEDIMENT CONTROL ON THIS PROJECT INCLUDE:

- BMP C235: Straw Wattles (Gator Guards, compost filter socks)
- BMP C208: Triangle Silt Dikes

2.3.5. Element #5: Stabilize Soils

In the event of inclement weather, temporary soil stockpiles will be handled as described in the Ecology-approved Engineering Design Report. Dust control measures will be implemented if conditions are dry and there is risk of wind transporting dust from disturbed surfaces onto roadways and critical areas. After completion of the construction activities, an erosion control seed mix, mulch or straw will be placed on exposed soils. Disturbed forest or shrub areas will be mulched and re-vegetated with native plants to serve as permanent erosion control tool.

The remediation areas will be backfilled with clean, imported structural fill or with an appropriate topsoil mix. Asphalt surfaces removed during excavation activities will be restored following the

completion of excavation and backfilling activities. Impacted areas will be restored to match the approximate original topography, features, and surfaces. The Site will be restored in accordance with the approved Updated Wetland Restoration (GeoEngineers, 2011b) plan and the CSWGP (Appendix D). Sufficient quantities of erosion prevention and sediment control materials will be kept on the project site at all times to be used for emergency situations (e.g., unexpected heavy rains) until permanent site stabilization.

BMPS THAT ARE RELEVANT FOR STABILIZING SOILS ON THIS PROJECT INCLUDE:

- BMP C140: Dust Control
- BMP C121: Mulching
- BMP C123: Plastic Covering
- BMP C120: Temporary and Permanent Seeding
- BMP C150: Materials on Hand

ALTERNATIVE BMPS THAT MAY BE USED FOR THIS PROJECT TO STABILIZE SOILS INCLUDE:

- BMP C124: Sodding
- BMP C122: Nets and Blankets

2.3.6. Element #6: Protect Slopes

The topography of the site is generally flat with slopes from ranging up to approximately 3 percent grade. During excavation, no steep slopes are anticipated as the maximum depth of excavation is not expected to be greater than 2 feet bgs. The excavation area will be graded to match existing slopes. Erosional processes related to increased velocity and decreased infiltration along slopes is not anticipated for this project.

2.3.7. Element #7: Protect Drain Inlets

There are no drain inlets within the project work area and no proposed drainage inlets. Low areas around the project area that lead to drainage swales will be blocked with sand bags during remediation activities (see Section 2.3.8).

2.3.8. Element #8: Stabilize Channels and Outlets

North of the project area, a drainage ditch extends along the eastern edge of Taxiway F. Immediately north of the asphalt driveway which leads onto the Site, the ditch makes an approximate ninety degree turn and extends east between the fence line and asphalt driveway. This ditch extends across the northern edge of the site and then flows south through Wetland A via a combination of small drainages and sheet flow. Surface flows in this ditch coming from offsite to the north contribute to saturated soil conditions at the site in the wet season. During construction, off site flows within this ditch will be blocked with sand bags and redirected into the field north of the Site where they will infiltrate into the ground. Surface flows coming onto the Site will be redirected to other adjacent areas. The portion of this small swale/ditch on the property will be excavated during remediation activities. Due to generally flat topography of the site, no concentrated flows are expected to form onsite during the anticipated project time period.

A small drainage swale that originates at the fence line southwest of the Hangar building provides drainage for the southwest corner of the fenced area of the project. This swale will be temporarily blocked with sand bags during remediation activities. The low areas around the project area that lead to drainage swales will be blocked with sand bags before remediation activities begin during remediation activities. These measures are considered to satisfy the minimum requirement #4 outlined in SWMMWW for preservation of natural drainage systems and outfalls.

BMPS THAT ARE RELEVANT FOR STABILIZING CHANNELS AND OUTLETS ON THIS PROJECT INCLUDE:

- BMP C207: Sand Bag Check Dam
- BMP C200: Interceptor Swale
- BMP: Sand Bag Dam

ALTERNATIVE BMPS THAT MAY BE APPLIED FOR THIS PROJECT TO STABILIZE CHANNELS AND OUTLETS INCLUDE:

- BMP C122: Nets and Blankets
- BMP 208: Triangle Silt Dike

2.3.9. Element #9: Control Pollutants

Petroleum products contained in tanks, generators, pumps, etc. will be double-contained to prevent any spills. Construction equipment and vehicles will be properly maintained to prevent fluid leaks. Vehicle maintenance or fueling will be performed off site at an appropriate facility or on site at a designated equipment staging area that is secured and maintained. Vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any spills and to prevent leaks. The fueling of construction vehicles and equipment will be conducted by a fueling service and/or from a fuel tank located on a contractor vehicle. In order to perform emergency repairs on site, temporary plastic may be placed beneath the vehicle to prevent contamination.

Chemicals stored in the construction areas will conform to the appropriate source control BMPs listed in Volume IV of the SWMMWW (Ecology, 2005b). In western Washington, chemicals will have cover, containment, and protection provided on site per BMP C153 for Material Delivery, Storage and Containment (Ecology, 2005b).

A spill response kit will be located near the fueling area for rapid and easy access. Equipment leaks from fuel tanks, equipment seal, or hydraulic lines will be contained within a spill pad placed beneath potential leak sources. The spill response kit will include plastic sheeting, tarps, over pack drums, sorbent pads, kitty litter, and shovels. The contractor will be prepared to excavate and remove impacted soil if a spill occurs. Heavy equipment will be locked at the end of each work day. Material that is incidentally tracked onto Taxiway F will be swept up immediately.

The contractor will provide and maintain temporary toilet facilities during construction to accommodate workers. These facilities will be self-contained with no discharge. Waste removed from these facilities will be disposed off site. Portable sanitation facilities will be firmly secured, regularly maintained, and emptied when necessary.

Dust released from construction activities will be controlled using Dust Control measures (BMP C140).

Contaminated soil will be excavated, temporarily stockpiled on site, and removed from the Site for disposal. Stored stockpiles of contaminated soils will be handled as described in the Ecology-approved Engineering Design Report. Effort will be made to contain stormwater within the project area to prevent COCs from spreading to areas adjacent to the project area. BMPs listed in Elements 1 through 12 of this SWPPP with a focus on erosion and sediment control address measures to prevent the migration of pollution from the project area. These measures will satisfy the minimum requirement #3 outlined in SWMMWW for source control of pollution at the Site.

BMPs THAT ARE RELEVANT FOR THE CONTROL OF POLLUTANTS AT THE PROJECT SITE INCLUDE:

- BMP C153: Material Delivery, Storage and Containment
- BMP C140: Dust Control

2.3.10. Element #10: Control Dewatering

Dewatering activities within the project include removal of ponded surface waters from depressional areas and sediment traps. In the event these areas appear to be insufficient to contain stormwater in the project area, stormwater will be pumped into temporary storage tanks. When conditions allow, the stored water will be tested for release and treatment will be applied, if necessary before being disposed and/or released to vegetated areas south and west of the project area but within the project site. Stored water that is tested to be clean is expected to infiltrate into the ground. No surface water bodies are present within the site. During the dry season, groundwater levels at the Site are expected to be well below excavation elevations and are not anticipated to contribute to dewatering efforts. Appropriate pumping methods are to be determined by the Contractor depending on site conditions and needs.

BMPs THAT ARE RELEVANT FOR CONTROL DEWATERING ON THIS PROJECT INCLUDE:

- BMP C240: Sediment Trap
- BMP C251: Construction Stormwater Filtration
- Infiltration

ALTERNATIVE BMPs THAT MAY BE APPLIED FOR THIS PROJECT FOR CONTROL DEWATERING INCLUDE:

- BMP C250: Construction Stormwater Chemical Treatment

2.3.11. Element #11: Maintain BMPs

Temporary and permanent erosion and sediment control BMPs will be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair will be conducted in accordance with each particular BMP's specifications. Visual monitoring of the BMPs will be conducted at least once every calendar week and within 24 hours of any rainfall event that causes a discharge from the site. If the site becomes inactive, and is temporarily stabilized, the inspection frequency will be reduced to once every month.

Temporary erosion and sediment control BMPs will be removed within 30 days after the final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment resulting from remediation activities will be handled in a manner consistent with other remediated

soils from the project area. Disturbed soil resulting from removal of BMPs or vegetation will be permanently stabilized.

BMPs THAT ARE RELEVANT FOR MAINTAINING BMPs ON THIS PROJECT INCLUDE:

- BMP C150: Materials on Hand
- BMP C160: Certified Erosion and Sediment Control Lead

2.3.12. Element #12: Project Management

Engaged project management of TESC BMPs and clear, effective communication with the construction project manager by the CESCL is imperative to successful implementation of this SWPPP. The CESCL will be on Site weekly or more often, as required, to ensure proper implementation of BMP's and handling of contaminated stormwater.

A preconstruction meeting to go over the SWPPP and TESC Plan will be scheduled prior to beginning excavation and remediation activities. A pre-construction site visit will be scheduled prior to beginning of the project. During the site visit the Contractor, the CESCL and a representative from the project design team will walk the site, delineate the project area boundary, identify trees to be conserved and flag sensitive areas.

Temporary erosion and sediment control BMPs for this construction project have been designed based on the following principles:

- Design the project to fit the existing topography, soils and drainage patterns.
- Minimize the extent and duration of the area exposed.
- Divert flows from entering the project area.
- Minimize runoff.
- Retain sediment on site within the project area.
- Thoroughly monitor site and maintain erosion and sediment control measures.
- Schedule major earthwork during the dry season.

Because this project site is located west of the Cascade Mountain Crest, the project will be managed according to the key project components discussed below in Sections 2.3.13 to 2.3.15.

2.3.13. Phasing of Construction: Seasonal Work Limitations

The construction project is being phased to minimize the potential for soil erosion and the transport of sediment from the site during construction. To that end, the project will be scheduled, to minimize excavation and contaminated soil handling within the wet season (October 1 through April 30), as defined by the SWMMWW (Ecology, 2005a). It is impracticable to stop work due to a change in season and still maintain Ecology's schedule for completion of the cleanup activities at the site. Schedule delays or other unforeseen factors may require that the excavation and handling of contaminated soil occur within the wet season. In this case the work will be conducted to maintain the intent of the BMPs outlined in this SWPPP and conditions of the CSWGP. The remaining site activities, those that are not associated with excavation and handling of contaminated soil, such as

grading, planting, and other soil disturbing activities are likely to occur within the wet season (October 1 through April 30), and will be completed in a manner that maintains the conditions of the CSWGP.

The following activities are exempt from the seasonal clearing and grading limitations:

- Routine maintenance and necessary repair of erosion and sediment control BMPs;
- Routine maintenance of public facilities or existing utility structures that do not expose the soil or result in the removal of the vegetative cover to soil; and
- Activities where there is 100 percent infiltration of surface water runoff within the site in approved and installed erosion and sediment control facilities.

2.3.14. BMPs Inspection and Monitoring

BMPs will be inspected, maintained, and repaired, as needed, to ensure continued performance of their intended functions as described in Sections 4.0 and 5.1. Site inspections will be conducted by the CESCL who will be available either during hours of operation and/or on-call basis. The name and contact information for the CESCL is provided in Section 4.2 of this SWPPP.

The CESCL has the necessary skills to:

- Assess the site conditions and construction activities that could impact the quality of stormwater, and
- Assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

More appropriate BMPs or design changes will be implemented as soon as possible whenever inspection and/or monitoring reveals that the BMPs identified in this SWPPP are inadequate because of an actual discharge event or potential for a discharge event of environmental pollutants.

BMPS THAT ARE RELEVANT FOR MANAGING THE PROJECT INCLUDE:

- BMP C160: Certified Erosion and Sediment Control Lead

2.3.15. Maintaining this SWPPP

Minor changes in the field during construction will be reflected in revisions to the project SWPPP. Site maps (sheet size: 11" x 17") will be provided to the Contractor and CESCL for mark up of changes to the TESC Plan as they are made in the field.

- This SWPPP will be retained on-site and used as the Site Log Book.
- The SWPPP will be modified whenever there is a change in the 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.
- The SWPPP will be modified 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 ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The SWPPP will be modified as necessary to include additional or modified BMPs designed

to correct problems identified. Revisions to the SWPPP will be completed within seven (7) days following the inspection

2.4. Additional BMPs

The TESC Plan (Appendix A: Figure A-2) shows some of the recommended BMPs to be employed during construction. Alternative BMPs that may be deployed are contained in Appendix B. BMPs outlined in the 12 elements of this SWPPP will be considered for implementation by the Contractor.

- A Certified Erosion and Sediment Control Lead will be on site or on-call at all times.
- Whenever inspection and/or monitoring reveals that the BMPs identified in this SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of pollutants, appropriate BMPs or design changes will be implemented as soon as possible.

3.0 CONSTRUCTION SCHEDULE AND BMP IMPLEMENTATION

The BMP implementation schedule is driven by the construction schedule. The project is scheduled to be constructed in late summer of 2011 (mid-August through October). The following provides a sequential list of the preliminary proposed construction schedule milestones and the corresponding BMP implementation schedule. A construction schedule will be provided by the Contractor after the pre-construction meeting.

The project site is located west of the Cascade Mountain Crest. As such, the dry season is considered to be from May 1 to September 30 and the wet season is considered to be from October 1 to April 30.

Estimated start date of Construction: Approximately August 15, 2011

Estimated finish date of Construction: Approximately October 31, 2011

It is impracticable to stop work due to a change in season and still maintain Ecology's schedule for completion of the cleanup activities at the Site. Schedule delays or other unforeseen factors may require that the excavation and handling of contaminated soil occur within the wet season. In this case the work will be conducted to maintain the intent of the BMPs outlined in this SWPPP and conditions of the CSWGP.

An estimated construction sequence is provided below:

- Mobilize equipment and materials to the site:
 - Mobilize and store TESC and soil stabilization products (Appendix B - BMP C150: Materials on Hand)
- Install TESC measures
 - Mark clearing limits
 - Install high visibility fence to mark limits of excavation areas
 - Install silt fence and/or straw wattles as applicable for sediment control
 - Install stabilized construction entrance and access routes. There is an existing asphalt driveway that can be utilized as a construction exit, any additional access will need to be stabilized.

- Block drainages from flowing onto the site and divert flows to adjacent vegetated areas.
- Low areas around the project area that lead to drainage swales will be blocked with sand bags before remediation activities begin during remediation activities.
- Have materials readily available including pumps, storage tanks and erosion control ground cover.
- Begin remediation in locations around the hanger and asphalt driveways and work toward the lower wetland and surrounding areas, to the extent allowable by the project area access and work flow conditions.
- Implement testing as outlined in the Draft Cleanup Action Plan (GeoEngineers, 2011a) and Ecology-approved Engineering Design Report.
- If stormwater is collected in tanks, then obtain water samples and test for endosulfan and Turbidity.
- If contaminants are detected, do not discharge the water from tanks until treated and further testing verifies no detection of COCs in the effluent.
- If excavation of soils within the project area is conducted in phases, once contaminated soils have been removed from a portion of the project area and site soils within that area have met cleanup criteria outlined in the Draft Cleanup Action Plan (Draft CAP, GeoEngineers, 2011a) and Ecology-approved Engineering Design Report, if needed, direct runoff from that area into adjacent forest and pasture land within the project site via small trenches.
- Once contaminated soil removal has been verified as completed from analytical testing results of soils, cease testing for endosulfan in stormwater and collecting stormwater and storing in tanks. Begin diverting stormwater flows from the excavated area to vegetated buffer zones around the project area.
- Stabilize and restore the project area
 - Implement soil stabilization and sediment control BMPs throughout the project area
 - Remediation areas will be backfilled with clean, imported structural fill or with an appropriate topsoil mix as required. Asphalt surfaces removed to access contaminated soil will be restored following the completion of excavation and backfilling activities.
 - Monitor and remove erosion control BMPs that are no longer necessary
- Complete full revegetation plan – including Updated Wetland Restoration Plan and monitoring (GeoEngineers, 2011b).
 - Implement permanent erosion control measures, final landscaping and planting

Therefore, the construction SWPPP elements #1 through #12 coupled with efficient construction scheduling and phasing and implementation of additional BMPs on as-needed basis will work together to satisfy the minimum requirement #5 outlined in SWMMWW for managing stormwater on-site.

4.0 POLLUTION PREVENTION TEAM

4.1. Roles and Responsibilities

The pollution prevention team consists of personnel responsible for implementation of the SWPPP, including the following:

- Certified Erosion and Sediment Control Lead (CESCL) – primary contractor contact, responsible for site inspections (BMPs, visual monitoring, sampling, recording, etc.); to be called upon in case of failure of any erosion and sediment control (ESC) measures.
- Resident Engineer – For projects with engineered structures only (sediment ponds/traps, sand filters, etc.): site representative for the owner that is the project's supervising engineer responsible for inspections and issuing instructions and drawings to the contractor's site supervisor or representative.
- Emergency Ecology Contact – individual to be contacted at Ecology in case of an emergency.
- Emergency Owner Contact – individual that is the site owner or representative of the site owner to be contacted in the case of an emergency.
- Non-Emergency Ecology Contact – individual to be contacted at Ecology in non-emergency situations.
- Monitoring Personnel – personnel responsible for conducting water quality monitoring. For this site one of the monitoring personnel is also the CESCL.

4.2. Team Members

Names and contact information for those identified as members of the pollution prevention team are provided in the following table.

TABLE 4-1. POLLUTION PREVENTION TEAM MEMBERS

Title	Agency/Company	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	GeoEngineers, Inc	Angela Nelson	360.303.5628
Resident Engineer	GeoEngineers, Inc	John Herzog	206.329.3252
Emergency Ecology Contact	Ecology	NW Regional Office ¹	425.649.7000
Non-Emergency Ecology Contact	Ecology	Kurt Baumgarten	360.715.5210
Emergency Owner Contact	Port of Skagit County	Sara Young	360.757.0011
Monitoring Personnel	GeoEngineers, Inc	Angela Nelson Amanda Fickeisen	360.303.5628 360.441.2961

Notes:

¹ All spills of hazardous materials and/or oil must be reported immediately by the spiller.

Call these two numbers:

Washington Emergency Management Division: 1-800-OILS-911

National Response Center: 1-800-424-8802

5.0 SITE INSPECTION AND MONITORING

Site inspections and stormwater monitoring will comply with Section S3.A of the Construction Stormwater General Permit (Appendix D), “Stormwater discharges must not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), groundwater 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 not in compliance with these standards are not authorized.

Ecology presumes that a Permittee complies with water quality standards 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 complies with the following conditions. The permittee must fully:

1. Comply with the permit conditions, including planning, sampling, monitoring, reporting, and recordkeeping conditions.
2. Implement 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.

Stormwater monitoring includes visual inspections of construction activities and BMPs, monitoring for water quality parameters of concern and documentation of the inspection and monitoring findings in a Site Log Book. The Site Log Book will be maintained for on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements,
- Site inspection notes, monitoring forms and associated Site Inspection Checklist, and
- DMRs.

For convenience, the inspection form and water quality monitoring forms (Appendices E and F) included in this SWPPP include the required information for the Site Log Book.

A report of inspections, including the name and qualifications of the CESCL inspector, date of inspection, observations and required actions will be prepared and retained in the project files as part of the SWPPP for at least three years from the date the site is finally stabilized. The report will include any incidents of non-compliance or, if none occurred, will contain certification that the project is in compliance. Inspection reports will be maintained on site with the SWPPP.

5.1. Site Inspection

BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. The inspector will be a CESCL per BMP C160 (Appendix B). The name and contact information for the CESCL is provided in Section 4.2 of this SWPPP.

Site inspection will occur in areas disturbed by construction activities. Stormwater will be monitored per requirements in Section S3 of the Construction Stormwater General Permit (Appendix D). In addition, stormwater samples will be collected and tested for endosulfan and meet requirements of

Section S3.A of the CSWGP (Appendix D), “Discharges must not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), groundwater 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 not in compliance with these standards are not authorized.

Stormwater that is pumped into temporary storage tanks, will be sampled and tested for Site COCs (endosulfans). Stormwater will not be discharged and/or released until no detection of COCs is verified. The site CESCL inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair, replace or add any of the BMPs to improve the quality of stormwater discharges. Maintenance, repairs and additions will be documented in the Site Log Book. New BMPs or design changes will be documented in the SWPPP as soon as possible.

5.1.1. Site Inspection Frequency

For the duration of the remediation activities, site inspections will be conducted weekly or within 24 hours of a rain event (during business hours) to ensure that excavation activities are complying with turbidity criteria. A Department of Ecology Site Inspection Checklist will be filled out weekly and stored in Appendix H of the SWPPP. Recommendations for changes or improvements noted on the inspection checklist will be implemented within seven days of the site visit.

5.1.2. Site Inspection Documentation

Monitoring personnel will record results of site inspections each week on the approved Construction Stormwater Site Inspection Checklist (Appendix E). Copies of completed Site Inspection Checklists and Monitoring Data Sheets will be kept in Appendix H.

5.2. Stormwater Quality Monitoring

Stormwater at the Taxiway F site will be monitored for turbidity and endosulfan per requirements in Section S3 of the CSWGP prior to discharge and/or release to the areas adjacent to the project area. Turbidity monitoring will be performed with a turbidity meter on site or within 48 hours of collection. Endosulfan will be tested in a lab that meets certification set forth by the Department of Ecology. Sample bottles for storing stormwater for endosulfan testing will consist of 2 1-liter amber bottles for each test. Samples need to be tested within seven days. No preservative is required for the sample bottle.

5.2.1. Stormwater Management During Remediation

The benchmark value for stormwater is at or below 25 Nephelometric Turbidity Units (NTUs) before stormwater is allowed to be discharged from the project area or storage tanks. The water quality standard for endosulfan is 0.22 µg/L. Efforts will be made for discharges from the project area to be in compliance with the 2010 CSWGP (Appendix D). Discharges must not cause, or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), groundwater 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 not in compliance with these standards are not authorized.

If the 25 NTU benchmark is exceeded in any sample collected from discharging stormwater the following steps will be conducted:

- Ensure the BMPs specified in this SWPPP are installed and functioning as intended.
- Notify Ecology by phone within 24 hours of analysis (see Section 4.2 of this SWPPP for contact information).
- Assess whether additional BMPs should be implemented, and document modified BMPs in the SWPPP as necessary.
- Sample discharge daily until the discharge is 25 NTU or lower.

If the turbidity exceeds 250 NTU at any time, the following steps will be conducted:

- Notify Ecology by phone within 24 hours of analysis (see Section 4.2 of this SWPPP for contact information).
- Continue sampling daily until the discharge is 25 NTU or lower. Initiate additional treatment BMPs such as off-site treatment, infiltration, filtration and chemical treatment within 24 hours, and implement those additional treatment BMPs as soon as possible, but within a minimum of 7 days.
- Describe inspection results and remedial actions taken in the Site Log Book and in monthly DMRs as described in Section 6.0 of this SWPPP.

5.2.2. Endosulfan

If endosulfan readings from stored water in tanks exceed the 0.22 µg/l criteria the following steps will be taken:

- Initiate treatment BMPs such as off-site treatment, filtration or chemical treatment to meet required stormwater criteria before discharging.
- Describe inspection and testing results and remedial actions taken on the Construction Stormwater Site Inspection Checklist. Add testing information in monthly Discharge Monitoring Reports (Appendix F) as described in Section 6.0 of this SWPPP.
- If visual inspection suggests that turbid water is pooling in a location that may discharge from the project area, immediately initiate action to contain the water in the project area and pump into storage tanks. If stormwater does leave the project area, block and contain the discharge and collect stormwater samples for testing.
- Keep records of samples and sample location in Appendix H of the Site Log Book.

5.2.3. pH

No concrete paving is anticipated for this project so monitoring of pH will not occur as part of CESCL inspections.

5.2.4. Stormwater Management Post Remediation

On completion of the contaminated soil excavation, surface flows from the clean backfill and excavation areas may be allowed to leave the project area. Vegetated land surrounding the project

area will act a buffering filter strip where turbid water will infiltrate into the ground before leaving the Site (parcel) boundaries and before entering Waters of the State (as defined in RCW 90.48.020) which are located offsite. Turbidity readings will be conducted at the established discharge points from the parcel boundaries at least once per calendar week when stormwater is flowing into a water of the state. If there are no discharges into Waters of the State, the attempt to sample will be recorded in the site log book and reported to Ecology in the monthly Discharge Monitoring Report (DMR) as “No Discharge”.

If excavation of soils within the project area is conducted in phases, once contaminated soils have been removed from a portion of the project area and site soils within that area have met cleanup criteria (GeoEngineers, 2011a), if needed, runoff from that area (“clean” area) can be directed onto adjacent forest and pasture land within the project site via small trenches. Endosulfan testing of stormwater from these “clean” areas will not be required.

Inspection results and remedial actions taken will be described in the Site Log Book and in monthly DMRs as described in Section 6.0 of this SWPPP.

6.0 REPORTING AND RECORDKEEPING

6.1. Recordkeeping

Monitoring includes visual inspection, measurement of water quality parameters of concern and documentation of the inspection and monitoring findings within the Site Inspection Checklist (Appendix E). Forms will be completed during each site visit and will serve as the SWPPP record of observation and inspection. Results of turbidity readings and chemical tests will be reported on Site Inspection Checklist. A monthly DMR (Appendix E) will be submitted to Ecology, as detailed in Section 6.4.1.

A Site Log Book will be maintained for on-site construction activities and will include:

- Construction Stormwater Site Inspection Checklists,
- Monthly Discharge Monitoring Reports, and
- Records of any changes to the SWPPP.

Records of monitoring information (Construction Stormwater Site Inspection Checklist, photos, etc.) and this SWPPP will be retained during the life of the project and for a minimum of three years following the completion of construction activities.

6.2. Updating the SWPPP

This SWPPP will be modified if recommended methods are ineffective in eliminating or significantly minimizing stormwater discharges from the project areas or there has been a change in design, construction, operation, or maintenance at the site that has a significant effect on the discharge, or potential for discharge, of pollutants outside of the Taxiway F project area. The SWPPP will be modified within seven days of determination based on inspection(s) that additional or modified BMPs are necessary to correct problems identified, and an updated timeline for BMP implementation will be prepared.

6.3. Access to Plans and Records

The SWPPP, CSWGP, Notice of Authorization letter, and Site Log Book will be retained onsite or within reasonable access to the site and will be made immediately available upon request to Ecology or the local jurisdiction. A copy of this SWPPP will be provided to Ecology within 14 days of receipt of a written request for the SWPPP from Ecology. Any other information requested by Ecology will be submitted within a reasonable time. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with Section S5.G of the CSWGP (Appendix D).

6.4. Reporting

The construction site is greater than 1 acre in size, and is therefore subject to the general water quality monitoring and reporting requirements set forth in the CSWGP (Appendix D).

The site does not discharge to a water body listed as impaired under Section 303(d) of the Clean Water Act, and therefore discharges from the project site are not subject to specific water quality requirements listed under Section 303(d) <http://apps.ecy.wa.gov/wqawa2008/viewer.htm>. (<http://www.ecy.wa.gov/programs/wq/stormwater/construction/impaired.html#snohomish>).

6.4.1. Discharge Monitoring Reports

DMRs will be submitted to Ecology electronically using Ecology's WebDMR program 15 days following the end of each month (<http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html>). If the CESCL/contractor/owner is unable to submit electronically they will contact Ecology to request a waiver and obtain instructions on how to obtain a paper copy DMR. Water quality sampling results (turbidity meter) will be submitted to Ecology monthly with the DMR in accordance with permit condition S5.B (Ecology, 2005b). If no discharge occurs during a given monitoring period, DMRs will be submitted with the words "no discharge" entered in place of the monitoring results. If a benchmark was exceeded, a brief summary of inspection results and remedial actions taken will be included. If sampling could not be performed during a monitoring period, a DMR will be submitted with an explanation of why sampling could not be performed.

6.4.2. Notification of Noncompliance

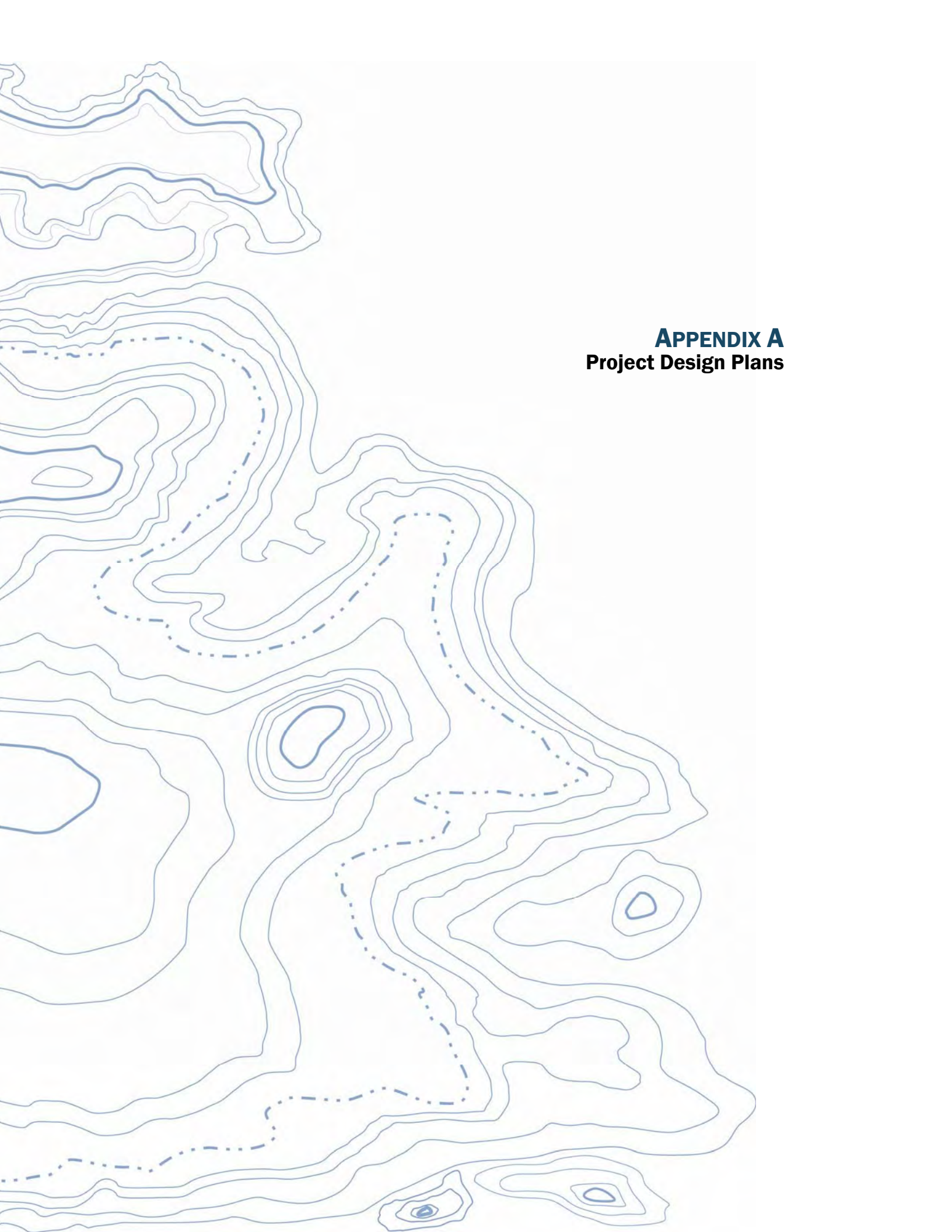
- If any of the terms and conditions of the permit are not met, and it causes a threat to human health or the environment, the following steps will be taken in accordance with Section S5.F of the CSWGP (Appendix D). Ecology will be notified immediately of the failure to comply.
- Immediate action will be taken to control the noncompliance issue and to correct the problem. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
- A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

6.4.3. Permit Applications and Changes

In accordance with Condition S2.A of the CSWGP (Appendix D), a complete Notice of Intent application will be submitted to Ecology and the appropriate local jurisdiction (if applicable) to be covered by the CSWGP.

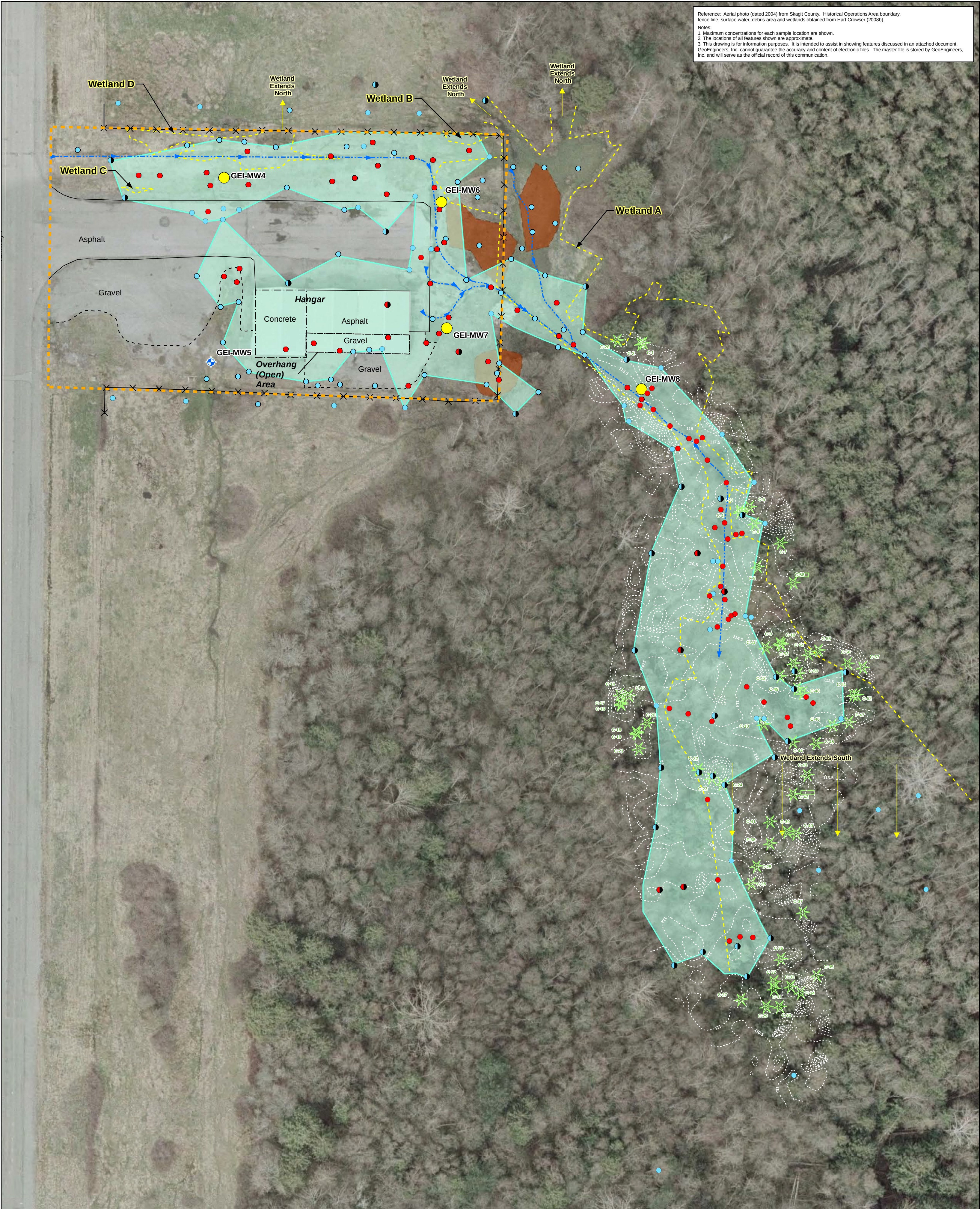
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- Hart Crowser, Inc. 2007. Wetland Restoration Plan Port of Skagit County Farmers Supply/Tronsdale Site. Skagit County, Washington.
- Jones, M.A., 1999, Geological Framework for The Puget Sound Aquifer System, Washington and British Columbia, USGS, Professional Paper 1424-C, plate 8.



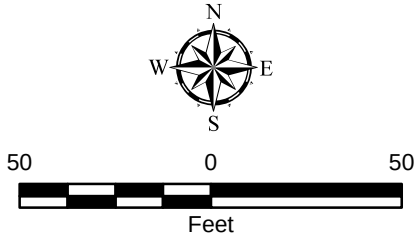
APPENDIX A
Project Design Plans

Reference: Aerial photo (dated 2004) from Skagit County. Historical Operations Area boundary, fence line, surface water, debris area and wetlands obtained from Hart Crowder (2008b).
Notes:
1. Maximum concentrations for each sample location are shown.
2. The locations of all features shown are approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document.
GeoEngineers, Inc. cannot 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.

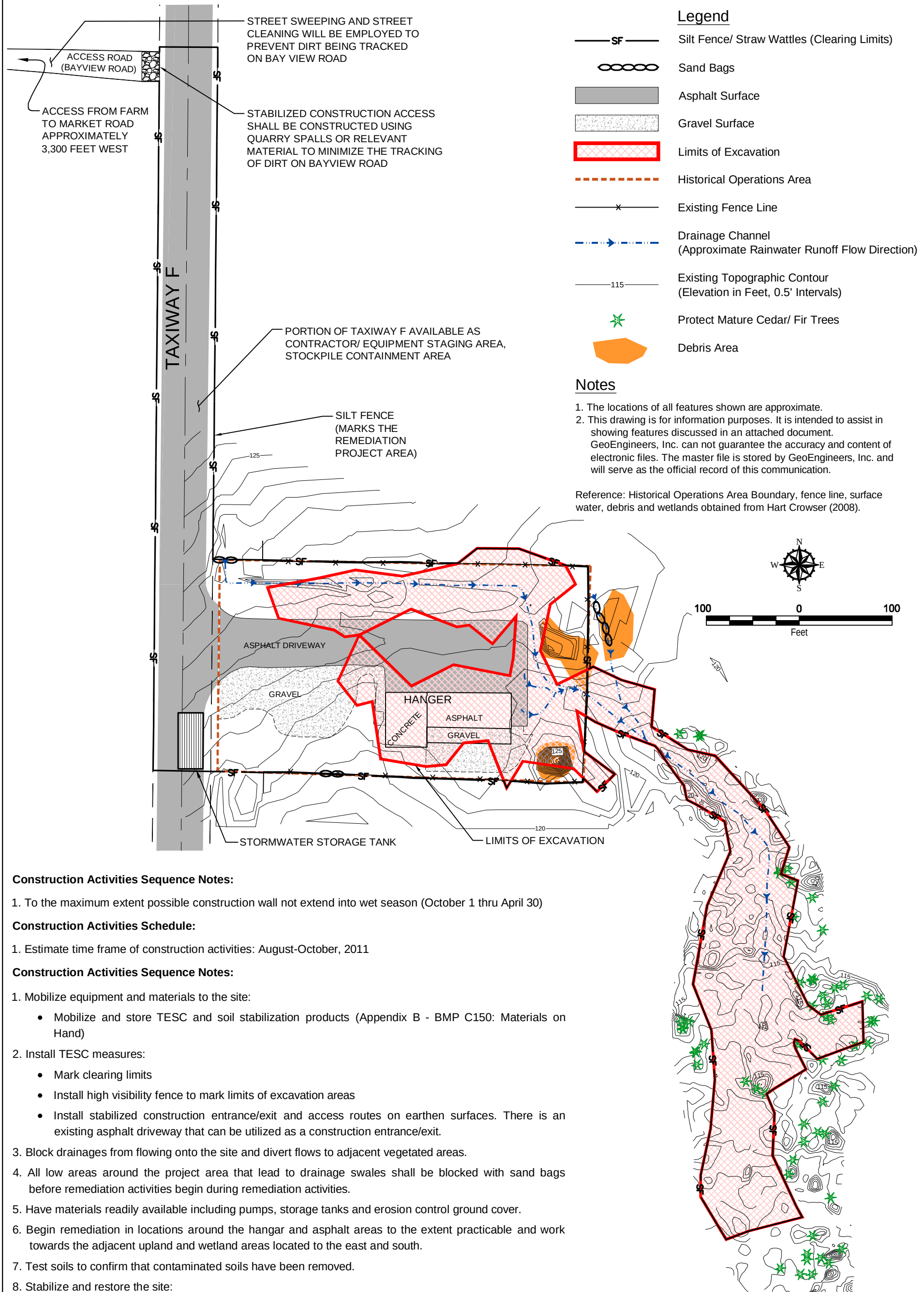


Existing Data Summary

- No Soil Cleanup Level Exceedance (GEI 2009-2010) - No Soil Cleanup Level Exceedance (Historical) - Soil Cleanup Level Exceedance (GEI 2009-2010) - Soil Cleanup Level Exceedance (Historical)	- Groundwater Cleanup Level Exceedance in Shallow Groundwater (2009 - 2010 Data) - No Groundwater Cleanup Level Exceedance in Shallow Groundwater (2009 - 2010 Data) - Limits of Excavation	- Historical Operations Area - Fence Line - Debris Area - Approximate Rainwater Runoff Flow Direction	- Approximate Limits of Wetland Areas (Based on Hart Crowder 2007 Survey) - Mature Cedar/Fir Tree - Topographic Contour (elevation in feet)



Overview Site Plan	
Taxiway F Site Burlington, Washington	
GEOENGINEERS	Figure A-1

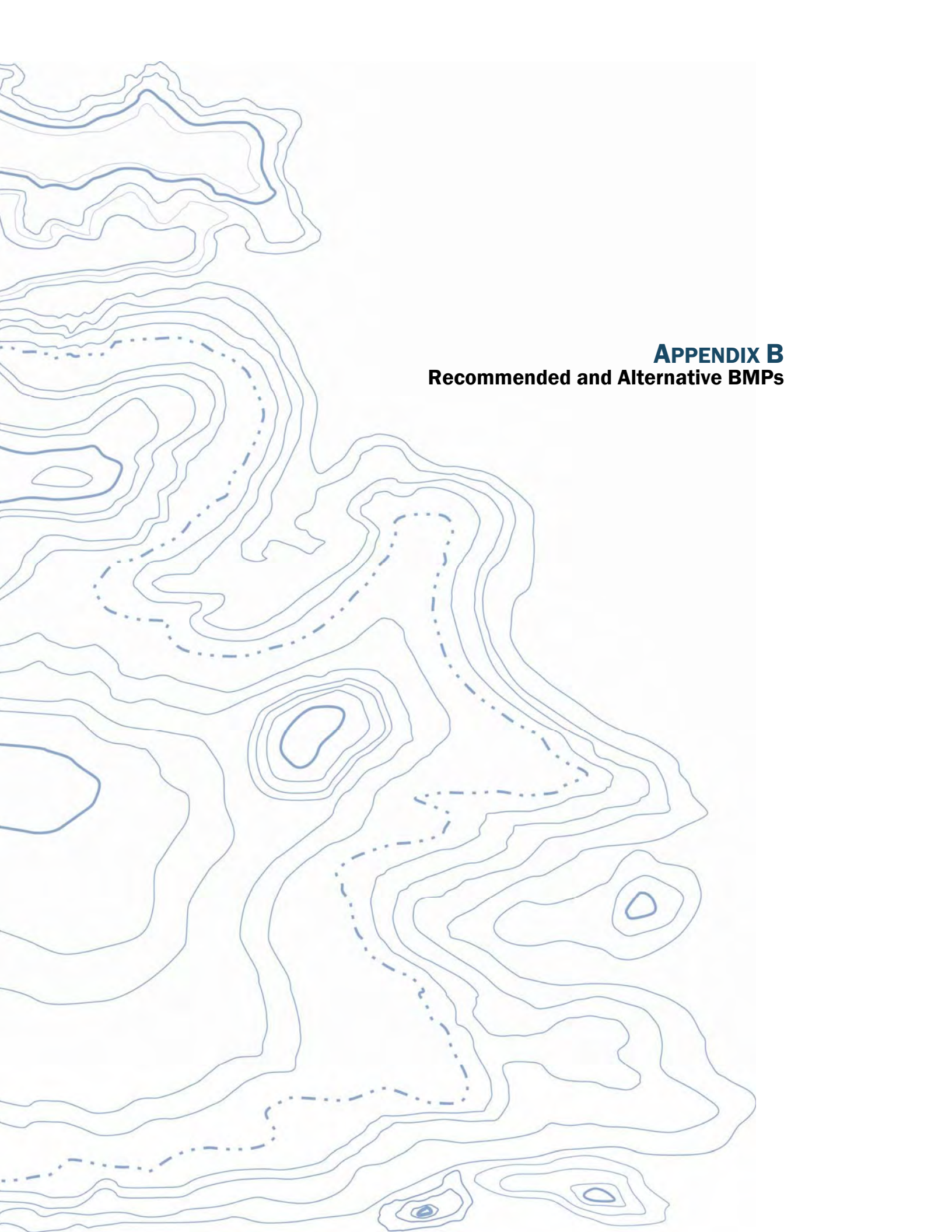


Temporary Erosion and Sediment Control (TESC) Plan

Taxiway F Site
Burlington, Washington

GEOENGINEERS

Figure A-2

A topographic map background with blue contour lines of varying thicknesses. A dashed blue line winds through the map, likely representing a proposed path or boundary. The map is oriented with North at the top.

APPENDIX B

Recommended and Alternative BMPs

Recommended BMPs

BMP C101: Preserving Natural Vegetation

Purpose The purpose of preserving natural vegetation is to reduce erosion wherever practicable. Limiting site disturbance is the single most effective method for reducing erosion. For example, conifers can hold up to about 50 percent of all rain that falls during a storm. Up to 20-30 percent of this rain may never reach the ground but is taken up by the tree or evaporates. Another benefit is that the rain held in the tree can be released slowly to the ground after the storm.

Conditions of Use

- Natural vegetation should be preserved on steep slopes, near perennial and intermittent watercourses or swales, and on building sites in wooded areas.
- As required by local governments.

**Design and
Installation
Specifications**

Natural vegetation can be preserved in natural clumps or as individual trees, shrubs and vines.

The preservation of individual plants is more difficult because heavy equipment is generally used to remove unwanted vegetation. The points to remember when attempting to save individual plants are:

- Is the plant worth saving? Consider the location, species, size, age, vigor, and the work involved. Local governments may also have ordinances to save natural vegetation and trees.
- Fence or clearly mark areas around trees that are to be saved. It is preferable to keep ground disturbance away from the trees at least as far out as the dripline.

Plants need protection from three kinds of injuries:

- *Construction Equipment* - This injury can be above or below the ground level. Damage results from scarring, cutting of roots, and compaction of the soil. Placing a fenced buffer zone around plants to be saved prior to construction can prevent construction equipment injuries.
- *Grade Changes* - Changing the natural ground level will alter grades, which affects the plant's ability to obtain the necessary air, water, and minerals. Minor fills usually do not cause problems although sensitivity between species does vary and should be checked. Trees can tolerate fill of 6 inches or less. For shrubs and other plants, the fill should be less.

When there are major changes in grade, it may become necessary to supply air to the roots of plants. This can be done by placing a layer of gravel and a tile system over the roots before the fill is made. A tile

system protects a tree from a raised grade. The tile system should be laid out on the original grade leading from a dry well around the tree trunk. The system should then be covered with small stones to allow air to circulate over the root area.

Lowering the natural ground level can seriously damage trees and shrubs. The highest percentage of the plant roots are in the upper 12 inches of the soil and cuts of only 2-3 inches can cause serious injury. To protect the roots it may be necessary to terrace the immediate area around the plants to be saved. If roots are exposed, construction of retaining walls may be needed to keep the soil in place. Plants can also be preserved by leaving them on an undisturbed, gently sloping mound. To increase the chances for survival, it is best to limit grade changes and other soil disturbances to areas outside the dripline of the plant.

- *Excavations* - Protect trees and other plants when excavating for drainfields, power, water, and sewer lines. Where possible, the trenches should be routed around trees and large shrubs. When this is not possible, it is best to tunnel under them. This can be done with hand tools or with power augers. If it is not possible to route the trench around plants to be saved, then the following should be observed:

Cut as few roots as possible. When you have to cut, cut clean. Paint cut root ends with a wood dressing like asphalt base paint.

Backfill the trench as soon as possible.

Tunnel beneath root systems as close to the center of the main trunk to preserve most of the important feeder roots.

Some problems that can be encountered with a few specific trees are:

- Maple, Dogwood, Red alder, Western hemlock, Western red cedar, and Douglas fir do not readily adjust to changes in environment and special care should be taken to protect these trees.
- The windthrow hazard of Pacific silver fir and madronna is high, while that of Western hemlock is moderate. The danger of windthrow increases where dense stands have been thinned. Other species (unless they are on shallow, wet soils less than 20 inches deep) have a low windthrow hazard.
- Cottonwoods, maples, and willows have water-seeking roots. These can cause trouble in sewer lines and infiltration fields. On the other hand, they thrive in high moisture conditions that other trees would not.
- Thinning operations in pure or mixed stands of Grand fir, Pacific silver fir, Noble fir, Sitka spruce, Western red cedar, Western hemlock,

Pacific dogwood, and Red alder can cause serious disease problems. Disease can become established through damaged limbs, trunks, roots, and freshly cut stumps. Diseased and weakened trees are also susceptible to insect attack.

***Maintenance
Standards***

- Inspect flagged and/or fenced areas regularly to make sure flagging or fencing has not been removed or damaged. If the flagging or fencing has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.
- If tree roots have been exposed or injured, “prune” cleanly with an appropriate pruning saw or loppers directly above the damaged roots and recover with native soils. Treatment of sap flowing trees (fir, hemlock, pine, soft maples) is not advised as sap forms a natural healing barrier.

BMP C102: Buffer Zones

<i>Purpose</i>	An undisturbed area or strip of natural vegetation or an established suitable planting that will provide a living filter to reduce soil erosion and runoff velocities.
<i>Conditions of Use</i>	Natural buffer zones are used along streams, wetlands and other bodies of water that need protection from erosion and sedimentation. Vegetative buffer zones can be used to protect natural swales and can be incorporated into the natural landscaping of an area. Critical-areas buffer zones should not be used as sediment treatment areas. These areas shall remain completely undisturbed. The local permitting authority may expand the buffer widths temporarily to allow the use of the expanded area for removal of sediment.
<i>Design and Installation Specifications</i>	• Preserving natural vegetation or plantings in clumps, blocks, or strips is generally the easiest and most successful method. • Leave all unstable steep slopes in natural vegetation. • Mark clearing limits and keep all equipment and construction debris out of the natural areas. Steel construction fencing is the most effective method in protecting sensitive areas and buffers. Alternatively, wire-backed silt fence on steel posts is marginally effective. Flagging alone is typically not effective. • Keep all excavations outside the dripline of trees and shrubs. • Do not push debris or extra soil into the buffer zone area because it will cause damage from burying and smothering. • Vegetative buffer zones for streams, lakes or other waterways shall be established by the local permitting authority or other state or federal permits or approvals.
<i>Maintenance Standards</i>	• Inspect the area frequently to make sure flagging remains in place and the area remains undisturbed.

BMP C103: High Visibility Plastic or Metal Fence

<i>Purpose</i>	Fencing is intended to: (1) restrict clearing to approved limits; (2) prevent disturbance of sensitive areas, their buffers, and other areas required to be left undisturbed; (3) limit construction traffic to designated construction entrances or roads; and, (4) protect areas where marking with survey tape may not provide adequate protection.
<i>Conditions of Use</i>	To establish clearing limits, plastic or metal fence may be used: • At the boundary of sensitive areas, their buffers, and other areas required to be left uncleared. • As necessary to control vehicle access to and on the site.
<i>Design and Installation Specifications</i>	• High visibility plastic fence shall be composed of a high-density polyethylene material and shall be at least four feet in height. Posts for the fencing shall be steel or wood and placed every 6 feet on center (maximum) or as needed to ensure rigidity. The fencing shall be fastened to the post every six inches with a polyethylene tie. On long continuous lengths of fencing, a tension wire or rope shall be used as a top stringer to prevent sagging between posts. The fence color shall be high visibility orange. The fence tensile strength shall be 360 lbs./ft. using the ASTM D4595 testing method. • Metal fences shall be designed and installed according to the manufacturer's specifications. • Metal fences shall be at least 3 feet high and must be highly visible. • Fences shall not be wired or stapled to trees.
<i>Maintenance Standards</i>	• If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.

BMP C105: Stabilized Construction Entrance

Purpose

Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by vehicles or equipment by constructing a stabilized pad of quarry spalls at entrances to construction sites.

Conditions of Use

Construction entrances shall be stabilized wherever traffic will be leaving a construction site and traveling on paved roads or other paved areas within 1,000 feet of the site.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow for additional stabilized entrances not shown in the initial Construction SWPPP. It is difficult to determine exactly where access to these projects will take place; additional materials will enable the contractor to install them where needed.

Design and Installation Specifications

- See Figure 4.2 for details. Note: the 100' minimum length of the entrance shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').
- A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the following standards:

Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will be paved; this can be used as a stabilized entrance. Also consider the installation of excess concrete as a stabilized entrance. During large concrete pours, excess concrete is often available for this purpose.
- Hog fuel (wood-based mulch) may be substituted for or combined with quarry spalls in areas that will not be used for permanent roads. Hog fuel is generally less effective at stabilizing construction entrances and should be used only at sites where the amount of traffic is very limited. Hog fuel is not recommended for entrance stabilization in urban areas. The effectiveness of hog fuel is highly variable and it generally requires more maintenance than quarry spalls. The inspector may at any time require the use of quarry spalls if the hog fuel is not preventing sediment from being tracked onto pavement or if the hog fuel is being carried onto pavement. Hog fuel is prohibited in permanent roadbeds because organics in the subgrade soils cause degradation of the subgrade support over time.
- Fencing (see BMPs C103 and C104) shall be installed as necessary to restrict traffic to the construction entrance.

Maintenance Standards

- Whenever possible, the entrance shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.
- Quarry spalls (or hog fuel) shall be added if the pad is no longer in accordance with the specifications.
- If the entrance is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see BMPs C103 and C104) shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

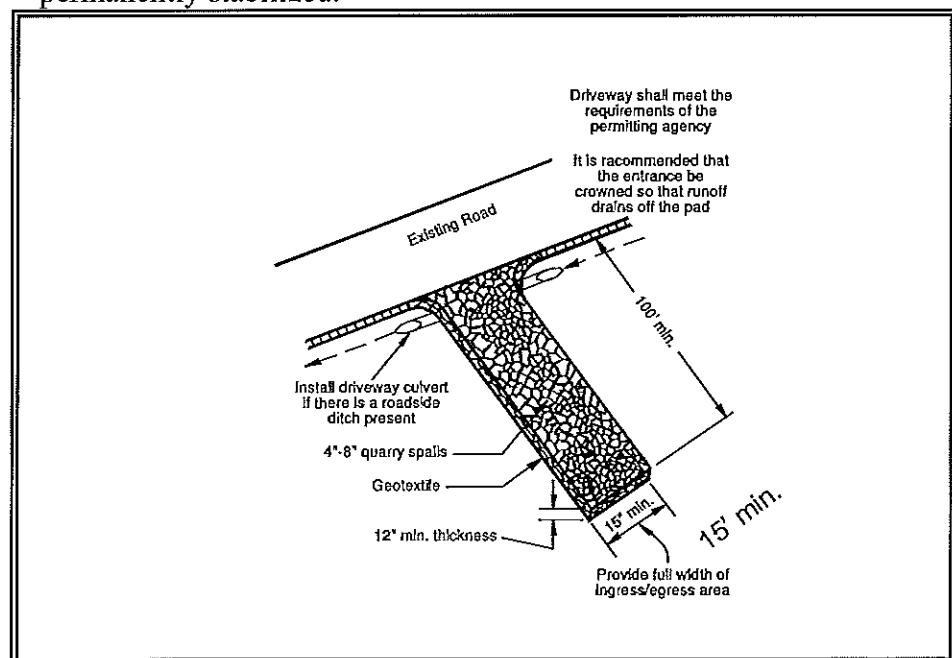


Figure 4.2 – Stabilized Construction Entrance

BMP C107: Construction Road/Parking Area Stabilization

<i>Purpose</i>	Stabilizing subdivision roads, parking areas, and other onsite vehicle transportation routes immediately after grading reduces erosion caused by construction traffic or runoff.
<i>Conditions of Use</i>	• Roads or parking areas shall be stabilized wherever they are constructed, whether permanent or temporary, for use by construction traffic. • Fencing (see BMPs C103 and C104) shall be installed, if necessary, to limit the access of vehicles to only those roads and parking areas that are stabilized.
<i>Design and Installation Specifications</i>	• On areas that will receive asphalt as part of the project, install the first lift as soon as possible. • A 6-inch depth of 2- to 4-inch crushed rock, gravel base, or crushed surfacing base course shall be applied immediately after grading or utility installation. A 4-inch course of asphalt treated base (ATB) may also be used, or the road/parking area may be paved. It may also be possible to use cement or calcium chloride for soil stabilization. If cement or cement kiln dust is used for roadbase stabilization, pH monitoring and BMPs are necessary to evaluate and minimize the effects on stormwater. If the area will not be used for permanent roads, parking areas, or structures, a 6-inch depth of hog fuel may also be used, but this is likely to require more maintenance. Whenever possible, construction roads and parking areas shall be placed on a firm, compacted subgrade. • Temporary road gradients shall not exceed 15 percent. Roadways shall be carefully graded to drain. Drainage ditches shall be provided on each side of the roadway in the case of a crowned section, or on one side in the case of a super-elevated section. Drainage ditches shall be directed to a sediment control BMP. • Rather than relying on ditches, it may also be possible to grade the road so that runoff sheet-flows into a heavily vegetated area with a well-developed topsoil. Landscaped areas are not adequate. If this area has at least 50 feet of vegetation, then it is generally preferable to use the vegetation to treat runoff, rather than a sediment pond or trap. The 50 feet shall not include wetlands. If runoff is allowed to sheetflow through adjacent vegetated areas, it is vital to design the roadways and parking areas so that no concentrated runoff is created. • Storm drain inlets shall be protected to prevent sediment-laden water entering the storm drain system (see BMP C220).
<i>Maintenance Standards</i>	• Inspect stabilized areas regularly, especially after large storm events. • Crushed rock, gravel base, hog fuel, etc. shall be added as required to maintain a stable driving surface and to stabilize any areas that have eroded. • Following construction, these areas shall be restored to pre-construction condition or better to prevent future erosion.

BMP C120: Temporary and Permanent Seeding

Purpose

Seeding is intended to reduce erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Conditions of Use

- Seeding may be used throughout the project on disturbed areas that have reached final grade or that will remain unworked for more than 30 days.
- Channels that will be vegetated should be installed before major earthwork and hydroseeded with a Bonded Fiber Matrix. The vegetation should be well established (i.e., 75 percent cover) before water is allowed to flow in the ditch. With channels that will have high flows, erosion control blankets should be installed over the hydroseed. If vegetation cannot be established from seed before water is allowed in the ditch, sod should be installed in the bottom of the ditch over hydromulch and blankets.
- Retention/detention ponds should be seeded as required.
- Mulch is required at all times because it protects seeds from heat, moisture loss, and transport due to runoff.
- All disturbed areas shall be reviewed in late August to early September and all seeding should be completed by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.
- At final site stabilization, all disturbed areas not otherwise vegetated or stabilized shall be seeded and mulched. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions or geotextiles) which will prevent erosion.

Design and Installation Specifications

- Seeding should be done during those seasons most conducive to growth and will vary with the climate conditions of the region. Local experience should be used to determine the appropriate seeding periods.
- The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1. Seeding that occurs between July 1 and August 30 will require irrigation until 75 percent grass cover is established. Seeding that occurs between October 1 and March 30 will require a mulch or plastic cover until 75 percent grass cover is established.
- To prevent seed from being washed away, confirm that all required surface water control measures have been installed.

- The seedbed should be firm and rough. All soil should be roughened no matter what the slope. If compaction is required for engineering purposes, slopes must be track walked before seeding. Backblading or smoothing of slopes greater than 4:1 is not allowed if they are to be seeded.
- New and more effective restoration-based landscape practices rely on deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical the subgrade should be initially ripped to improve long-term permeability, infiltration, and water inflow qualities. At a minimum, permanent areas shall use soil amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches the rototilling process should be done in multiple lifts, or the prepared soil system shall be prepared properly and then placed to achieve the specified depth.
- Organic matter is the most appropriate form of “fertilizer” because it provides nutrients (including nitrogen, phosphorus, and potassium) in the least water-soluble form. A natural system typically releases 2-10 percent of its nutrients annually. Chemical fertilizers have since been formulated to simulate what organic matter does naturally.
- In general, 10-4-6 N-P-K (nitrogen-phosphorus-potassium) fertilizer can be used at a rate of 90 pounds per acre. Slow-release fertilizers should always be used because they are more efficient and have fewer environmental impacts. It is recommended that areas being seeded for final landscaping conduct soil tests to determine the exact type and quantity of fertilizer needed. This will prevent the over-application of fertilizer. Fertilizer should not be added to the hydromulch machine and agitated more than 20 minutes before it is to be used. If agitated too much, the slow-release coating is destroyed.
- There are numerous products available on the market that take the place of chemical fertilizers. These include several with seaweed extracts that are beneficial to soil microbes and organisms. If 100 percent cottonseed meal is used as the mulch in hydroseed, chemical fertilizer may not be necessary. Cottonseed meal is a good source of long-term, slow-release, available nitrogen.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 percent tackifier. Mulch may be made up of 100 percent: cottonseed meal; fibers made of wood, recycled cellulose, hemp, and kenaf; compost; or blends of these. Tackifier shall be plant-based, such as guar or alpha plantago, or chemical-based such as polyacrylamide or polymers. Any mulch or tackifier product used shall be installed per manufacturer’s instructions. Generally, mulches come in 40-50 pound bags. Seed and fertilizer are added at time of application.

- Mulch is always required for seeding. Mulch can be applied on top of the seed or simultaneously by hydroseeding.
- On steep slopes, Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products should be used. BFM/MBFM products are applied at a minimum rate of 3,000 pounds per acre of mulch with approximately 10 percent tackifier. Application is made so that a minimum of 95 percent soil coverage is achieved. Numerous products are available commercially and should be installed per manufacturer's instructions. Most products require 24-36 hours to cure before a rainfall and cannot be installed on wet or saturated soils. Generally, these products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.

BFBMs and MBFBMs have some advantages over blankets:

- No surface preparation required;
- Can be installed via helicopter in remote areas;
- On slopes steeper than 2.5:1, blanket installers may need to be roped and harnessed for safety;
- They are at least \$1,000 per acre cheaper installed.

In most cases, the shear strength of blankets is not a factor when used on slopes, only when used in channels. BFBMs and MBFBMs are good alternatives to blankets in most situations where vegetation establishment is the goal.

- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. One way to overcome this is to increase seed quantities by up to 50 percent.
- Vegetation establishment can also be enhanced by dividing the hydromulch operation into two phases:
 1. Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift;
 2. Phase 2- Install the rest of the mulch and tackifier over the first lift.

An alternative is to install the mulch, seed, fertilizer, and tackifier in one lift. Then, spread or blow straw over the top of the hydromulch at a rate of about 800-1000 pounds per acre. Hold straw in place with a standard tackifier. Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:

1. Irrigation
2. Reapplication of mulch
3. Repair of failed slope surfaces

This technique works with standard hydromulch (1,500 pounds per acre minimum) and BFM/MBFMs (3,000 pounds per acre minimum).

- Areas to be permanently landscaped shall provide a healthy topsoil that reduces the need for fertilizers, improves overall topsoil quality, provides for better vegetal health and vitality, improves hydrologic characteristics, and reduces the need for irrigation. This can be accomplished in a number of ways:

Recent research has shown that the best method to improve till soils is to amend these soils with compost. The optimum mixture is approximately two parts soil to one part compost. This equates to 4 inches of compost mixed to a depth of 12 inches in till soils. Increasing the concentration of compost beyond this level can have negative effects on vegetal health, while decreasing the concentrations can reduce the benefits of amended soils. Please note: The compost should meet specifications for Grade A quality compost in Ecology Publication 94-038.

Other soils, such as gravel or cobble outwash soils, may require different approaches. Organics and fines easily migrate through the loose structure of these soils. Therefore, the importation of at least 6 inches of quality topsoil, underlain by some type of filter fabric to prevent the migration of fines, may be more appropriate for these soils.

Areas that already have good topsoil, such as undisturbed areas, do not require soil amendments.

- Areas that will be seeded only and not landscaped may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Native topsoil should be re-installed on the disturbed soil surface before application.
- Seed that is installed as a temporary measure may be installed by hand if it will be covered by straw, mulch, or topsoil. Seed that is installed as a permanent measure may be installed by hand on small areas (usually less than 1 acre) that will be covered with mulch, topsoil, or erosion blankets. The seed mixes listed below include recommended mixes for both temporary and permanent seeding. These mixes, with the exception of the wetland mix, shall be applied at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slow-release fertilizers are used. Local suppliers or the local conservation district should be consulted for their recommendations because the appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used.

Table 4.1 represents the standard mix for those areas where just a temporary vegetative cover is required.

Table 4.1 Temporary Erosion Control Seed Mix			
	% Weight	% Purity	% Germination
Chewings or annual blue grass <i>Festuca rubra</i> var. <i>commutata</i> or <i>Poa annua</i>	40	98	90
Perennial rye - <i>Lolium perenne</i>	50	98	90
Redtop or colonial bentgrass <i>Agrostis alba</i> or <i>Agrostis tenuis</i>	5	92	85
White dutch clover <i>Trifolium repens</i>	5	98	90

Table 4.2 provides just one recommended possibility for landscaping seed.

Table 4.2 Landscaping Seed Mix			
	% Weight	% Purity	% Germination
Perennial rye blend <i>Lolium perenne</i>	70	98	90
Chewings and red fescue blend <i>Festuca rubra</i> var. <i>commutata</i> or <i>Festuca rubra</i>	30	98	90

This turf seed mix in Table 4.3 is for dry situations where there is no need for much water. The advantage is that this mix requires very little maintenance.

Table 4.3 Low-Growing Turf Seed Mix			
	% Weight	% Purity	% Germination
Dwarf tall fescue (several varieties) <i>Festuca arundinacea</i> var.	45	98	90
Dwarf perennial rye (Barclay) <i>Lolium perenne</i> var. <i>barclay</i>	30	98	90
Red fescue <i>Festuca rubra</i>	20	98	90
Colonial bentgrass <i>Agrostis tenuis</i>	5	98	90

Table 4.4 presents a mix recommended for bioswales and other intermittently wet areas.

Table 4.4 Bioswale Seed Mix*			
	% Weight	% Purity	% Germination
Tall or meadow fescue <i>Festuca arundinacea</i> or <i>Festuca elatior</i>	75-80	98	90
Seaside/Creeping bentgrass <i>Agrostis palustris</i>	10-15	92	85
Redtop bentgrass <i>Agrostis alba</i> or <i>Agrostis gigantea</i>	5-10	90	80

* Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix

The seed mix shown in Table 4.5 is a recommended low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands. Other mixes may be appropriate, depending on the soil type and hydrology of the area. Recent research suggests that bentgrass (*agrostis* sp.) should be emphasized in wet-area seed mixes. Apply this mixture at a rate of 60 pounds per acre.

Table 4.5 Wet Area Seed Mix*			
	% Weight	% Purity	% Germination
Tall or meadow fescue <i>Festuca arundinacea</i> or <i>Festuca elatior</i>	60-70	98	90
Seaside/Creeping bentgrass <i>Agrostis palustris</i>	10-15	98	85
Meadow foxtail <i>Alepocurus pratensis</i>	10-15	90	80
Alsike clover <i>Trifolium hybridum</i>	1-6	98	90
Redtop bentgrass <i>Agrostis alba</i>	1-6	92	85

* Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix

The meadow seed mix in Table 4.6 is recommended for areas that will be maintained infrequently or not at all and where colonization by native plants is desirable. Likely applications include rural road and utility right-of-way. Seeding should take place in September or very early October in order to obtain adequate establishment prior to the winter months. The appropriateness of clover in the mix may need to be considered, as this can be a fairly invasive species. If the soil is amended, the addition of clover may not be necessary.

Table 4.6 Meadow Seed Mix			
	% Weight	% Purity	% Germination
Redtop or Oregon bentgrass <i>Agrostis alba</i> or <i>Agrostis oregonensis</i>	20	92	85
Red fescue <i>Festuca rubra</i>	70	98	90
White dutch clover <i>Trifolium repens</i>	10	98	90

Maintenance Standards

- Any seeded areas that fail to establish at least 80 percent cover (100 percent cover for areas that receive sheet or concentrated flows) shall be reseeded. If reseeding is ineffective, an alternate method, such as sodding, mulching, or nets/blankets, shall be used. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the local authority when sensitive areas would otherwise be protected.

- After adequate cover is achieved, any areas that experience erosion shall be reseeded and protected by mulch. If the erosion problem is drainage related, the problem shall be fixed and the eroded area reseeded and protected by mulch.
- Seeded areas shall be supplied with adequate moisture, but not watered to the extent that it causes runoff.

BMP C121: Mulching

Purpose

The purpose of mulching soils is to provide immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. There is an enormous variety of mulches that can be used. Only the most common types are discussed in this section.

Conditions of Use

As a temporary cover measure, mulch should be used:

- On disturbed areas that require cover measures for less than 30 days.
- As a cover for seed during the wet season and during the hot summer months.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief.
- Mulch may be applied at any time of the year and must be refreshed periodically.

Design and Installation Specifications

For mulch materials, application rates, and specifications, see Table 4.7. Note: Thicknesses may be increased for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.

Mulch used within the ordinary high-water mark of surface waters should be selected to minimize potential flotation of organic matter. Composted organic materials have higher specific gravities (densities) than straw, wood, or chipped material.

Maintenance Standards

- The thickness of the cover must be maintained.
- Any areas that experience erosion shall be remulched and/or protected with a net or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area remulched.

**Table 4.7
Mulch Standards and Guidelines**

Mulch Material	Quality Standards	Application Rates	Remarks
Straw	Air-dried; free from undesirable seed and coarse material.	2"-3" thick; 5 bales per 1000 sf or 2-3 tons per acre	Cost-effective protection when applied with adequate thickness. Hand-application generally requires greater thickness than blown straw. The thickness of straw may be reduced by half when used in conjunction with seeding. In windy areas straw must be held in place by crimping, using a tackifier, or covering with netting. Blown straw always has to be held in place with a tackifier as even light winds will blow it away. Straw, however, has several deficiencies that should be considered when selecting mulch materials. It often introduces and/or encourages the propagation of weed species and it has no significant long-term benefits. Straw should be used only if mulches with long-term benefits are unavailable locally. It should also not be used within the ordinary high-water elevation of surface waters (due to flotation).
Hydromulch	No growth inhibiting factors.	Approx. 25-30 lbs per 1000 sf or 1500 - 2000 lbs per acre	Shall be applied with hydromulcher. Shall not be used without seed and tackifier unless the application rate is at least doubled. Fibers longer than about ¾-1 inch clog hydromulch equipment. Fibers should be kept to less than ¾ inch.
Composted Mulch and Compost	No visible water or dust during handling. Must be purchased from supplier with Solid Waste Handling Permit (unless exempt).	2" thick min.; approx. 100 tons per acre (approx. 800 lbs per yard)	More effective control can be obtained by increasing thickness to 3". Excellent mulch for protecting final grades until landscaping because it can be directly seeded or tilled into soil as an amendment. Composted mulch has a coarser size gradation than compost. It is more stable and practical to use in wet areas and during rainy weather conditions.
Chipped Site Vegetation	Average size shall be several inches. Gradations from fines to 6 inches in length for texture, variation, and interlocking properties.	2" minimum thickness	This is a cost-effective way to dispose of debris from clearing and grubbing, and it eliminates the problems associated with burning. Generally, it should not be used on slopes above approx. 10% because of its tendency to be transported by runoff. It is not recommended within 200 feet of surface waters. If seeding is expected shortly after mulch, the decomposition of the chipped vegetation may tie up nutrients important to grass establishment.
Wood-based Mulch	No visible water or dust during handling. Must be purchased from a supplier with a Solid Waste Handling Permit or one exempt from solid waste regulations.	2" thick; approx. 100 tons per acre (approx. 800 lbs. per cubic yard)	This material is often called "hog or hogged fuel." It is usable as a material for Stabilized Construction Entrances (BMP C105) and as a mulch. The use of mulch ultimately improves the organic matter in the soil. Special caution is advised regarding the source and composition of wood-based mulches. Its preparation typically does not provide any weed seed control, so evidence of residual vegetation in its composition or known inclusion of weed plants or seeds should be monitored and prevented (or minimized).

Maintenance Standards

- Catch basin filters should be inspected frequently, especially after storm events. If the insert becomes clogged, it should be cleaned or replaced.
- For systems using stone filters: If the stone filter becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.

BMP C122: Nets and Blankets

Purpose

Erosion control nets and blankets are intended to prevent erosion and hold seed and mulch in place on steep slopes and in channels so that vegetation can become well established. In addition, some nets and blankets can be used to permanently reinforce turf to protect drainage ways during high flows. Nets (commonly called matting) are strands of material woven into an open, but high-tensile strength net (for example, coconut fiber matting). Blankets are strands of material that are not tightly woven, but instead form a layer of interlocking fibers, typically held together by a biodegradable or photodegradable netting (for example, excelsior or straw blankets). They generally have lower tensile strength than nets, but cover the ground more completely. Coir (coconut fiber) fabric comes as both nets and blankets.

Conditions of Use

Erosion control nets and blankets should be used:

- To aid permanent vegetated stabilization of slopes 2H:1V or greater and with more than 10 feet of vertical relief.
- For drainage ditches and swales (highly recommended). The application of appropriate netting or blanket to drainage ditches and swales can protect bare soil from channelized runoff while vegetation is established. Nets and blankets also can capture a great deal of sediment due to their open, porous structure. Synthetic nets and blankets can be used to permanently stabilize channels and may provide a cost-effective, environmentally preferable alternative to riprap. 100 percent synthetic blankets manufactured for use in ditches may be easily reused as temporary ditch liners.

Disadvantages of blankets include:

- Surface preparation required;
- On slopes steeper than 2.5:1, blanket installers may need to be roped and harnessed for safety;
- They cost at least \$4,000-6,000 per acre installed.

Advantages of blankets include:

- Can be installed without mobilizing special equipment;
- Can be installed by anyone with minimal training;
- Can be installed in stages or phases as the project progresses;
- Seed and fertilizer can be hand-placed by the installers as they progress down the slope;
- Can be installed in any weather;
- There are numerous types of blankets that can be designed with various parameters in mind. Those parameters include: fiber blend, mesh strength, longevity, biodegradability, cost, and availability.

***Design and
Installation
Specifications***

- See Figure 4.4 and Figure 4.5 for typical orientation and installation of blankets used in channels and as slope protection. Note: these are typical only; all blankets must be installed per manufacturer's installation instructions.
- Installation is critical to the effectiveness of these products. If good ground contact is not achieved, runoff can concentrate under the product, resulting in significant erosion.
- Installation of Blankets on Slopes:
 1. Complete final grade and track walk up and down the slope.
 2. Install hydromulch with seed and fertilizer.
 3. Dig a small trench, approximately 12 inches wide by 6 inches deep along the top of the slope.
 4. Install the leading edge of the blanket into the small trench and staple approximately every 18 inches. NOTE: Staples are metal, "U"-shaped, and a minimum of 6 inches long. Longer staples are used in sandy soils. Biodegradable stakes are also available.
 5. Roll the blanket slowly down the slope as installer walks backwards. NOTE: The blanket rests against the installer's legs. Staples are installed as the blanket is unrolled. It is critical that the proper staple pattern is used for the blanket being installed. The blanket is not to be allowed to roll down the slope on its own as this stretches the blanket making it impossible to maintain soil contact. In addition, no one is allowed to walk on the blanket after it is in place.
 6. If the blanket is not long enough to cover the entire slope length, the trailing edge of the upper blanket should overlap the leading edge of the lower blanket and be stapled. On steeper slopes, this overlap should be installed in a small trench, stapled, and covered with soil.
- With the variety of products available, it is impossible to cover all the details of appropriate use and installation. Therefore, it is critical that the design engineer consults the manufacturer's information and that a site visit takes place in order to insure that the product specified is appropriate. Information is also available at the following web sites:
 1. WSDOT: <http://www.wsdot.wa.gov/eesc/environmental/>
 2. Texas Transportation Institute:
<http://www.dot.state.tx.us/insdtdot/orgchart/cmd/erosion/contents.htm>

- Jute matting must be used in conjunction with mulch (BMP C121). Excelsior, woven straw blankets and coir (coconut fiber) blankets may be installed without mulch. There are many other types of erosion control nets and blankets on the market that may be appropriate in certain circumstances.
- In general, most nets (e.g., jute matting) require mulch in order to prevent erosion because they have a fairly open structure. Blankets typically do not require mulch because they usually provide complete protection of the surface.
- Extremely steep, unstable, wet, or rocky slopes are often appropriate candidates for use of synthetic blankets, as are riverbanks, beaches and other high-energy environments. If synthetic blankets are used, the soil should be hydromulched first.
- 100 percent biodegradable blankets are available for use in sensitive areas. These organic blankets are usually held together with a paper or fiber mesh and stitching which may last up to a year.
- Most netting used with blankets is photodegradable, meaning they break down under sunlight (not UV stabilized). However, this process can take months or years even under bright sun. Once vegetation is established, sunlight does not reach the mesh. It is not uncommon to find non-degraded netting still in place several years after installation. This can be a problem if maintenance requires the use of mowers or ditch cleaning equipment. In addition, birds and small animals can become trapped in the netting.
- Good contact with the ground must be maintained, and erosion must not occur beneath the net or blanket.
- Any areas of the net or blanket that are damaged or not in close contact with the ground shall be repaired and stapled.
- If erosion occurs due to poorly controlled drainage, the problem shall be fixed and the eroded area protected.

Maintenance Standards

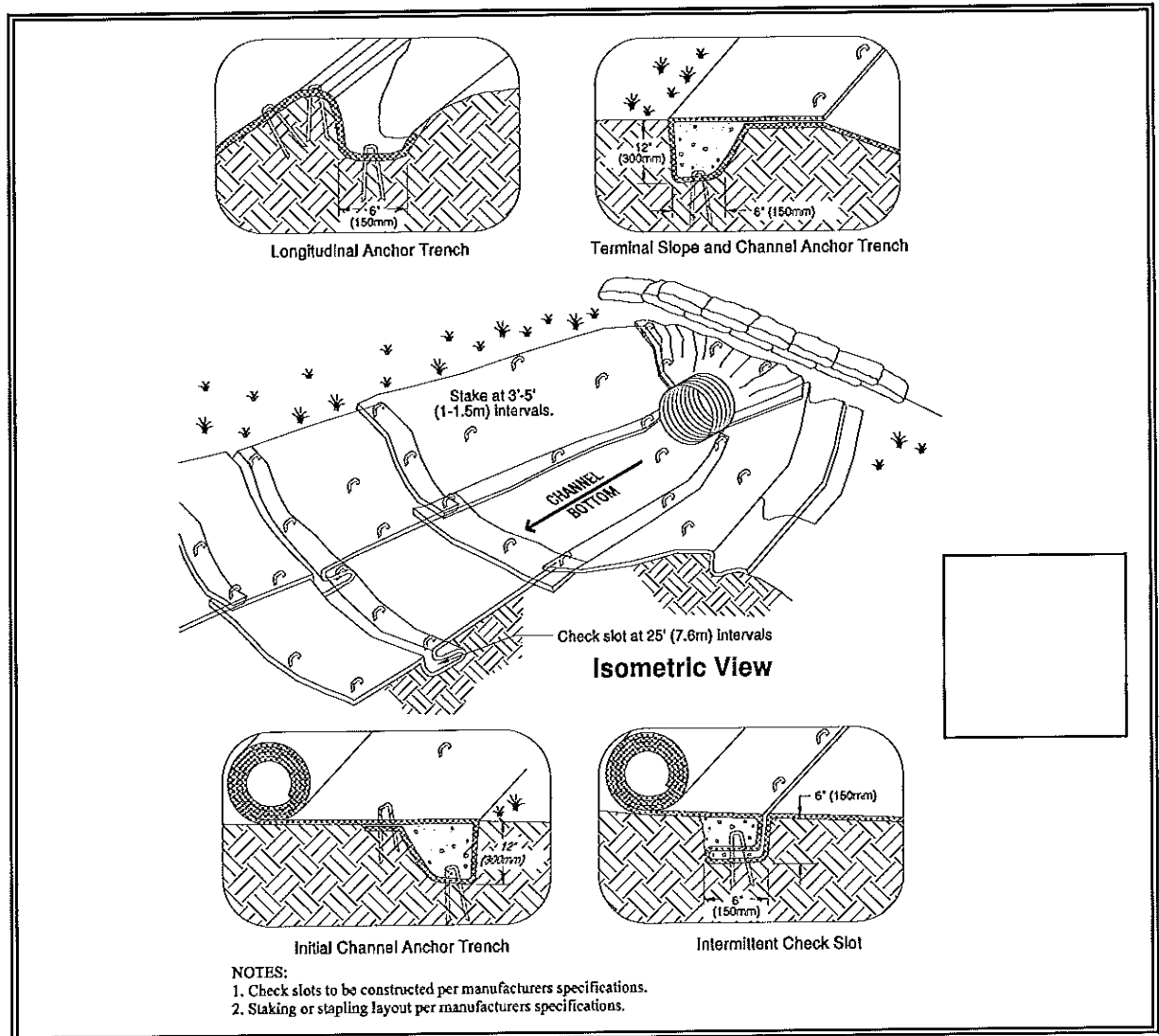


Figure 4.4 – Channel Installation

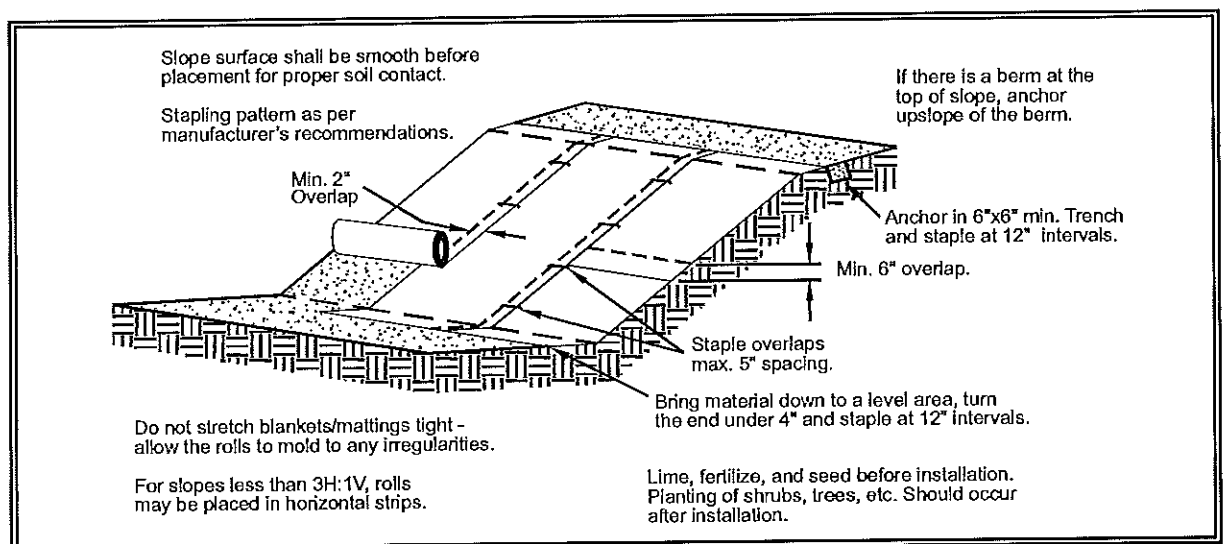


Figure 4.5 – Slope Installation

BMP C123: Plastic Covering

Purpose

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

Conditions of Use

- Plastic covering may be used on disturbed areas that require cover measures for less than 30 days, except as stated below.
- Plastic is particularly useful for protecting cut and fill slopes and stockpiles. Note: The relatively rapid breakdown of most polyethylene sheeting makes it unsuitable for long-term (greater than six months) applications.
- Clear plastic sheeting can be used over newly-seeded areas to create a greenhouse effect and encourage grass growth if the hydroseed was installed too late in the season to establish 75 percent grass cover, or if the wet season started earlier than normal. Clear plastic should not be used for this purpose during the summer months because the resulting high temperatures can kill the grass.
- Due to rapid runoff caused by plastic sheeting, this method shall not be used upslope of areas that might be adversely impacted by concentrated runoff. Such areas include steep and/or unstable slopes.
- While plastic is inexpensive to purchase, the added cost of installation, maintenance, removal, and disposal make this an expensive material, up to \$1.50-2.00 per square yard.
- Whenever plastic is used to protect slopes, water collection measures must be installed at the base of the slope. These measures include plastic-covered berms, channels, and pipes used to convey clean rainwater away from bare soil and disturbed areas. At no time is clean runoff from a plastic covered slope to be mixed with dirty runoff from a project.
- Other uses for plastic include:
 1. Temporary ditch liner;
 2. Pond liner in temporary sediment pond;
 3. Liner for bermed temporary fuel storage area if plastic is not reactive to the type of fuel being stored;
 4. Emergency slope protection during heavy rains; and,
 5. Temporary drainpipe ("elephant trunk") used to direct water.

Design and Installation Specifications

- Plastic slope cover must be installed as follows:
 1. Run plastic up and down slope, not across slope;
 2. Plastic may be installed perpendicular to a slope if the slope length is less than 10 feet;
 3. Minimum of 8-inch overlap at seams;
 4. On long or wide slopes, or slopes subject to wind, all seams should be taped;
 5. Place plastic into a small (12-inch wide by 6-inch deep) slot trench at the top of the slope and backfill with soil to keep water from flowing underneath;
 6. Place sand filled burlap or geotextile bags every 3 to 6 feet along seams and pound a wooden stake through each to hold them in place;
 7. Inspect plastic for rips, tears, and open seams regularly and repair immediately. This prevents high velocity runoff from contacting bare soil which causes extreme erosion;
 8. Sandbags may be lowered into place tied to ropes. However, all sandbags must be staked in place.
- Plastic sheeting shall have a minimum thickness of 0.06 millimeters.
- If erosion at the toe of a slope is likely, a gravel berm, riprap, or other suitable protection shall be installed at the toe of the slope in order to reduce the velocity of runoff.

Maintenance Standards

- Torn sheets must be replaced and open seams repaired.
- If the plastic begins to deteriorate due to ultraviolet radiation, it must be completely removed and replaced.
- When the plastic is no longer needed, it shall be completely removed.
- Dispose of old tires appropriately.

BMP C124: Sodding

<i>Purpose</i>	The purpose of sodding is to establish permanent turf for immediate erosion protection and to stabilize drainage ways where concentrated overland flow will occur.
<i>Conditions of Use</i>	Sodding may be used in the following areas: • Disturbed areas that require short-term or long-term cover. • Disturbed areas that require immediate vegetative cover. • All waterways that require vegetative lining. Waterways may also be seeded rather than sodded, and protected with a net or blanket.
<i>Design and Installation Specifications</i>	Sod shall be free of weeds, of uniform thickness (approximately 1-inch thick), and shall have a dense root mat for mechanical strength. The following steps are recommended for sod installation: • Shape and smooth the surface to final grade in accordance with the approved grading plan. The swale needs to be overexcavated 4 to 6 inches below design elevation to allow room for placing soil amendment and sod. • Amend 4 inches (minimum) of compost into the top 8 inches of the soil if the organic content of the soil is less than ten percent or the permeability is less than 0.6 inches per hour. Compost used should meet Ecology publication 94-038 specifications for Grade A quality compost. • Fertilize according to the supplier's recommendations. • Work lime and fertilizer 1 to 2 inches into the soil, and smooth the surface. • Lay strips of sod beginning at the lowest area to be sodded and perpendicular to the direction of water flow. Wedge strips securely into place. Square the ends of each strip to provide for a close, tight fit. Stagger joints at least 12 inches. Staple on slopes steeper than 3H:1V. Staple the upstream edge of each sod strip. • Roll the sodded area and irrigate. • When sodding is carried out in alternating strips or other patterns, seed the areas between the sod immediately after sodding.
<i>Maintenance Standards</i>	If the grass is unhealthy, the cause shall be determined and appropriate action taken to reestablish a healthy groundcover. If it is impossible to establish a healthy groundcover due to frequent saturation, instability, or some other cause, the sod shall be removed, the area seeded with an appropriate mix, and protected with a net or blanket.

BMP C140: Dust Control

<i>Purpose</i>	Dust control prevents wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters.
<i>Conditions of Use</i>	• In areas (including roadways) subject to surface and air movement of dust where on-site and off-site impacts to roadways, drainage ways, or surface waters are likely.
<i>Design and Installation Specifications</i>	• Vegetate or mulch areas that will not receive vehicle traffic. In areas where planting, mulching, or paving is impractical, apply gravel or landscaping rock. • Limit dust generation by clearing only those areas where immediate activity will take place, leaving the remaining area(s) in the original condition, if stable. Maintain the original ground cover as long as practical. • Construct natural or artificial windbreaks or windscreens. These may be designed as enclosures for small dust sources. • Sprinkle the site with water until surface is wet. Repeat as needed. To prevent carryout of mud onto street, refer to Stabilized Construction Entrance (BMP C105). • Irrigation water can be used for dust control. Irrigation systems should be installed as a first step on sites where dust control is a concern. • Spray exposed soil areas with a dust palliative, following the manufacturer's instructions and cautions regarding handling and application. Used oil is prohibited from use as a dust suppressant. Local governments may approve other dust palliatives such as calcium chloride or PAM. • PAM (BMP C126) added to water at a rate of 0.5 lbs. per 1,000 gallons of water per acre and applied from a water truck is more effective than water alone. This is due to the increased infiltration of water into the soil and reduced evaporation. In addition, small soil particles are bonded together and are not as easily transported by wind. Adding PAM may actually reduce the quantity of water needed for dust control, especially in eastern Washington. Since the wholesale cost of PAM is about \$ 4.00 per pound, this is an extremely cost-effective dust control method. Techniques that can be used for unpaved roads and lots include: • Lower speed limits. High vehicle speed increases the amount of dust stirred up from unpaved roads and lots. • Upgrade the road surface strength by improving particle size, shape, and mineral types that make up the surface and base materials.

- Add surface gravel to reduce the source of dust emission. Limit the amount of fine particles (those smaller than .075 mm) to 10 to 20 percent.
- Use geotextile fabrics to increase the strength of new roads or roads undergoing reconstruction.
- Encourage the use of alternate, paved routes, if available.
- Restrict use by tracked vehicles and heavy trucks to prevent damage to road surface and base.
- Apply chemical dust suppressants using the admix method, blending the product with the top few inches of surface material. Suppressants may also be applied as surface treatments.
- Pave unpaved permanent roads and other trafficked areas.
- Use vacuum street sweepers.
- Remove mud and other dirt promptly so it does not dry and then turn into dust.
- Limit dust-causing work on windy days.
- Contact your local Air Pollution Control Authority for guidance and training on other dust control measures. Compliance with the local Air Pollution Control Authority constitutes compliance with this BMP.

***Maintenance
Standards***

Respray area as necessary to keep dust to a minimum.

BMP C150: Materials On Hand

Purpose

Quantities of erosion prevention and sediment control materials can be kept on the project site at all times to be used for emergency situations such as unexpected heavy summer rains. Having these materials on-site reduces the time needed to implement BMPs when inspections indicate that existing BMPs are not meeting the Construction SWPPP requirements. In addition, contractors can save money by buying some materials in bulk and storing them at their office or yard.

Conditions of Use

- Construction projects of any size or type can benefit from having materials on hand. A small commercial development project could have a roll of plastic and some gravel available for immediate protection of bare soil and temporary berm construction. A large earthwork project, such as highway construction, might have several tons of straw, several rolls of plastic, flexible pipe, sandbags, geotextile fabric and steel "T" posts.
- Materials are stockpiled and readily available before any site clearing, grubbing, or earthwork begins. A large contractor or developer could keep a stockpile of materials that are available to be used on several projects.
- If storage space at the project site is at a premium, the contractor could maintain the materials at their office or yard. The office or yard must be less than an hour from the project site.

Design and Installation Specifications

Depending on project type, size, complexity, and length, materials and quantities will vary. A good minimum that will cover numerous situations includes:

Material	Measure	Quantity
Clear Plastic, 6 mil	100 foot roll	1-2
Drainpipe, 6 or 8 inch diameter	25 foot section	4-6
Sandbags, filled	each	25-50
Straw Bales for mulching,	approx. 50# each	10-20
Quarry Spalls	ton	2-4
Washed Gravel	cubic yard	2-4
Geotextile Fabric	100 foot roll	1-2
Catch Basin Inserts	each	2-4
Steel "T" Posts	each	12-24

Maintenance Standards

- All materials with the exception of the quarry spalls, steel "T" posts, and gravel should be kept covered and out of both sun and rain.
- Re-stock materials used as needed.

BMP C153: Material Delivery, Storage and Containment

<i>Purpose</i>	Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in a designated area, and installing secondary containment.
<i>Conditions of Use</i>	These procedures are suitable for use at all construction sites with delivery and storage of the following materials: • Petroleum products such as fuel, oil and grease • Soil stabilizers and binders (e.g. Polyacrylamide) • Fertilizers, pesticides and herbicides • Detergents • Asphalt and concrete compounds • Hazardous chemicals such as acids, lime, adhesives, paints, solvents and curing compounds • Any other material that may be detrimental if released to the environment
<i>Design and Installation Specifications</i>	The following steps should be taken to minimize risk: • Temporary storage area should be located away from vehicular traffic, near the construction entrance(s), and away from waterways or storm drains. • Material Safety Data Sheets (MSDS) should be supplied for all materials stored. Chemicals should be kept in their original labeled containers. • Hazardous material storage on-site should be minimized. • Hazardous materials should be handled as infrequently as possible. • During the wet weather season (Oct 1 – April 30), consider storing materials in a covered area. • Materials should be stored in secondary containments, such as earthen dike, horse trough, or even a children's wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays. • Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, in secondary containment.

- If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids to reduce corrosion. Domed plastic covers are inexpensive and snap to the top of drums, preventing water from collecting.

Material Storage Areas and Secondary Containment Practices:

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 shall be stored in approved containers and drums and shall not be overfilled. Containers and drums shall be stored in temporary secondary containment facilities.
- Temporary secondary containment facilities shall provide for a spill containment volume able to contain precipitation from a 25 year, 24 hour storm event, plus 10% of the total enclosed container volume of all containers, or 110% of the capacity of the largest container within its boundary, whichever is greater.
- Secondary containment facilities shall be impervious to the materials stored therein for a minimum contact time of 72 hours.
- Secondary containment facilities shall be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills shall be collected and placed into drums. These liquids shall be handled as hazardous waste unless testing determines them to be non-hazardous.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- During the wet weather season (Oct 1 – April 30), each secondary containment facility shall be covered during non-working days, prior to and during rain events.
- Keep material storage areas clean, organized and equipped with an ample supply of appropriate spill clean-up material (spill kit).
- The spill kit should include, at a minimum:
 - 1-Water Resistant Nylon Bag
 - 3-Oil Absorbent Socks 3"x 4'
 - 2-Oil Absorbent Socks 3"x 10'
 - 12-Oil Absorbent Pads 17"x19"
 - 1-Pair Splash Resistant Goggles
 - 3-Pair Nitrile Gloves
 - 10-Disposable Bags with Ties
 - Instructions

BMP C160: Certified Erosion and Sediment Control Lead

Purpose The project proponent designates at least one person as the responsible representative in charge of erosion and sediment control (ESC), and water quality protection. The designated person shall be the Certified Erosion and Sediment Control Lead (CESCL) who is responsible for ensuring compliance with all local, state, and federal erosion and sediment control and water quality requirements.

Conditions of Use A CESCL shall be made available on projects one acre or larger that discharge stormwater to surface waters of the state

- The CESCL shall:
 - Have a current certificate proving attendance in an erosion and sediment control training course that meets the minimum ESC training and certification requirements established by Ecology (see details below).

Ecology will maintain a list of ESC training and certification providers at: www.ecy.wa.gov/programs/wq/stormwater.

OR

- Be a Certified Professional in Erosion and Sediment Control (CPESC); for additional information go to: www.cpesc.net

Specifications

- Certification shall remain valid for three years.
- The CESCL shall have authority to act on behalf of the contractor or developer and shall be available, on call, 24 hours per day throughout the period of construction.
- The Construction SWPPP shall include the name, telephone number, fax number, and address of the designated CESCL.
- A CESCL may provide inspection and compliance services for multiple construction projects in the same geographic region.

Duties and responsibilities of the CESCL shall include, but are not limited to the following:

- Maintaining permit file on site at all times which includes the SWPPP and any associated permits and plans.
- Directing BMP installation, inspection, maintenance, modification, and removal.
- Updating all project drawings and the Construction SWPPP with changes made.

- Keeping daily logs, and inspection reports. Inspection reports should include:
 - Inspection date/time.
 - Weather information; general conditions during inspection and approximate amount of precipitation since the last inspection.
 - A summary or list of all BMPs implemented, including observations of all erosion/sediment control structures or practices. The following shall be noted:
 - 1) Locations of BMPs inspected,
 - 2) Locations of BMPs that need maintenance,
 - 3) Locations of BMPs that failed to operate as designed or intended, and
 - 4) Locations of where additional or different BMPs are required.
 - Visual monitoring results, including a description of discharged stormwater. The presence of suspended sediment, turbid water, discoloration, and oil sheen shall be noted, as applicable.
 - Any water quality monitoring performed during inspection.
 - General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.
- Facilitate, participate in, and take corrective actions resulting from inspections performed by outside agencies or the owner.

BMP C162: Scheduling

<i>Purpose</i>	Sequencing a construction project reduces the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking.
<i>Conditions of Use</i>	The construction sequence schedule is an orderly listing of all major land-disturbing activities together with the necessary erosion and sedimentation control measures planned for the project. This type of schedule guides the contractor on work to be done before other work is started so that serious erosion and sedimentation problems can be avoided. Following a specified work schedule that coordinates the timing of land-disturbing activities and the installation of control measures is perhaps the most cost-effective way of controlling erosion during construction. The removal of surface ground cover leaves a site vulnerable to accelerated erosion. Construction procedures that limit land clearing, provide timely installation of erosion and sedimentation controls, and restore protective cover quickly can significantly reduce the erosion potential of a site.
<i>Design Considerations</i>	• Avoid rainy periods. • Schedule projects to disturb only small portions of the site at any one time. Complete grading as soon as possible. Immediately stabilize the disturbed portion before grading the next portion. Practice staged seeding in order to revegetate cut and fill slopes as the work progresses.

BMP C207: Check Dams

Purpose

Construction of small dams across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam.

Conditions of Use

Where temporary channels or permanent channels are not yet vegetated, channel lining is infeasible, and velocity checks are required.

- Check dams may not be placed in streams unless approved by the State Department of Fish and Wildlife. Check dams may not be placed in wetlands without approval from a permitting agency.
- Check dams shall not be placed below the expected backwater from any salmonid bearing water between October 1 and May 31 to ensure that there is no loss of high flow refuge habitat for overwintering juvenile salmonids and emergent salmonid fry.

Design and Installation Specifications

Whatever material is used, the dam should form a triangle when viewed from the side. This prevents undercutting as water flows over the face of the dam rather than falling directly onto the ditch bottom.

Check dams in association with sumps work more effectively at slowing flow and retaining sediment than just a check dam alone. A deep sump should be provided immediately upstream of the check dam.

- In some cases, if carefully located and designed, check dams can remain as permanent installations with very minor regrading. They may be left as either spillways, in which case accumulated sediment would be graded and seeded, or as check dams to prevent further sediment from leaving the site.
- Check dams can be constructed of either rock or pea-gravel filled bags. Numerous new products are also available for this purpose. They tend to be re-usable, quick and easy to install, effective, and cost efficient.
- Check dams should be placed perpendicular to the flow of water.
- The maximum spacing between the dams shall be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.
- Keep the maximum height at 2 feet at the center of the dam.
- Keep the center of the check dam at least 12 inches lower than the outer edges at natural ground elevation.
- Keep the side slopes of the check dam at 2:1 or flatter.
- Key the stone into the ditch banks and extend it beyond the abutments a minimum of 18 inches to avoid washouts from overflow around the dam.

- Use filter fabric foundation under a rock or sand bag check dam. If a blanket ditch liner is used, this is not necessary. A piece of organic or synthetic blanket cut to fit will also work for this purpose.
- Rock check dams shall be constructed of appropriately sized rock. The rock must be placed by hand or by mechanical means (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the dam is lower than the edges. The rock used must be large enough to stay in place given the expected design flow through the channel.
- In the case of grass-lined ditches and swales, all check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale - unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.
- Ensure that channel appurtenances, such as culvert entrances below check dams, are not subject to damage or blockage from displaced stones. Figure 4.13 depicts a typical rock check dam.

Maintenance Standards

Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall. Sediment shall be removed when it reaches one half the sump depth.

- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel.

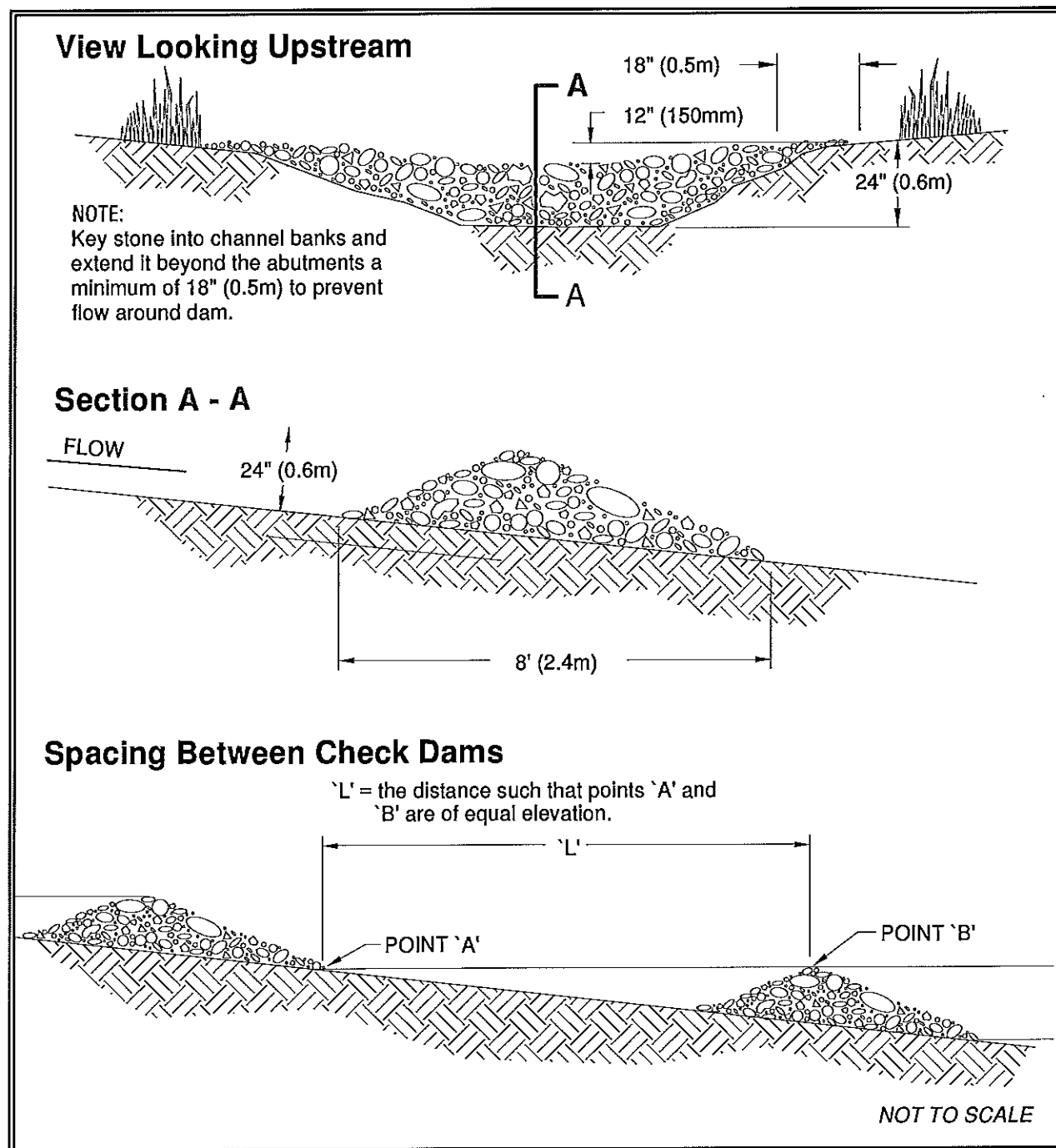


Figure 4.13 – Check Dams

BMP C235: Straw Wattles

Purpose

Straw wattles are temporary erosion and sediment control barriers consisting of straw that is wrapped in biodegradable tubular plastic or similar encasing material. They reduce the velocity and can spread the flow of rill and sheet runoff, and can capture and retain sediment. Straw wattles are typically 8 to 10 inches in diameter and 25 to 30 feet in length. The wattles are placed in shallow trenches and staked along the contour of disturbed or newly constructed slopes. See Figure 4.21 for typical construction details.

Conditions of Use

- Disturbed areas that require immediate erosion protection.
- Exposed soils during the period of short construction delays, or over winter months.
- On slopes requiring stabilization until permanent vegetation can be established.
- Straw wattles are effective for one to two seasons.
- If conditions are appropriate, wattles can be staked to the ground using willow cuttings for added revegetation.
- Rilling can occur beneath wattles if not properly entrenched and water can pass between wattles if not tightly abutted together.

Design Criteria

- It is critical that wattles are installed perpendicular to the flow direction and parallel to the slope contour.
- Narrow trenches should be dug across the slope on contour to a depth of 3 to 5 inches on clay soils and soils with gradual slopes. On loose soils, steep slopes, and areas with high rainfall, the trenches should be dug to a depth of 5 to 7 inches, or 1/2 to 2/3 of the thickness of the wattle.
- Start building trenches and installing wattles from the base of the slope and work up. Excavated material should be spread evenly along the uphill slope and compacted using hand tamping or other methods.
- Construct trenches at contour intervals of 3 to 30 feet apart depending on the steepness of the slope, soil type, and rainfall. The steeper the slope the closer together the trenches.
- Install the wattles snugly into the trenches and abut tightly end to end. Do not overlap the ends.
- Install stakes at each end of the wattle, and at 4-foot centers along entire length of wattle.
- If required, install pilot holes for the stakes using a straight bar to drive holes through the wattle and into the soil.
- At a minimum, wooden stakes should be approximately 3/4 x 3/4 x 24 inches. Willow cuttings or 3/8-inch rebar can also be used for stakes.

Maintenance Standards

- Stakes should be driven through the middle of the wattle, leaving 2 to 3 inches of the stake protruding above the wattle.
- Wattles may require maintenance to ensure they are in contact with soil and thoroughly entrenched, especially after significant rainfall on steep sandy soils.
- Inspect the slope after significant storms and repair any areas where wattles are not tightly abutted or water has scoured beneath the wattles.

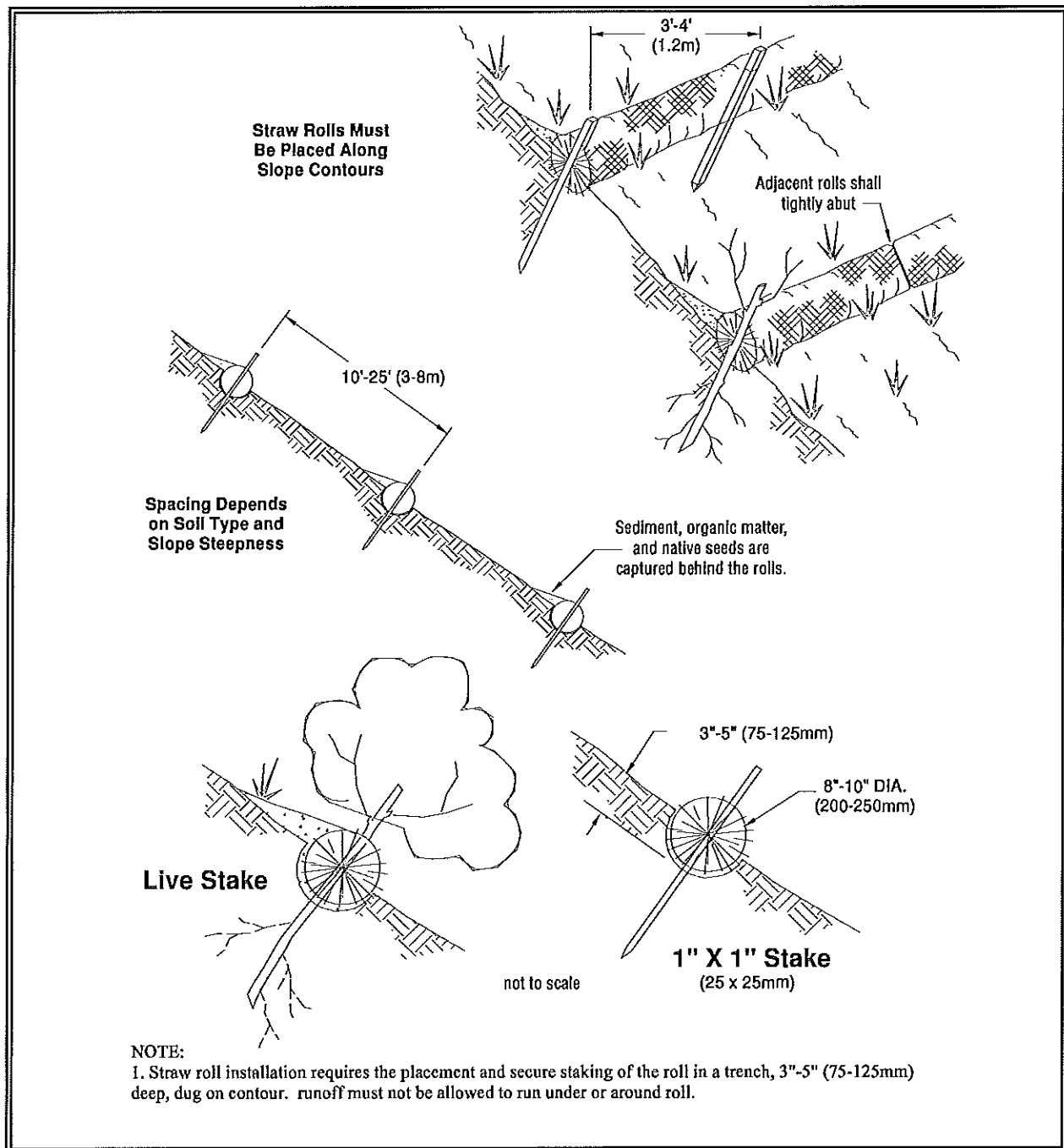


Figure 4.21 – Straw Wattles

BMP C240: Sediment Trap

Purpose

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites cleared and/or graded during construction. Sediment traps, along with other perimeter controls, shall be installed before any land disturbance takes place in the drainage area.

Conditions of Use

Prior to leaving a construction site, stormwater runoff must pass through a sediment pond or trap or other appropriate sediment removal best management practice. Non-engineered sediment traps may be used on-site prior to an engineered sediment trap or sediment pond to provide additional sediment removal capacity.

It is intended for use on sites where the tributary drainage area is less than 3 acres, with no unusual drainage features, and a projected build-out time of six months or less. The sediment trap is a temporary measure (with a design life of approximately 6 months) and shall be maintained until the site area is permanently protected against erosion by vegetation and/or structures.

Sediment traps and ponds are only effective in removing sediment down to about the medium silt size fraction. Runoff with sediment of finer grades (fine silt and clay) will pass through untreated, emphasizing the need to control erosion to the maximum extent first.

Whenever possible, sediment-laden water shall be discharged into onsite, relatively level, vegetated areas (see BMP C234 – Vegetated Strip). This is the only way to effectively remove fine particles from runoff unless chemical treatment or filtration is used. This can be particularly useful after initial treatment in a sediment trap or pond. The areas of release must be evaluated on a site-by-site basis in order to determine appropriate locations for and methods of releasing runoff. Vegetated wetlands shall not be used for this purpose. Frequently, it may be possible to pump water from the collection point at the downhill end of the site to an upslope vegetated area. Pumping shall only augment the treatment system, not replace it, because of the possibility of pump failure or runoff volume in excess of pump capacity.

All projects that are constructing permanent facilities for runoff quantity control should use the rough-graded or final-graded permanent facilities for traps and ponds. This includes combined facilities and infiltration facilities. When permanent facilities are used as temporary sedimentation facilities, the surface area requirement of a sediment trap or pond must be met. If the surface area requirements are larger than the surface area of the permanent facility, then the trap or pond shall be enlarged to comply with the surface area requirement. The permanent pond shall also be divided into two cells as required for sediment ponds.

Either a permanent control structure or the temporary control structure (described in BMP C241, Temporary Sediment Pond) can be used. If a permanent control structure is used, it may be advisable to partially restrict the lower orifice with gravel to increase residence time while still allowing dewatering of the pond. A shut-off valve may be added to the control structure to allow complete retention of stormwater in emergency situations. In this case, an emergency overflow weir must be added.

A skimmer may be used for the sediment trap outlet if approved by the Local Permitting Authority.

Design and Installation Specifications

- See Figures 4.22 and 4.23 for details.
- If permanent runoff control facilities are part of the project, they should be used for sediment retention.
- To determine the sediment trap geometry, first calculate the design surface area (SA) of the trap, measured at the invert of the weir. Use the following equation:

$$SA = FS(Q_2/V_s)$$

where

Q_2 = Design inflow based on the peak discharge from the developed 2-year runoff event from the contributing drainage area as computed in the hydrologic analysis. The 10-year peak flow shall be used if the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection. If no hydrologic analysis is required, the Rational Method may be used.

V_s = The settling velocity of the soil particle of interest. The 0.02 mm (medium silt) particle with an assumed density of 2.65 g/cm³ has been selected as the particle of interest and has a settling velocity (V_s) of 0.00096 ft/sec.

FS = A safety factor of 2 to account for non-ideal settling.

Therefore, the equation for computing surface area becomes:

$$SA = 2 \times Q_2 / 0.00096 \text{ or}$$

2080 square feet per cfs of inflow

Note: Even if permanent facilities are used, they must still have a surface area that is at least as large as that derived from the above formula. If they do not, the pond must be enlarged.

- To aid in determining sediment depth, all sediment traps shall have a staff gauge with a prominent mark 1-foot above the bottom of the trap.

- Sediment traps may not be feasible on utility projects due to the limited work space or the short-term nature of the work. Portable tanks may be used in place of sediment traps for utility projects.

Maintenance Standards

- Sediment shall be removed from the trap when it reaches 1-foot in depth.
- Any damage to the pond embankments or slopes shall be repaired.

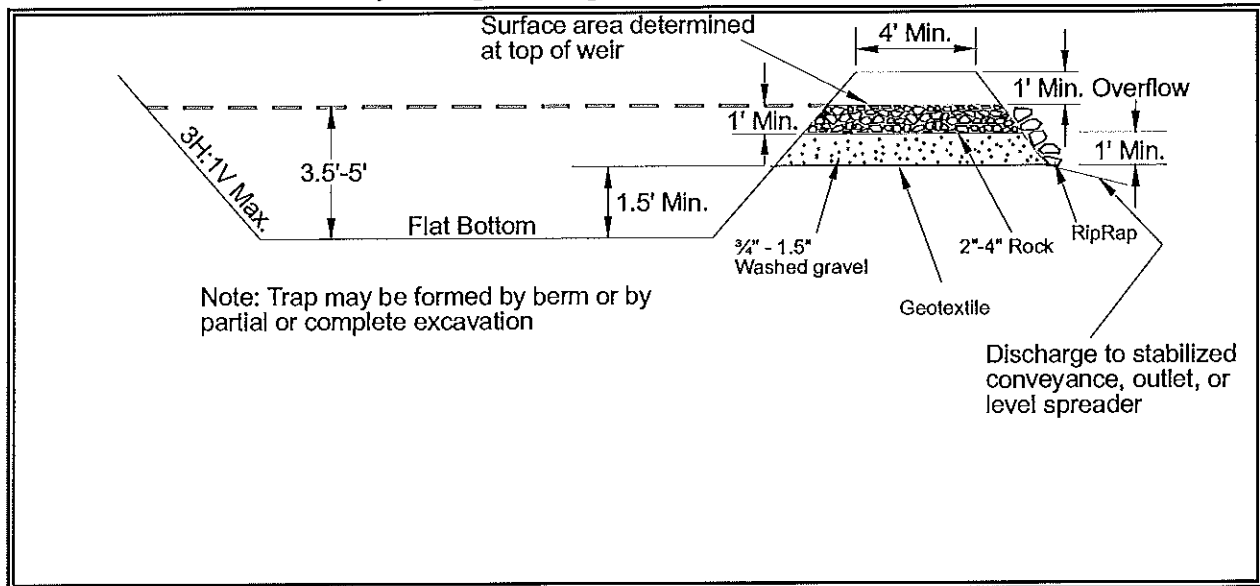


Figure 4.22 Cross Section of Sediment Trap

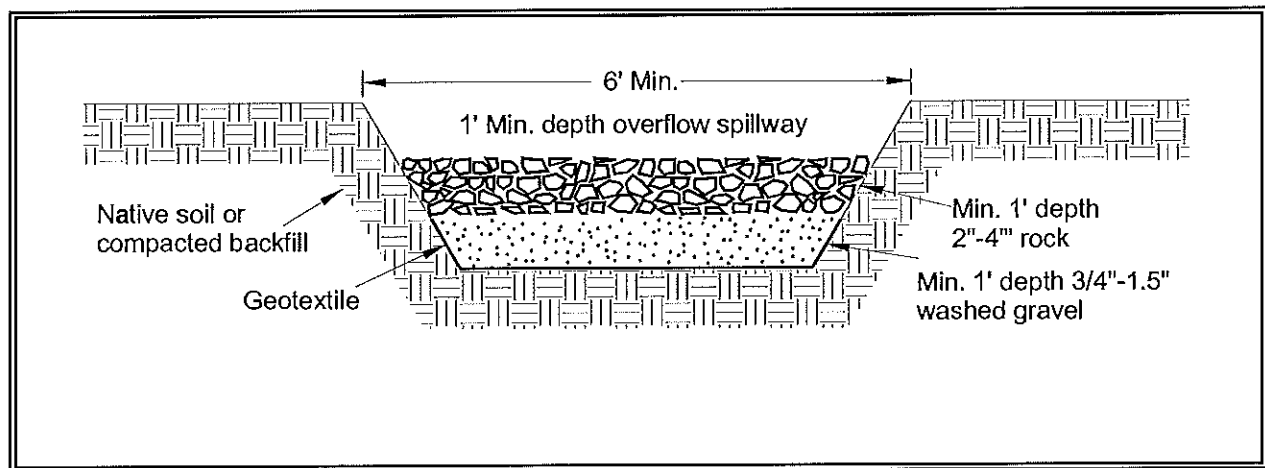


Figure 4.23 Sediment Trap Outlet

BMP C251: Construction Stormwater Filtration

<i>Purpose</i>	Filtration removes sediment from runoff originating from disturbed areas of the site.
<i>Conditions of Use</i>	Traditional BMPs used to control soil erosion and sediment loss from sites under development may not be adequate to ensure compliance with the water quality standard for turbidity in the receiving water. Filtration may be used in conjunction with gravity settling to remove sediment as small as fine silt (0.5 μm). The reduction in turbidity will be dependent on the particle size distribution of the sediment in the stormwater. In some circumstances, sedimentation and filtration may achieve compliance with the water quality standard for turbidity. Unlike chemical treatment, the use of construction stormwater filtration does not require approval from Ecology. Filtration may also be used in conjunction with polymer treatment in a portable system to assure capture of the flocculated solids.
<i>Design and Installation Specifications</i>	<i>Background Information</i> Filtration with sand media has been used for over a century to treat water and wastewater. The use of sand filtration for treatment of stormwater has developed recently, generally to treat runoff from streets, parking lots, and residential areas. The application of filtration to construction stormwater treatment is currently under development. Two types of filtration systems may be applied to construction stormwater treatment: rapid and slow. Rapid sand filters are the typical system used for water and wastewater treatment. They can achieve relatively high hydraulic flow rates, on the order of 2 to 20 gpm/sf, because they have automatic backwash systems to remove accumulated solids. In contrast, slow sand filters have very low hydraulic rates, on the order of 0.02 gpm/sf, because they do not have backwash systems. To date, slow sand filtration has generally been used to treat stormwater. Slow sand filtration is mechanically simple in comparison to rapid sand filtration but requires a much larger filter area. Filtration Equipment. Sand media filters are available with automatic backwashing features that can filter to 50 μm particle size. Screen or bag filters can filter down to 5 μm. Fiber wound filters can remove particles down to 0.5 μm. Filters should be sequenced from the largest to the smallest pore opening. Sediment removal efficiency will be related to particle size distribution in the stormwater. Treatment Process Description. Stormwater is collected at interception point(s) on the site and is diverted to a sediment pond or tank for removal of large sediment and storage of the stormwater before it is treated by the

filtration system. The stormwater is pumped from the trap, pond, or tank through the filtration system in a rapid sand filtration system. Slow sand filtration systems are designed as flow through systems using gravity.

If large volumes of concrete are being poured, pH adjustment may be necessary.

Maintenance Standards

Rapid sand filters typically have automatic backwash systems that are triggered by a pre-set pressure drop across the filter. If the backwash water volume is not large or substantially more turbid than the stormwater stored in the holding pond or tank, backwash return to the pond or tank may be appropriate. However, land application or another means of treatment and disposal may be necessary.

- Screen, bag, and fiber filters must be cleaned and/or replaced when they become clogged.
- Sediment shall be removed from the storage and/or treatment ponds as necessary. Typically, sediment removal is required once or twice during a wet season and at the decommissioning of the ponds.

BMPs for Urban Streets

Description of Pollutant Sources: Streets can be the sources of vegetative debris, paper, fine dust, vehicle liquids, tire wear residues, heavy metals (lead and zinc), soil particles, ice control salts, domestic wastes, lawn chemicals, and vehicle combustion products. Street surface contaminants have been found to contain significant concentrations of particle sizes less than 250 microns. (Sartor and Boyd, 1972)

Pollutant Control Approach: Conduct efficient street sweeping where and when appropriate to minimize the contamination of stormwater. Do not wash street debris into storm drains.

Recommended BMPs:

- For maximum stormwater pollutant reductions on curbed streets and high volume parking lots use efficient vacuum sweepers (refer to Volume V, Ch. 12, for information about an emerging high-efficiency vacuum sweeper technology).

Note: High-efficiency street sweepers utilize strong vacuums and the mechanical action of main and gutter brooms combined with an air filtration system that only returns clean air to the atmosphere (i.e., filters very fine particulates). They sweep dry and use no water since they do not emit any dust.

It has been reported that high-efficiency vacuum sweepers have the capability of removing, from pavements under good condition, 80 percent or more of the accumulated street dirt particles whose diameters are less than 250 microns. (Sutherland, 1998) This assumes pavements under good condition and reasonably expected accumulation conditions.

- For moderate stormwater pollutant reductions on curbed streets use regenerative air sweepers or tandem sweeping operations.

Note: A tandem sweeping operation involves a single pass of a mechanical sweeper followed immediately by a single pass of a vacuum sweeper or regenerative air sweeper.

- *A regenerative air sweeper blows air down on the pavement to entrain particles and uses a return vacuum to transport the material to the hopper.*
- *These operations usually use water to control dust. This reduces their ability to pick up fine particulates.*

It has been reported that these types of sweepers have the capability of removing approximately 25 to 50 percent of the accumulated street dirt particles whose diameters are less than 250 microns. (Sutherland, 1998) This assumes pavements under good conditions and typical accumulation conditions.

- For minimal stormwater pollutant reductions on curbed streets us use mechanical sweepers.
 - Note: *Mechanical sweepers are referred to as broom sweepers and use the mechanical action of main and gutter brooms to throw material on a conveyor belt that transports it to the hopper.*
 - *These sweepers usually use water to control dust. This reduces their ability to pick up fine particulates.*

It has been reported that mechanical sweepers have the capability of removing only 10 to 20 percent of the accumulated street dirt particles whose diameters are less than 250 microns. (Sutherland, 1998) This assumes pavements under good condition and the most favorable accumulation conditions.

- Conduct sweeping at optimal frequencies. Optimal frequencies are those scheduled sweeping intervals that produce the most cost-effective annual reduction of pollutants normally found in stormwater and can vary depending on land use, traffic volume and rainfall patterns.
- Train operators in those factors that result in optimal pollutant removal. These factors include sweeper speed, brush adjustment and rotation rate, sweeping pattern, maneuvering around parked vehicles, and interim storage and disposal methods.
- Consider the use of periodic parking restrictions in low to medium density single-family residential areas to ensure the sweeper's ability to sweep along the curb.
- Establish programs for prompt sweeping, removal, and disposal of debris from special events that will generate higher than normal loadings.
- Disposal of street sweeping solids must comply with "Recommendations for Management of Street Wastes" described in Appendix IV-G of this volume.
- Inform citizens about eliminating yard debris, oil and other wastes in street gutters to reduce street pollutant sources.

Alternative BMP's

BMP C102: Buffer Zones

<i>Purpose</i>	An undisturbed area or strip of natural vegetation or an established suitable planting that will provide a living filter to reduce soil erosion and runoff velocities.
<i>Conditions of Use</i>	Natural buffer zones are used along streams, wetlands and other bodies of water that need protection from erosion and sedimentation. Vegetative buffer zones can be used to protect natural swales and can be incorporated into the natural landscaping of an area. Critical-areas buffer zones should not be used as sediment treatment areas. These areas shall remain completely undisturbed. The local permitting authority may expand the buffer widths temporarily to allow the use of the expanded area for removal of sediment.
<i>Design and Installation Specifications</i>	• Preserving natural vegetation or plantings in clumps, blocks, or strips is generally the easiest and most successful method. • Leave all unstable steep slopes in natural vegetation. • Mark clearing limits and keep all equipment and construction debris out of the natural areas. Steel construction fencing is the most effective method in protecting sensitive areas and buffers. Alternatively, wire-backed silt fence on steel posts is marginally effective. Flagging alone is typically not effective. • Keep all excavations outside the dripline of trees and shrubs. • Do not push debris or extra soil into the buffer zone area because it will cause damage from burying and smothering. • Vegetative buffer zones for streams, lakes or other waterways shall be established by the local permitting authority or other state or federal permits or approvals.
<i>Maintenance Standards</i>	• Inspect the area frequently to make sure flagging remains in place and the area remains undisturbed.

BMP C122: Nets and Blankets

Purpose

Erosion control nets and blankets are intended to prevent erosion and hold seed and mulch in place on steep slopes and in channels so that vegetation can become well established. In addition, some nets and blankets can be used to permanently reinforce turf to protect drainage ways during high flows. Nets (commonly called matting) are strands of material woven into an open, but high-tensile strength net (for example, coconut fiber matting). Blankets are strands of material that are not tightly woven, but instead form a layer of interlocking fibers, typically held together by a biodegradable or photodegradable netting (for example, excelsior or straw blankets). They generally have lower tensile strength than nets, but cover the ground more completely. Coir (coconut fiber) fabric comes as both nets and blankets.

Conditions of Use

Erosion control nets and blankets should be used:

- To aid permanent vegetated stabilization of slopes 2H:1V or greater and with more than 10 feet of vertical relief.
- For drainage ditches and swales (highly recommended). The application of appropriate netting or blanket to drainage ditches and swales can protect bare soil from channelized runoff while vegetation is established. Nets and blankets also can capture a great deal of sediment due to their open, porous structure. Synthetic nets and blankets can be used to permanently stabilize channels and may provide a cost-effective, environmentally preferable alternative to riprap. 100 percent synthetic blankets manufactured for use in ditches may be easily reused as temporary ditch liners.

Disadvantages of blankets include:

- Surface preparation required;
- On slopes steeper than 2.5:1, blanket installers may need to be roped and harnessed for safety;
- They cost at least \$4,000-6,000 per acre installed.

Advantages of blankets include:

- Can be installed without mobilizing special equipment;
- Can be installed by anyone with minimal training;
- Can be installed in stages or phases as the project progresses;
- Seed and fertilizer can be hand-placed by the installers as they progress down the slope;
- Can be installed in any weather;
- There are numerous types of blankets that can be designed with various parameters in mind. Those parameters include: fiber blend, mesh strength, longevity, biodegradability, cost, and availability.

BMP C124: Sodding

<i>Purpose</i>	The purpose of sodding is to establish permanent turf for immediate erosion protection and to stabilize drainage ways where concentrated overland flow will occur.
<i>Conditions of Use</i>	Sodding may be used in the following areas: • Disturbed areas that require short-term or long-term cover. • Disturbed areas that require immediate vegetative cover. • All waterways that require vegetative lining. Waterways may also be seeded rather than sodded, and protected with a net or blanket.
<i>Design and Installation Specifications</i>	Sod shall be free of weeds, of uniform thickness (approximately 1-inch thick), and shall have a dense root mat for mechanical strength. The following steps are recommended for sod installation: • Shape and smooth the surface to final grade in accordance with the approved grading plan. The swale needs to be overexcavated 4 to 6 inches below design elevation to allow room for placing soil amendment and sod. • Amend 4 inches (minimum) of compost into the top 8 inches of the soil if the organic content of the soil is less than ten percent or the permeability is less than 0.6 inches per hour. Compost used should meet Ecology publication 94-038 specifications for Grade A quality compost. • Fertilize according to the supplier's recommendations. • Work lime and fertilizer 1 to 2 inches into the soil, and smooth the surface. • Lay strips of sod beginning at the lowest area to be sodded and perpendicular to the direction of water flow. Wedge strips securely into place. Square the ends of each strip to provide for a close, tight fit. Stagger joints at least 12 inches. Staple on slopes steeper than 3H:1V. Staple the upstream edge of each sod strip. • Roll the sodded area and irrigate. • When sodding is carried out in alternating strips or other patterns, seed the areas between the sod immediately after sodding.
<i>Maintenance Standards</i>	If the grass is unhealthy, the cause shall be determined and appropriate action taken to reestablish a healthy groundcover. If it is impossible to establish a healthy groundcover due to frequent saturation, instability, or some other cause, the sod shall be removed, the area seeded with an appropriate mix, and protected with a net or blanket.

4.2 Runoff Conveyance and Treatment BMPs

BMP C200: Interceptor Dike and Swale

Purpose Provide a ridge of compacted soil, or a ridge with an upslope swale, at the top or base of a disturbed slope or along the perimeter of a disturbed construction area to convey stormwater. Use the dike and/or swale to intercept the runoff from unprotected areas and direct it to areas where erosion can be controlled. This can prevent storm runoff from entering the work area or sediment-laden runoff from leaving the construction site.

Conditions of Use Where the runoff from an exposed site or disturbed slope must be conveyed to an erosion control facility which can safely convey the stormwater.

**Design and
Installation
Specifications**

- Locate upslope of a construction site to prevent runoff from entering disturbed area.
- When placed horizontally across a disturbed slope, it reduces the amount and velocity of runoff flowing down the slope.
- Locate downslope to collect runoff from a disturbed area and direct it to a sediment basin.
- Dike and/or swale and channel must be stabilized with temporary or permanent vegetation or other channel protection during construction.
- Channel requires a positive grade for drainage; steeper grades require channel protection and check dams.
- Review construction for areas where overtopping may occur.
- Can be used at top of new fill before vegetation is established.
- May be used as a permanent diversion channel to carry the runoff.
- Sub-basin tributary area should be one acre or less.
- Design capacity for the peak flow from a 10-year, 24-hour storm, assuming a Type 1A rainfall distribution, for temporary facilities. Alternatively, use 1.6 times the 10-year, 1-hour flow indicated by an approved continuous runoff model. For facilities that will also serve on a permanent basis, consult the local government's drainage requirements.

Interceptor dikes shall meet the following criteria:

Top Width	2 feet minimum.
Height	1.5 feet minimum on berm.
Side Slope	2:1 or flatter.
Grade	Depends on topography, however, dike system minimum is 0.5%, maximum is 1%.
Compaction	Minimum of 90 percent ASTM D698 standard proctor.

Horizontal Spacing of Interceptor Dikes:

Average Slope	Slope Percent	Flowpath Length
20H:1V or less	3-5%	300 feet
(10 to 20)H:1V	5-10%	200 feet
(4 to 10)H:1V	10-25%	100 feet
(2 to 4)H:1V	25-50%	50 feet

Stabilization depends on velocity and reach

Slopes <5% Seed and mulch applied within 5 days of dike construction (*see BMP C121, Mulching*).

Slopes 5 - 40% Dependent on runoff velocities and dike materials. Stabilization should be done immediately using either sod or riprap or other measures to avoid erosion.

- The upslope side of the dike shall provide positive drainage to the dike outlet. No erosion shall occur at the outlet. Provide energy dissipation measures as necessary. Sediment-laden runoff must be released through a sediment trapping facility.
- Minimize construction traffic over temporary dikes. Use temporary cross culverts for channel crossing.

Interceptor swales shall meet the following criteria:

Bottom Width	2 feet minimum; the bottom shall be level.
Depth	1-foot minimum.
Side Slope	2:1 or flatter.
Grade	Maximum 5 percent, with positive drainage to a suitable outlet (such as a sediment pond).
Stabilization	Seed as per <i>BMP C120, Temporary and Permanent Seeding</i> , or <i>BMP C202, Channel Lining</i> , 12 inches thick of riprap pressed into the bank and extending at least 8 inches vertical from the bottom.
• Inspect diversion dikes and interceptor swales once a week and after every rainfall. Immediately remove sediment from the flow area. • Damage caused by construction traffic or other activity must be repaired before the end of each working day.	

Check outlets and make timely repairs as needed to avoid gully formation. When the area below the temporary diversion dike is permanently stabilized, remove the dike and fill and stabilize the channel to blend with the natural surface.

BMP C208: Triangular Silt Dike (Geotextile-Encased Check Dam)

<i>Purpose</i>	Triangular silt dikes may be used as check dams, for perimeter protection, for temporary soil stockpile protection, for drop inlet protection, or as a temporary interceptor dike.
<i>Conditions of use</i>	May be used in place of straw bales for temporary check dams in ditches of any dimension. • May be used on soil or pavement with adhesive or staples. • TSDs have been used to build temporary: 1. sediment ponds; 2. diversion ditches; 3. concrete wash out facilities; 4. curbing; 5. water bars; 6. level spreaders; and, 7. berms.
<i>Design and Installation Specifications</i>	Made of urethane foam sewn into a woven geosynthetic fabric. It is triangular, 10 inches to 14 inches high in the center, with a 20-inch to 28-inch base. A 2-foot apron extends beyond both sides of the triangle along its standard section of 7 feet. A sleeve at one end allows attachment of additional sections as needed. • Install with ends curved up to prevent water from flowing around the ends. • The fabric flaps and check dam units are attached to the ground with wire staples. Wire staples should be No. 11 gauge wire and should be 200 mm to 300 mm in length. • When multiple units are installed, the sleeve of fabric at the end of the unit shall overlap the abutting unit and be stapled. • Check dams should be located and installed as soon as construction will allow. • Check dams should be placed perpendicular to the flow of water. • When used as check dams, the leading edge must be secured with rocks, sandbags, or a small key slot and staples. • In the case of grass-lined ditches and swales, check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.
<i>Maintenance Standards</i>	• Triangular silt dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall.

Sediment shall be removed when it reaches one half the height of the dam.

- Anticipate submergence and deposition above the triangular silt dam and erosion from high flows around the edges of the dam. Immediately repair any damage or any undercutting of the dam.

BMP C233: Silt Fence

Purpose

Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow. See Figure 4.19 for details on silt fence construction.

Conditions of Use

Silt fence may be used downslope of all disturbed areas.

- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Any concentrated flows must be conveyed through the drainage system to a sediment pond. The only circumstance in which overland flow can be treated solely by a silt fence, rather than by a sediment pond, is when the area draining to the fence is one acre or less and flow rates are less than 0.5 cfs.
- Silt fences should not be constructed in streams or used in V-shaped ditches. They are not an adequate method of silt control for anything deeper than sheet or overland flow.

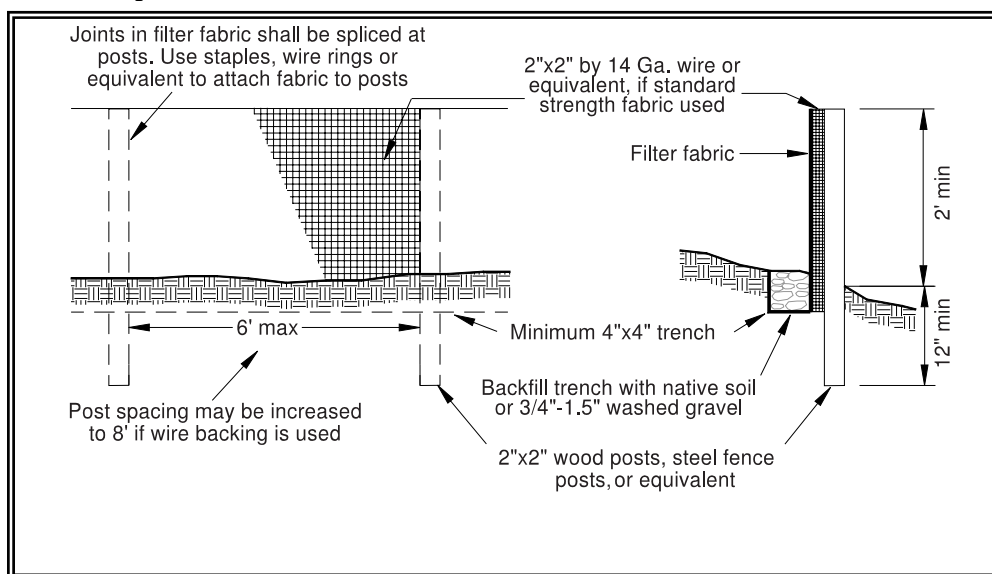


Figure 4.19 – Silt Fence

Design and Installation Specifications

- Drainage area of 1 acre or less or in combination with sediment basin in a larger site.
- Maximum slope steepness (normal (perpendicular) to fence line) 1:1.
- Maximum sheet or overland flow path length to the fence of 100 feet.
- No flows greater than 0.5 cfs.
- The geotextile used shall meet the following standards. All geotextile properties listed below are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in Table 4.10):

Table 4.10 Geotextile Standards	
Polymeric Mesh AOS (ASTM D4751)	0.60 mm maximum for slit film wovens (#30 sieve). 0.30 mm maximum for all other geotextile types (#50 sieve). 0.15 mm minimum for all fabric types (#100 sieve).
Water Permittivity (ASTM D4491)	0.02 sec ⁻¹ minimum
Grab Tensile Strength (ASTM D4632)	180 lbs. Minimum for extra strength fabric. 100 lbs minimum for standard strength fabric.
Grab Tensile Strength (ASTM D4632)	30% maximum
Ultraviolet Resistance (ASTM D4355)	70% minimum

- Standard strength fabrics shall be supported with wire mesh, chicken wire, 2-inch x 2-inch wire, safety fence, or jute mesh to increase the strength of the fabric. Silt fence materials are available that have synthetic mesh backing attached.
- Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F. to 120°F.
- 100 percent biodegradable silt fence is available that is strong, long lasting, and can be left in place after the project is completed, if permitted by local regulations.
- Standard Notes for construction plans and specifications follow. Refer to Figure 4.19 for standard silt fence details.

The contractor shall install and maintain temporary silt fences at the locations shown in the Plans. The silt fences shall be constructed in the areas of clearing, grading, or drainage prior to starting those activities. A silt fence shall not be considered temporary if the silt fence must function beyond the life of the contract. The silt fence shall prevent soil carried by runoff water from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.

The minimum height of the top of silt fence shall be 2 feet and the maximum height shall be 2½ feet above the original ground surface.

The geotextile shall be sewn together at the point of manufacture, or at an approved location as determined by the Engineer, to form geotextile lengths as required. All sewn seams shall be located at a support post. Alternatively, two sections of silt fence can be overlapped, provided the Contractor can demonstrate, to the satisfaction of the Engineer, that the overlap is long enough and that the adjacent fence sections are close enough together to prevent silt laden water from escaping through the fence at the overlap.

The geotextile shall be attached on the up-slope side of the posts and support system with staples, wire, or in accordance with the manufacturer's recommendations. The geotextile shall be attached to the posts in a manner that reduces the potential for geotextile tearing at the staples, wire, or other connection device. Silt fence back-up support for the geotextile in the form of a wire or plastic mesh is dependent on the properties of the geotextile selected for use. If wire or plastic back-up mesh is used, the mesh shall be fastened securely to the up-slope of the posts with the geotextile being up-slope of the mesh back-up support.

The geotextile at the bottom of the fence shall be buried in a trench to a minimum depth of 4 inches below the ground surface. The trench shall be backfilled and the soil tamped in place over the buried portion of the geotextile, such that no flow can pass beneath the fence and scouring can not occur. When wire or polymeric back-up support mesh is used, the wire or polymeric mesh shall extend into the trench a minimum of 3 inches.

The fence posts shall be placed or driven a minimum of 18 inches. A minimum depth of 12 inches is allowed if topsoil or other soft subgrade soil is not present and a minimum depth of 18 inches cannot be reached. Fence post depths shall be increased by 6 inches if the fence is located on slopes of 3:1 or steeper and the slope is perpendicular to the fence. If required post depths cannot be obtained, the posts shall be adequately secured by bracing or guying to prevent overturning of the fence due to sediment loading.

Silt fences shall be located on contour as much as possible, except at the ends of the fence, where the fence shall be turned uphill such that the silt fence captures the runoff water and prevents water from flowing around the end of the fence.

If the fence must cross contours, with the exception of the ends of the fence, gravel check dams placed perpendicular to the back of the fence shall be used to minimize concentrated flow and erosion along the back of the fence. The gravel check dams shall be approximately 1-foot deep at the back of the fence. It shall be continued perpendicular to the fence at the same elevation until the top of the check dam intercepts the ground surface behind the fence. The gravel check dams shall consist of crushed surfacing base course, gravel backfill for walls, or shoulder ballast. The gravel check dams shall be located every 10 feet along the fence where the fence must cross contours. The slope of the fence line where contours must be crossed shall not be steeper than 3:1.

Wood, steel or equivalent posts shall be used. Wood posts shall have minimum dimensions of 2 inches by 2 inches by 3 feet minimum length, and shall be free of defects such as knots, splits, or gouges.

Steel posts shall consist of either size No. 6 rebar or larger, ASTM A 120 steel pipe with a minimum diameter of 1-inch, U, T, L, or C shape steel posts with a minimum weight of 1.35 lbs./ft. or other steel posts having equivalent strength and bending resistance to the post sizes listed. The spacing of the support posts shall be a maximum of 6 feet.

Fence back-up support, if used, shall consist of steel wire with a maximum mesh spacing of 2 inches, or a prefabricated polymeric mesh. The strength of the wire or polymeric mesh shall be equivalent to or greater than 180 lbs. grab tensile strength. The polymeric mesh must be as resistant to ultraviolet radiation as the geotextile it supports.

- Silt fence installation using the slicing method specification details follow. Refer to Figure 4.20 for slicing method details.

The base of both end posts must be at least 2 to 4 inches above the top of the silt fence fabric on the middle posts for ditch checks to drain properly. Use a hand level or string level, if necessary, to mark base points before installation.

Install posts 3 to 4 feet apart in critical retention areas and 6 to 7 feet apart in standard applications.

Install posts 24 inches deep on the downstream side of the silt fence, and as close as possible to the fabric, enabling posts to support the fabric from upstream water pressure.

Install posts with the nipples facing away from the silt fence fabric.

Attach the fabric to each post with three ties, all spaced within the top 8 inches of the fabric. Attach each tie diagonally 45 degrees through the fabric, with each puncture at least 1 inch vertically apart. In addition, each tie should be positioned to hang on a post nipple when tightening to prevent sagging.

Wrap approximately 6 inches of fabric around the end posts and secure with 3 ties.

No more than 24 inches of a 36-inch fabric is allowed above ground level.

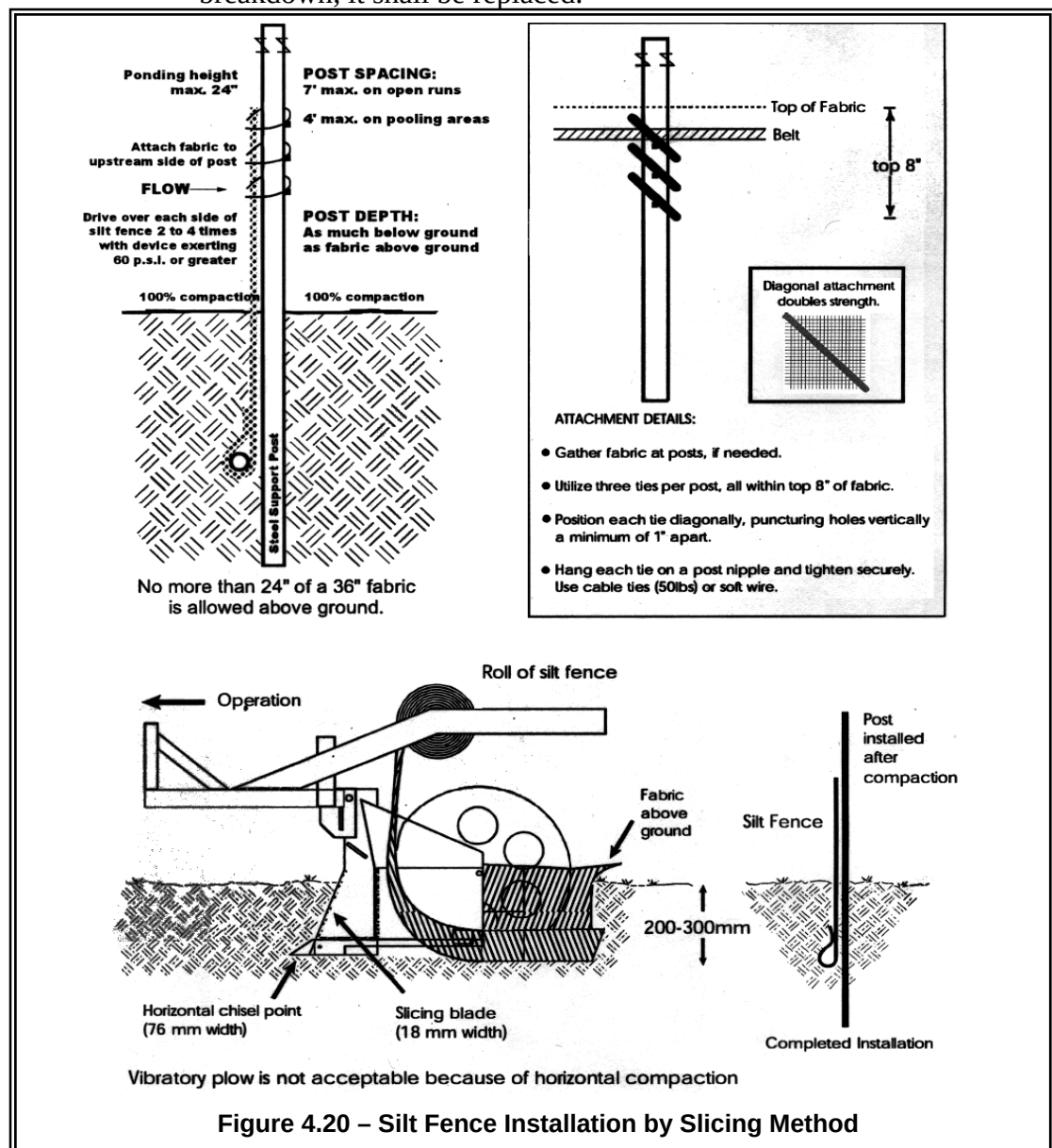
The rope lock system must be used in all ditch check applications.

The installation should be checked and corrected for any deviation before compaction. Use a flat-bladed shovel to tuck fabric deeper into the ground if necessary.

Compaction is vitally important for effective results. Compact the soil immediately next to the silt fence fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first and then each side twice for a total of four trips.

Maintenance Standards

- Any damage shall be repaired immediately.
- If concentrated flows are evident uphill of the fence, they must be intercepted and conveyed to a sediment pond.
- It is important to check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.
- Sediment deposits shall either be removed when the deposit reaches approximately one-third the height of the silt fence, or a second silt fence shall be installed.
- If the filter fabric (geotextile) has deteriorated due to ultraviolet breakdown, it shall be replaced.



BMP C250: Construction Stormwater Chemical Treatment

Purpose

Turbidity is difficult to control once fine particles are suspended in stormwater runoff from a construction site. Sedimentation ponds are effective at removing larger particulate matter by gravity settling, but are ineffective at removing smaller particulates such as clay and fine silt. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm). Chemical treatment may be used to reduce the turbidity of stormwater runoff.

Conditions of Use

Chemical treatment can reliably provide exceptional reductions of turbidity and associated pollutants. Very high turbidities can be reduced to levels comparable to what is found in streams during dry weather. Traditional BMPs used to control soil erosion and sediment loss from sites under development may not be adequate to ensure compliance with the water quality standard for turbidity in the receiving water. Chemical treatment may be required to protect streams from the impact of turbid stormwater discharges, especially when construction is to proceed through the wet season.

Formal written approval from Ecology and the Local Permitting Authority is required for the use of chemical treatment regardless of site size. The intention to use Chemical Treatment shall be indicated on the Notice of Intent for coverage under the General Construction Permit. Chemical treatment systems should be designed as part of the Construction SWPPP, not after the fact. Chemical treatment may be used to correct problem sites in limited circumstances with formal written approval from Ecology and the Local Permitting Authority.

The SEPA review authority must be notified at the application phase of the project review (or the time that the SEPA determination on the project is performed) that chemical treatment is proposed. If it is added after this stage, an addendum will be necessary and may result in project approval delay.

Design and Installation Specifications

See Appendix II-B for background information on chemical treatment.

Criteria for Chemical Treatment Product Use: Chemically treated stormwater discharged from construction sites must be nontoxic to aquatic organisms. The following protocol shall be used to evaluate chemicals proposed for stormwater treatment at construction sites. Authorization to use a chemical in the field based on this protocol does not relieve the applicant from responsibility for meeting all discharge and receiving water criteria applicable to a site.

- Treatment chemicals must be approved by EPA for potable water use.
- Petroleum-based polymers are prohibited.

- Prior to authorization for field use, jar tests shall be conducted to demonstrate that turbidity reduction necessary to meet the receiving water criteria can be achieved. Test conditions, including but not limited to raw water quality and jar test procedures, should be indicative of field conditions. Although these small-scale tests cannot be expected to reproduce performance under field conditions, they are indicative of treatment capability.
- Prior to authorization for field use, the chemically treated stormwater shall be tested for aquatic toxicity. Applicable procedures defined in Chapter 173-205 WAC, Whole Effluent Toxicity Testing and Limits, shall be used. Testing shall use stormwater from the construction site at which the treatment chemical is proposed for use or a water solution using soil from the proposed site.
- The proposed maximum dosage shall be at least a factor of five lower than the no observed effects concentration (NOEC).
- The approval of a proposed treatment chemical shall be conditional, subject to full-scale bioassay monitoring of treated stormwater at the construction site where the proposed treatment chemical is to be used.
- Treatment chemicals that have already passed the above testing protocol do not need to be reevaluated. Contact the Department of Ecology Regional Office for a list of treatment chemicals that have been evaluated and are currently approved for use.

Treatment System Design Considerations: The design and operation of a chemical treatment system should take into consideration the factors that determine optimum, cost-effective performance. It may not be possible to fully incorporate all of the classic concepts into the design because of practical limitations at construction sites. Nonetheless, it is important to recognize the following:

- The right chemical must be used at the right dosage. A dosage that is either too low or too high will not produce the lowest turbidity. There is an optimum dosage rate. This is a situation where the adage “adding more is always better” is not the case.
- The coagulant must be mixed rapidly into the water to insure proper dispersion.
- A flocculation step is important to increase the rate of settling, to produce the lowest turbidity, and to keep the dosage rate as low as possible.
- Too little energy input into the water during the flocculation phase results in flocs that are too small and/or insufficiently dense. Too much energy can rapidly destroy floc as it is formed.

- Since the volume of the basin is a determinant in the amount of energy per unit volume, the size of the energy input system can be too small relative to the volume of the basin.
- Care must be taken in the design of the withdrawal system to minimize outflow velocities and to prevent floc discharge. The discharge should be directed through a physical filter such as a vegetated swale that would catch any unintended floc discharge.

Treatment System Design: Chemical treatment systems shall be designed as batch treatment systems using either ponds or portable trailer-mounted tanks. Flow-through continuous treatment systems are not allowed at this time.

A chemical treatment system consists of the stormwater collection system (either temporary diversion or the permanent site drainage system), a storage pond, pumps, a chemical feed system, treatment cells, and interconnecting piping.

The treatment system shall use a minimum of two lined treatment cells. Multiple treatment cells allow for clarification of treated water while other cells are being filled or emptied. Treatment cells may be ponds or tanks. Ponds with constructed earthen embankments greater than six feet high require special engineering analyses. Portable tanks may also be suitable for some sites.

The following equipment should be located in an operations shed:

- the chemical injector;
- secondary containment for acid, caustic, buffering compound, and treatment chemical;
- emergency shower and eyewash, and
- monitoring equipment which consists of a pH meter and a turbidimeter.

Sizing Criteria: The combination of the storage pond or other holding area and treatment capacity should be large enough to treat stormwater during multiple day storm events. It is recommended that at a minimum the storage pond or other holding area should be sized to hold 1.5 times the runoff volume of the 10-year, 24-hour storm event. Bypass should be provided around the chemical treatment system to accommodate extreme storm events. Runoff volume shall be calculated using the methods presented in Volume 3, Chapter 2. If no hydrologic analysis is required for the site, the Rational Method may be used.

Primary settling should be encouraged in the storage pond. A forebay with access for maintenance may be beneficial.

There are two opposing considerations in sizing the treatment cells. A larger cell is able to treat a larger volume of water each time a batch is

processed. However, the larger the cell the longer the time required to empty the cell. A larger cell may also be less effective at flocculation and therefore require a longer settling time. The simplest approach to sizing the treatment cell is to multiply the allowable discharge flow rate times the desired drawdown time. A 4-hour drawdown time allows one batch per cell per 8-hour work period, given 1 hour of flocculation followed by two hours of settling.

The permissible discharge rate governed by potential downstream effect can be used to calculate the recommended size of the treatment cells. The following discharge flow rate limits shall apply:

- If the discharge is directly or indirectly to a stream, the discharge flow rate shall not exceed 50 percent of the peak flow rate of the 2-year, 24-hour event for all storm events up to the 10-year, 24-hour event.
- If discharge is occurring during a storm event equal to or greater than the 10-year, 24-hour event, the allowable discharge rate is the peak flow rate of the 10-year, 24-hour event.
- Discharge to a stream should not increase the stream flow rate by more than 10 percent.
- If the discharge is directly to a lake, a major receiving water listed in Appendix C of Volume I, or to an infiltration system, there is no discharge flow limit.
- If the discharge is to a municipal storm drainage system, the allowable discharge rate may be limited by the capacity of the public system. It may be necessary to clean the municipal storm drainage system prior to the start of the discharge to prevent scouring solids from the drainage system.
- Runoff rates shall be calculated using the methods presented in Volume 3, Chapter 2 for the predeveloped condition. If no hydrologic analysis is required for the site, the Rational Method may be used.

Maintenance Standards

Monitoring: The following monitoring shall be conducted. Test results shall be recorded on a daily log kept on site:

Operational Monitoring

- pH, conductivity (as a surrogate for alkalinity), turbidity and temperature of the untreated stormwater
- Total volume treated and discharged
- Discharge time and flow rate
- Type and amount of chemical used for pH adjustment
- Amount of polymer used for treatment
- Settling time

Compliance Monitoring

- pH and turbidity of the treated stormwater
- pH and turbidity of the receiving water

Biomonitoring

Treated stormwater shall be tested for acute (lethal) toxicity. Bioassays shall be conducted by a laboratory accredited by Ecology, unless otherwise approved by Ecology. **The performance standard for acute toxicity is no statistically significant difference in survival between the control and 100 percent chemically treated stormwater.**

Acute toxicity tests shall be conducted with the following species and protocols:

- Fathead minnow, *Pimephales promelas* (96 hour static-renewal test, method: EPA/600/4-90/027F). Rainbow trout, *Oncorhynchus mykiss* (96 hour static-renewal test, method: EPA/600/4-90/027F) may be used as a substitute for fathead minnow.
- Daphnid, *Ceriodaphnia dubia*, *Daphnia pulex*, or *Daphnia magna* (48 hour static test, method: EPA/600/4-90/027F).

All toxicity tests shall meet quality assurance criteria and test conditions in the most recent versions of the EPA test method and Ecology Publication # WQ-R-95-80, Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria.

Bioassays shall be performed on the first five batches and on every tenth batch thereafter, or as otherwise approved by Ecology. Failure to meet the performance standard shall be immediately reported to Ecology.

Discharge Compliance: Prior to discharge, each batch of treated stormwater must be sampled and tested for compliance with pH and turbidity limits. These limits may be established by the water quality standards or a site-specific discharge permit. Sampling and testing for other pollutants may also be necessary at some sites. Turbidity must be within 5 NTUs of the background turbidity. Background is measured in the receiving water, upstream from the treatment process discharge point. pH must be within the range of 6.5 to 8.5 standard units and not cause a change in the pH of the receiving water of more than 0.2 standard units. It is often possible to discharge treated stormwater that has a lower turbidity than the receiving water and that matches the pH.

Treated stormwater samples and measurements shall be taken from the discharge pipe or another location representative of the nature of the treated stormwater discharge. Samples used for determining compliance with the water quality standards in the receiving water shall not be taken

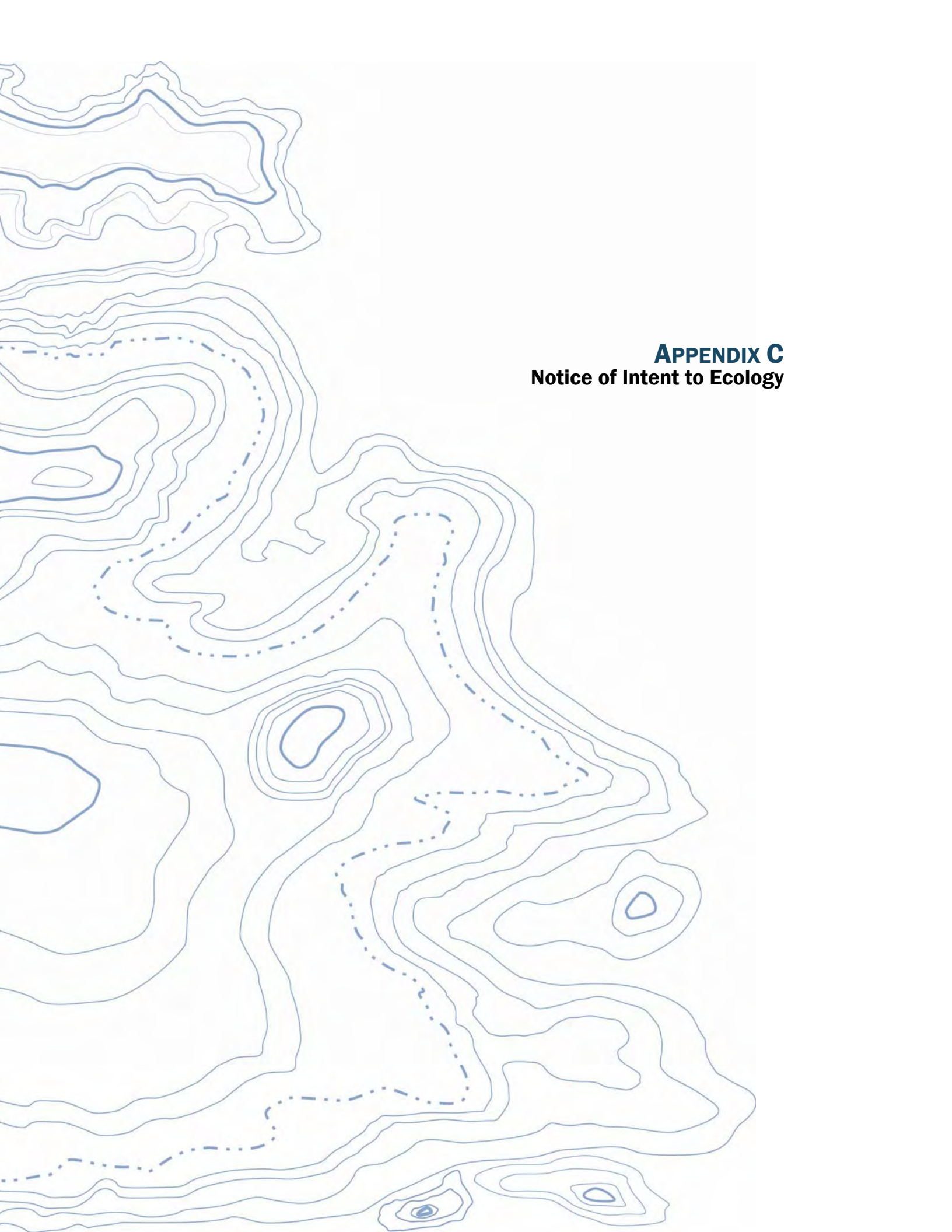
from the treatment pond prior to decanting. Compliance with the water quality standards is determined in the receiving water.

Operator Training: Each contractor who intends to use chemical treatment shall be trained by an experienced contractor on an active site for at least 40 hours.

Standard BMPs: Surface stabilization BMPs should be implemented on site to prevent significant erosion. All sites shall use a truck wheel wash to prevent tracking of sediment off site.

Sediment Removal And Disposal:

- Sediment shall be removed from the storage or treatment cells as necessary. Typically, sediment removal is required at least once during a wet season and at the decommissioning of the cells. Sediment remaining in the cells between batches may enhance the settling process and reduce the required chemical dosage.
- Sediment may be incorporated into the site away from drainages.

A stylized topographic map in shades of blue and grey, featuring contour lines and a dashed line path, serves as the background for the page.

APPENDIX C

Notice of Intent to Ecology



NOTICE OF INTENT (NOI)
APPLICATION FORM

Construction Stormwater General
Permit

Check if applicable:

- ☐ Change or Update Permit Information
☐ Modification of Permit Coverage

Permit #WAR_____

Please print or type all sections of this application. All fields are required unless otherwise marked.

I. Operator/Permittee (Party with operational control over plans and specifications or day-to-day operational control of activities which ensure compliance with Stormwater Pollution Prevention Plan (SWPPP) and permit conditions. Ecology will send correspondence and permit fee invoices to the permittee on record.)				
Name: Sara Young, Manager of Planning and Environmental Services		Company: Port of Skagit County		
Business Phone: (360) 757-0011	Ext. NA	Unified Business Identifier (UBI): 297-004-597 <i>(UBI is a nine-digit number used to identify a business entity. Write "none" if you do not have a UBI number.)</i>		
Cell Phone (Optional):	Fax (Optional):			
E-mail: saray@portofskagit.com				
Mailing Address: Port of Skagit County P.O. Box 348		City: Burlington	State: WA	Zip + 4: 98233
II. Property Owner (The party listed on the County Assessor's records as owner and taxpayer of the parcel[s] for which permit coverage is requested. Ecology will <u>not</u> send correspondence and permit fee invoices to the Property Owner. The Property Owner information will be used for emergency contact purposes.)				
Name: Sara Young, Manager of Planning and Environmental Services		Company (if applicable): Port of Skagit County		
Business Phone: (360) 757-0011	Ext. NA	Unified Business Identifier (UBI): 297-004-597 <i>(UBI is a nine-digit number used to identify a business entity. Write "none" if you do not have a UBI number.)</i>		
Cell Phone (Optional):	Fax (Optional):			
E-mail: saray@portofskagit.com				
Mailing Address: Port of Skagit County P.O. Box 348		City: Burlington	State: WA	Zip + 4: 98233
III. On-site Contact Person (Typically the Certified Erosion & Sediment Control Lead or Operator/Permittee)				
Name: Angela Nelson		Company: GeoEngineers		
Business Phone: (360) 647-1510	Ext.	Mailing Address: 600 Dupont Street		
Cell Phone (Optional) (360) 303-5628	Fax (Optional):	City: Bellingham	State: WA	Zip + 4: 98225
E-mail: anelson@geoengineers.com				
IV. WebDMR (Electronic Discharge Monitoring Reporting)				
You must submit monthly discharge monitoring reports using Ecology's WebDMR system. To sign up for WebDMR, or to register a new site, go to www.ecy.wa.gov/stormwater , and click on the "Construction Stormwater" link. You will find information on WebDMR under the "WebDMR and PARIS" link on the right-hand side. If you are unable to submit your DMRs electronically, you may contact Ecology to request a waiver. Ecology will generally only grant waiver requests to those permittees without internet access. Only a permittee or representative, designated in writing, may request access to or a waiver from WebDMR. To have the ability to use the system immediately, you must submit the Electronic Signature Agreement with your application. If you have questions on this process, contact Ecology's WebDMR staff at WebDMR@ecy.wa.gov or 360-407-7097.				

V. Site Information		
Site or Project Name Taxiway F Site, Skagit Regional Airport, Ecology Agreed Order No. 6158	Site Acreage Total size of your site/project (that <u>you</u> own/control): <u>5</u> acres.	
Street Address or Location Description (If the site lacks a street address, list its specific location. For example, Intersection of Highway 61 and 34.) <u>3200 east of Farm-to-Market Road and 600 feet south of Bayview Road on the western side of the Skagit Regional Airport.</u>	Total area of soil disturbance (grading and/or excavating) for <u>your</u> site/project over the life of the project: <u>2.2</u> acres. (Note: 1 acre = 43,560 ft ² .) Concrete / Engineered Soils How many yards of concrete will be poured over the life of the project? <u>0</u> yd ³ (estimate) How many yards of recycled concrete will be used over the life of the project? <u>0</u> yd ³ (estimate)	
Parcel ID#: <u>21099 and 21102</u> (Optional) Type of Construction Activity (check all that apply): ☐ Residential ☐ Commercial ☐ Industrial ☐ Highway or Road (city ,county, state) ☐ Utilities (specify): _____ ☒ Other (specify): <u>Soil remediation</u>	Will any engineered soils be used? (For example: cement treated base, cement kiln dust, etc.) ☐ Yes ☒ No	
City (or nearest city): Burlington County: Skagit	Zip Code: 98273	Estimated project start-up date (mm/dd/yy): 08/15/11 Estimated project completion date (mm/dd/yy): 10/31/11
Record the latitude and longitude of the <i>main entrance</i> to the site or the approximate center of site. Latitude: <u>48.47051</u> _____ °N Longitude: <u>122.42955</u> _____ °W		
For assistance with latitude and longitude, refer to any of the following websites: www.getlatlon.com or http://www.worldatlas.com/aatlas/imageq.htm . Please convert all latitude and longitude coordinates into decimal degrees format. For help with this process, go to: http://www.fcc.gov/mb/audio/bickel/DDDMSS-decimal.html .		
VI. Existing Site Conditions		
1. Are you aware of contaminated soils present on the site? ☒ Yes ☐ No 2. Are you aware of groundwater contamination located within the site boundary? ☒ Yes ☐ No 3. If you answered yes to questions 1 or 2, will any contaminated soils be disturbed or will any contaminated groundwater be discharged due to the proposed construction activity? ☒ Yes ☐ No		
["Contaminated" and "contamination" here mean containing any hazardous substance (as defined in WAC 173-340-200) that does not occur naturally or occurs at greater than natural background levels.]		
If you answered yes to Question 3, <u>please explain below or on a separate paper</u> in detail the locations, contaminants, and concentrations, and pollution prevention and/or treatment BMPs proposed to control the discharge of soil/groundwater contaminants. Ecology may request a copy of your SWPPP. Construction at the Site is being conducted to implement a Department of Ecology Cleanup Action Plan. Proposed actions at the Taxiway F site include removal of the top 1 - 2 feet of soil contaminated with pesticides, over a 2.2 acre remediation area (JARPA Sheet 2). Soil cleanup levels for the Site were developed as part of the Ecology Cleanup Plan using MTCA Method B standard formula values for unrestricted land use, MTCA Method B soil concentrations protective of groundwater (calculated using Ecology's fixed-parameter, three-phase partitioning model), and Site-specific terrestrial ecological evaluation (TEE) concentrations protective of		

wildlife (calculated using Ecology's wildlife exposure model). In addition to these criteria, natural background soil metals concentrations in Washington state (Ecology, 1994) were considered in accordance with Washington Administrative Code (WAC) 173-340-705(6) and WAC 173-340-709. Within the remediation area, concentrations of several pesticide or herbicide compounds were detected above the cleanup levels in both groundwater and soil.

The Stormwater Pollution Prevention Plan will present and describe recommended and alternate BMP's to control sedimentation of stormwater during the cleanup activities. The most pertinent BMP's will be Project Scheduling and Materials on Hand. It is the intent of the Port to carry out the majority of this project during the dry season and to be prepared for weather that could adversely affect the site during soil excavation. The goal for stormwater management at the site is to not allow stormwater to leave the project area during clean up activities, to the extent practicable. Water quality testing parameters developed in cooperation with Ecology will meet the requirements outlined in the Construction Stormwater General Permit. Additional BMP's for consideration at this site include, check dams, buffer zones, interceptor swales, preserving natural vegetation, mulching, seeding, plastic covering, and dust control. After soil excavation activities are completed and all soil contamination has been verified as removed, stormwater from the project area will be directed towards the surrounding vegetated landscape and will infiltrate into the ground.

Based on results of shallow groundwater (5 feet bgs) monitoring conducted at the site during the summer, groundwater is not anticipated to be encountered during cleanup actions (removal and replacement of the top 1-2 feet of soil). Should water be encountered within the excavations, the contractor will be required to maintain a dry excavation within reason. Measures such as trenches and sumps may be installed within the construction area to contain water. During cleanup actions, stormwater pumped from the trenches will be rerouted within the project area, or stored in tanks and either 1) removed from the site and disposed of according to permit conditions, or 2) treated on-site and released into upland areas adjacent to the remediation area once compliance with water quality standards are met.

VII. Stormwater Pollution Prevention Plan (SWPPP)

You must develop a SWPPP prior to starting construction. Do not submit your SWPPP with your application. The exception is that Ecology may request a copy of your SWPPP if you answered yes to the questions in Part VI.

VIII. Best Management Practices (BMPs)

You must use the BMPs listed in the Stormwater Management Manual for Western Washington or the Stormwater Management Manual for Eastern Washington or other manuals approved by Ecology. Alternatively, you may use demonstrably equivalent BMPs on the basis of permit condition S9.C.4. If you intend to use a BMP at your site that is not included in these manuals, but that you believe meets the definition of a *demonstrably equivalent* BMP, you must notify the appropriate regional office. (See Definitions in the Construction Stormwater General Permit).*

<http://www.ecy.wa.gov/programs/wq/stormwater/construction/contacts.html>

**Note that if you receive permit coverage without indicating the preference for a demonstrably equivalent BMP and later decide to use one, you must provide Ecology with notice of the selection of an equivalent BMP no less than 60 days before the intended use of the equivalent BMP.*

IX. Discharge/Receiving Water Information

Indicate whether your site's stormwater and/or dewatering water could enter surface waters, **directly** and/or **indirectly**:

☒ Water will discharge directly or indirectly (through a storm drain system or roadside ditch) into one or more surface waterbodies (wetlands, creeks, lakes, and all other surface waters and water courses).

If your discharge is to a storm sewer system, provide the name of the operator of the storm sewer system:
(e.g., City of Tacoma): _____

(NOTE: If your stormwater discharges to a storm sewer system operated by the City of Seattle, King County, Snohomish County, City of Tacoma, Pierce County, or Clark County, you must also submit a copy of this NOI to the appropriate jurisdiction.)

☐ Water will discharge to ground with 100% infiltration, with no potential to reach surface waters under any conditions.

If your project includes dewatering, you must include dewatering plans and discharge locations in your site Stormwater Pollution

Prevention Plan.

Location of Discharge into Surface Waterbody

Enter the waterbody name and latitude/longitude of the point(s) where the site has the potential to discharge into a waterbody (enter all locations).

- Include the names and locations of both direct and indirect discharges to surface waterbodies, even if the risk of discharge is low or limited to periods of extreme weather.
- Some large construction projects (for example, subdivisions, roads, or pipelines) may discharge into several waterbodies.
- If the creek or tributary is unnamed, use a format such as "unnamed tributary to Deschutes River."
- Attach a separate list if necessary.

Surface Waterbody Name	Latitude Decimal Degrees	Longitude Decimal Degrees
Wetland areas located within the Project Site	48.47051° N	122.42955° W
	° N	° W
	° N	° W
	° N	° W

If your site discharges to a waterbody that is on the impaired waterbodies list (i.e., 303[d] list) for turbidity, fine sediment, high pH, or phosphorus, Ecology will require additional documentation before issuing permit coverage and these sites will be subject to additional sampling and numeric effluent limits (per Permit Condition S8). Ecology will notify you if any additional sampling requirements apply. Information on impaired waterbodies is available online at: <http://www.ecy.wa.gov/programs/wq/stormwater/construction/impaired.html>.

X. State Environmental Policy Act (SEPA)

This Notice of Intent (NOI) is incomplete and cannot be approved until the applicable SEPA requirements under Chapter 197-11 WAC are met.

Who is the SEPA lead agency on your site? Washington Department of Ecology.

Has the SEPA lead agency issued a final decision on your checklist? ☒ No ☐ Yes ☐ Exempt*

If No: The NOI is incomplete. Ecology will hold the application until a final SEPA decision is made or the Construction Stormwater NOI public comment period ends, whichever is later. You must notify Ecology once the lead agency has issued a determination.

If Yes: Type of SEPA decision issued: ☐ Determination of Non-Significance (DNS) ☐ Mitigated DNS (MDNS) ☐ Determination of Significance (DS) ☐ Final Environmental Impact Statement (EIS) ☐ Other: _____

- Date of final SEPA decision: _____.
- If a supplemental EIS, SEPA addendum, or some other type of additional SEPA review was required, please attach and submit with this form.
- Date when all SEPA-related comment & appeal periods are exhausted: _____.

*If Exempt: Attach written documentation, check type of exemption below, and proceed to Section VII.

- ☐ Watershed Restoration & Fish Habitat Enhancement Exemption (RCW 43.21C.0382).
- ☐ Infill Development Exemption (RCW 43.21C.229).
- ☐ Planned Action Exemption (RCW 43.21C.031).
- ☐ Categorical Exemption. Under what section of the SEPA Rule (WAC 197-11-800) is it exempt? _____ (for example, WAC 197-11-800(1) Minor New Construction)

More SEPA information is available at: <http://www.ecy.wa.gov/programs/sea/sepa/e-review.html>.

XI. Public Notice

You must publish a public notice at least once a week for two consecutive weeks with seven days between publications, in at least a single newspaper of general circulation in the county in which the construction is to take place. Ecology cannot grant permit coverage sooner than the end of the 30-day public comment period, which begins on the date of the second public notice.

Mail or fax (360-407-6426) the NOI to Ecology on or before the first public notice date. If you fax the public notice to Ecology, you must also mail a hard copy. Failure to do so may delay the issuance of your permit.

Provide the exact dates (mm/dd/yy) that the first and second public notices will appear in the newspaper(s):

First notice: 04/05 /2011

Second notice: 04/12 /2011 (Begins 30-day public comment period.)

For example: First notice: 01/01/10

Second notice: 01/08/10

Name of the newspaper(s) publishing the notices: Skagit Valley Herald

PUBLIC NOTICE TEMPLATE

Complete this template using project-specific information and submit to a local newspaper with general circulation within the county where the project is located. The bold language is required by WAC 173-226-130 and must be included in its entirety. (Either use the fill-in template below or attach on a separate sheet of paper, if necessary.)

Port of Skagit, P.O. Box 348, Burlington, 98223, is seeking coverage under the Washington State Department of Ecology's Construction Stormwater NPDES and State Waste Discharge General Permit.

The proposed project, Taxiway F Site Remediation, Skagit Regional Airport, Ecology Agreed Order No. 6158, is located at Taxiway F of the Skagit Regional Airport in Burlington, in Skagit County.

This project involves 2.2 acres of soil disturbance for remediation (removal of contaminated soil) construction activities.

Stormwater from the project area will either infiltrate into the ground inside the project area or be collected and contained in tanks for water quality testing and treatment. Once testing has shown that stormwater meets the water quality standards outlined in the Construction Stormwater General Permit, stormwater will be released to vegetated areas south and west of the project area and will infiltrate into the ground. No surface water bodies are present within the remediation project area or project site.

Any persons desiring to present their views to the Washington State Department of Ecology regarding this application, or interested in Ecology's action on this application, may notify Ecology in writing no later than 30 days of the last date of publication of this notice. Ecology reviews public comments and considers whether discharges from this project would cause a measurable change in receiving water quality, and, if so, whether the project is necessary and in the overriding public interest according to Tier II antidegradation requirements under WAC 173-201A-320.

Comments can be submitted to:

Department of Ecology

Attn: Water Quality Program, Construction Stormwater

P.O. Box 47696, Olympia, WA 98504-7696

XII. Certification of Permittees

"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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those directly responsible for gathering the 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."

Sara Young / Port of Skagit

Manager of Planning and Environmental Services

Printed Name / Company (operator/permittee only)

Title

Signature of Operator/Permittee*

Date

* Federal regulations require this application is signed by one of the following:

- A. For a corporation: By a principal executive officer of at least the level of vice president.
- B. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively.
- C. For a municipality, state, federal, or other public facility: By either a principal executive officer or ranking elected official.

Please sign and return this document to the following address:

Washington Department of Ecology - Stormwater
P.O. Box 47696
Olympia, WA 98504-7696

DO NOT SUBMIT THIS PAGE WITH YOUR APPLICATION

If you have questions about this form, contact the following Ecology staff:

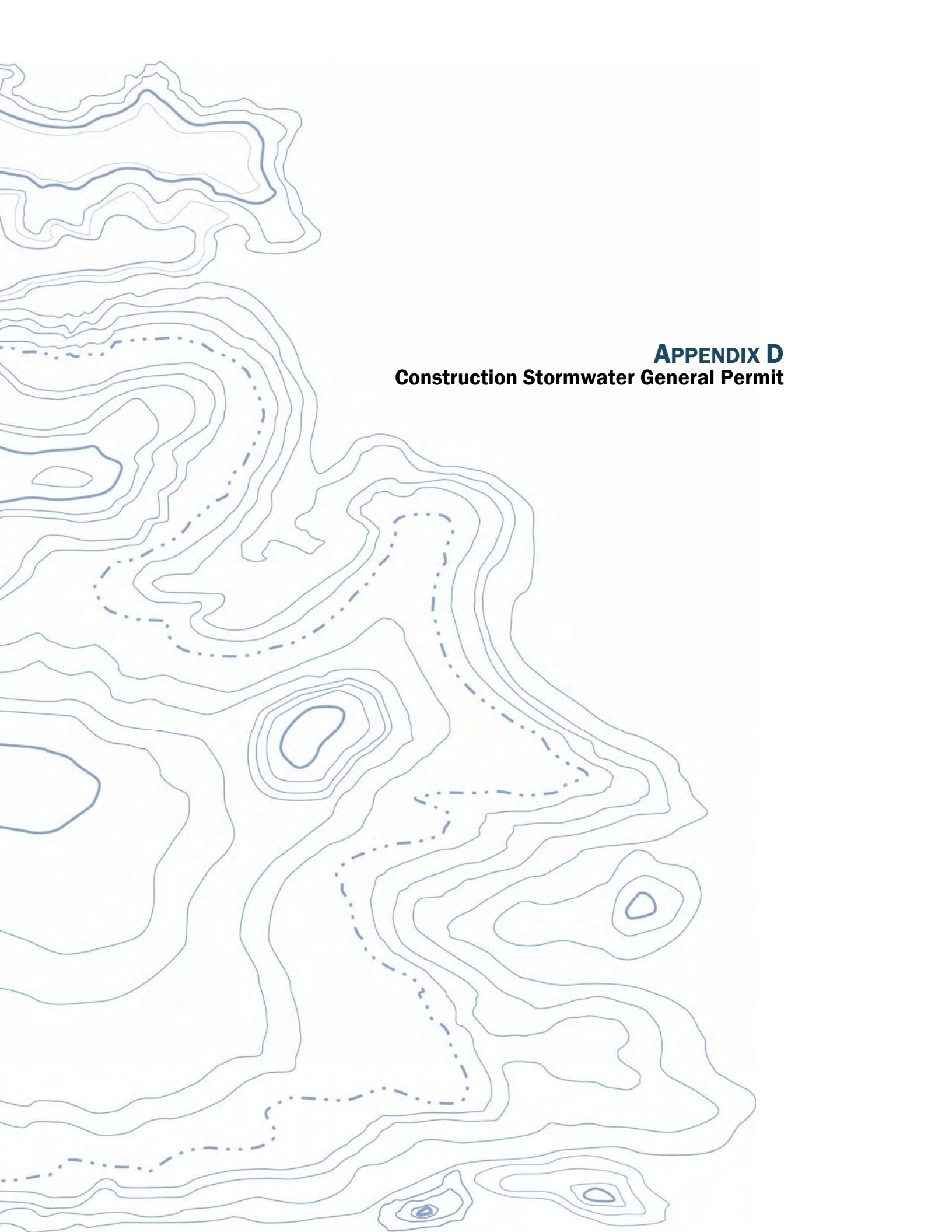
Location	Contact Name	Phone	E-mail
City of Seattle, and Kitsap, Pierce, and Thurston counties	Josh Klimek	360-407-7451	josh.klimek@ecy.wa.gov
Island, King, and San Juan counties	Clay Keown	360-407-6048	clay.keown@ecy.wa.gov
Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Skagit, Snohomish, Spokane, Stevens, Walla, Whatcom, and Whitman counties.	Shawn Hopkins	360-407-6442	shawn.hopkins@ecy.wa.gov
Benton, Chelan, Clallam, Clark, Cowlitz, Douglas, Grays Harbor, Jefferson, Kittitas, Klickitat, Lewis, Mason, Okanogan, Pacific, Skamania, Wahkiakum, and Yakima counties.	Joyce Smith	360-407-6858	joyce.smith@ecy.wa.gov

If you have questions about WebDMR, contact the following Ecology staff:

Permittees must submit discharge monitoring reports (DMRs) each month using Ecology's secure online system, WebDMR. To have the ability to use the system immediately, you must submit the Electronic Signature Agreement with your application. If you have questions on this process, contact Ecology's WebDMR staff at WebDMR@ecy.wa.gov or 360-407-7097.

More information is available at: <http://www.ecy.wa.gov/programs/wq/stormwater/construction/>.

To ask about the availability of this document in a version for the visually impaired, call the Water Quality Program at 360-407-6401. Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877-833-6341.



APPENDIX D
Construction Stormwater General Permit

Issuance Date: December 1, 2010
Effective Date: January 1, 2011
Expiration Date: December 31, 2015

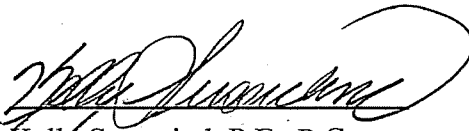
CONSTRUCTION STORMWATER GENERAL PERMIT

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

In compliance with the provisions of
Chapter 90.48 Revised Code of Washington
(State of Washington Water Pollution Control Act)
and
Title 33 United States Code, Section 1251 et seq.
The Federal Water Pollution Control Act (The Clean Water Act)

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 that follow.



Kelly Sussewind, P.E., P.G.
Water Quality Program Manager
Washington State Department of Ecology

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SUMMARY OF PERMIT REPORT SUBMITTALS

Refer to the Special and General Conditions within this permit for additional submittal requirements. Appendix A provides a list of definitions. Appendix B provides a list of acronyms.

Table 1. Summary of Permit Report Submittals

Permit Section	Submittal	Frequency	First Submittal Date
S5.A and S8	High Turbidity/Transparency Phone Reporting	As Necessary	Within 24 hours
S5.B	Discharge Monitoring Report	Monthly*	Within 15 days of applicable monitoring period
S5.F and S8	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	

SPECIAL NOTE: *Permittees must submit Discharge Monitoring Reports (DMRs) to the Washington State Department of Ecology monthly, regardless of site discharge, for the full duration of permit coverage. Refer to Section S5.B of this General Permit for more specific information regarding DMRs.

Table 2. Summary of Required On-site Documentation

Document Title	Permit Conditions
Permit Coverage Letter	See Conditions S2, S5
Construction Stormwater General Permit	See Conditions S2, S5
Site Log Book	See Conditions S4, S5
Stormwater Pollution Prevention Plan (SWPPP)	See Conditions S9, S5

SPECIAL CONDITIONS

S1. PERMIT COVERAGE

A. Permit Area

This Construction Stormwater General Permit (CSWGP) covers all areas of Washington State, except for federal and Tribal lands as specified in Special Condition S1.E.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 CSWGP:
 - a. Clearing, grading and/or excavation that 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 that 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 discharge stormwater to surface waters of the State.
 - i. This includes forest practices (including, but not limited to, class IV conversions) that are part of a construction activity that will result in the disturbance of one or more acres, and discharge to surface waters of the State (that is, forest practices that prepare a site for construction activities); and
 - b. Any size construction activity discharging stormwater to waters of the State that the Department of Ecology (“Ecology”):
 - i. Determines to be a significant contributor of pollutants to waters of the State of Washington.
 - 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 CSWGP (unless specifically required under Special Condition S1.B.1.b. above):
 - a. Construction activities that discharge all stormwater and non-stormwater to ground water, sanitary sewer, or combined sewer, and have no point source discharge to either surface water or a storm sewer system that drains to surface waters of the State.
 - b. Construction activities covered under an Erosivity Waiver (Special 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. (Note that “surface waters of the State” may exist on a construction site as well as off site; for example, a creek running through a site.)
2. Stormwater Associated with Construction Support Activity. This permit also authorizes stormwater discharge from support activities related to the permitted construction site (for example, an on-site portable rock crusher, off-site equipment staging yards, material storage areas, borrow areas, etc.) provided:
 - a. The support activity relates directly to the permitted construction site that is required to have a 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 authorized conditionally, 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.
 - d. Pipeline hydrostatic test water.
 - e. Uncontaminated air conditioning or compressor condensate.
 - f. Uncontaminated ground water or spring water.
 - g. Uncontaminated excavation dewatering water (in accordance with S9.D.10).
 - h. Uncontaminated discharges from foundation or footing drains.
 - i. Water used to control dust. Permittees must minimize the amount of dust control water used.
 - j. Routine external building wash down that does not use detergents.
 - k. Landscape irrigation water.

The SWPPP must adequately address all authorized non-stormwater discharges, except for discharges from fire-fighting activities, and must comply with Special

Condition S3. At a minimum, discharges from potable water (including water line flushing), fire hydrant system flushing, and pipeline hydrostatic test water must undergo the following: dechlorination to a concentration of 0.1 parts per million (ppm) or less, and pH adjustment to within 6.5 – 8.5 standard units (su), if necessary.

D. Prohibited Discharges:

The following discharges to waters of the State, including ground water, are prohibited.

1. Concrete wastewater.
2. Wastewater from washout and clean-up of stucco, paint, form release oils, curing compounds and other construction materials.
3. Process wastewater as defined by 40 Code of Federal Regulations (CFR) 122.1 (see Appendix A of this permit).
4. Slurry materials and waste from shaft drilling.
5. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.
6. Soaps or solvents used in vehicle and equipment washing.
7. Wheel wash wastewater, unless discharged according to Special Condition S9.D.9.d.
8. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed according to Special Condition S9.D.10.

E. Limits on Coverage

Ecology 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 CSWGP 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 completion of construction activities and the site has undergone final stabilization.
2. Non-point 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.
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. Stormwater from a site where an applicable Total Maximum Daily Load (TMDL) requirement specifically precludes or prohibits discharges from construction activity.

S2. APPLICATION REQUIREMENTS

A. Permit Application Forms

1. Notice of Intent Form/Timeline

- a. Operators of new or previously unpermitted construction activities must submit a complete and accurate permit application (Notice of Intent, or NOI) to Ecology.
- b. The operator must submit the NOI at least 60 days before discharging stormwater from construction activities and must submit it on or before the date of the first public notice (see Special Condition S2.B below for details). 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 Ecology specifies a later date in writing.
- c. Applicants who propose to discharge to a storm or sewer system operated by Seattle, King County, Snohomish County, Tacoma, Pierce County, or Clark County must also submit a copy of the NOI to the appropriate jurisdiction.
- d. If an applicant intends to use a Best Management Practice (BMP) selected on the basis of Special Condition S9.C.4 (~~“demonstrably equivalent”~~ BMPs), the applicant must notify Ecology of its selection as part of the NOI. In the event the applicant selects BMPs after submission of the NOI, it must provide notice of the selection of an equivalent BMP to Ecology at least 60 days before intended use of the equivalent BMP.
- e. Permittees must notify Ecology regarding any changes to the information provided on the NOI by submitting an updated NOI. Examples of such changes include, but are not limited to,
 - i. changes to the Permittee’s mailing address,
 - ii. changes to the on-site contact person information, and

iii. changes to the area/acreage affected by construction activity.

2. Transfer of Coverage Form

The Permittee can transfer current coverage under this permit to one or more new operators, including operators of sites within a Common Plan of Development, provided the Permittee submits a Transfer of Coverage Form in accordance with General Condition G9. Transfers do not require public notice.

B. Public Notice

For new or previously unpermitted construction activities, the applicant must publish a public notice at least one time each week for two consecutive weeks, at least 7 days apart, in a newspaper with general circulation in the county where the construction is to take place. The notice must contain:

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 (for example, residential construction, commercial construction, etc.), and the number of acres to be disturbed.
5. The name of the receiving water(s) (that is, the surface water(s) to which the site will discharge), or, if the discharge is through a storm sewer system, the name of the operator of the system.
6. The statement: "Any persons desiring to present their views to the Washington State Department of Ecology regarding this application, or interested in Ecology's action on this application, may notify Ecology in writing no later than 30 days of the last date of publication of this notice. Ecology reviews public comments and considers whether discharges from this project would cause a measurable change in receiving water quality, and, if so, whether the project is necessary and in the overriding public interest according to Tier II antidegradation requirements under WAC 173-201A-320. 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

Construction site operators may qualify for an erosivity waiver from the CSWGP if the following conditions are met:

1. The site will result in the disturbance of fewer 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 either the Texas A&M University online rainfall erosivity calculator at: <http://ei.tamu.edu/> or EPA's calculator at <http://cfpub.epa.gov/npdes/stormwater/lew/lewcalculator.cfm>. The period of construction activity starts when the land is first disturbed and ends with final stabilization. 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.
 - ii. For sites east of the Cascades Crest, excluding the Central Basin: June 15 – October 15.
 - iii. For sites east of the Cascades Crest, within the Central Basin: no additional timeframe restrictions apply. The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches. For a map of the Central Basin (Region 2), refer to <http://www.ecy.wa.gov/pubs/ecy070202.pdf>.
3. Construction site operators must submit a complete Erosivity Waiver certification form at least one week before disturbing the land. Certification must include statements that the operator will:
 - a. Comply with applicable local stormwater requirements; and
 - b. Implement appropriate erosion and sediment control BMPs to prevent violations of water quality standards.
4. This waiver is not available for facilities declared significant contributors of pollutants as defined in Special Condition S1.B.1.b.
5. This waiver does not apply to construction activities which include non-stormwater discharges listed in Special Condition S1.C.3.
6. If construction activity extends beyond the certified waiver period for any reason, the operator must 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 Special Condition 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 Special Condition S2.A and B before the end of the certified waiver period.

S3. COMPLIANCE WITH STANDARDS

- A. Discharges must 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 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 must 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 BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.
- C. Ecology presumes that a Permittee complies with water quality standards 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 complies with the following conditions. The Permittee must fully:
 - 1. Comply with all permit conditions, including planning, sampling, monitoring, reporting, and recordkeeping conditions.
 - 2. Implement 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. (For purposes of this section, the stormwater manuals listed in Appendix 10 of the Phase I Municipal Stormwater Permit are approved by Ecology.)
- D. Where construction sites also discharge to ground water, the ground water discharges must also meet the terms and conditions of this CSWGP. Permittees who discharge to ground water through an injection well must also comply with any applicable requirements of the Underground Injection Control (UIC) regulations, Chapter 173-218 WAC.

S4. MONITORING REQUIREMENTS, BENCHMARKS AND REPORTING TRIGGERS

Table 3. Summary of Primary Monitoring Requirements

Size of Soil Disturbance ¹	Weekly Site Inspections	Weekly Sampling w/ Turbidity Meter	Weekly Sampling w/ Transparency Tube	Weekly pH Sampling ²	Requires CESCL Certification?
Sites that disturb less than 1 acre, but are part of a larger Common Plan of Development	Required	Not Required	Not Required	Not Required	No
Sites that disturb 1 acre or more, but fewer than 5 acres	Required	Sampling Required – either method ³		Required	Yes
Sites that disturb 5 acres or more	Required	Required	Not Required ⁴	Required	Yes

A. Site Log Book

The Permittee must 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

The Permittee's (operator's) site inspections must include all areas disturbed by construction activities, all BMPs, and all stormwater discharge points. (See Special Conditions S4.B.3 and B.4 below for detailed requirements of the Permittee's Certified Erosion and Sediment Control Lead [CESCL]).

¹ Soil disturbance is calculated by adding together all areas affected by construction activity. Construction activity means clearing, grading, excavation, and any other activity that disturbs the surface of the land, including ingress/egress from the site.

² If construction activity results in the disturbance of 1 acre or more, and involves significant concrete work (1,000 cubic yards of poured or recycled concrete over the life of a project) or the use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), and stormwater from the affected area drains to surface waters of the State or to a storm sewer stormwater collection system that drains to other surface waters of the State, the Permittee must conduct pH monitoring sampling in accordance with Special Condition S4.D.

³ Sites with one or more acres, but fewer than 5 acres of soil disturbance, must conduct turbidity or transparency sampling in accordance with Special Condition S4.C.

⁴ Sites equal to or greater than 5 acres of soil disturbance must conduct turbidity sampling using a turbidity meter in accordance with Special Condition S4.C.

Construction sites one acre or larger that discharge stormwater to surface waters of the State must have site inspections conducted by a certified CESCL. Sites less than one acre may have a person without CESCL certification conduct inspections; sampling is not required on sites that disturb less than an acre.

1. The Permittee must examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen. The Permittee must 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 must correct the problems identified by:

- a. Reviewing the SWPPP for compliance with Special Condition S9 and making appropriate revisions within 7 days of the inspection.
 - b. Immediately beginning the process of fully implementing and maintaining appropriate source control and/or treatment BMPs as soon as possible, addressing the problems no later than within 10 days of the inspection. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period.
 - c. Documenting BMP implementation and maintenance in the site log book.
2. The Permittee must inspect all areas disturbed by construction activities, all BMPs, and all stormwater discharge points at least once every calendar week and within 24 hours of any discharge from the site. (For purposes of this condition, individual discharge events that last more than one day do not require daily inspections. For example, if a stormwater pond discharges continuously over the course of a week, only one inspection is required that week.) The Permittee may reduce the inspection frequency for temporarily stabilized, inactive sites to once every calendar month.
 3. The Permittee must have staff knowledgeable in the principles and practices of erosion and sediment control. The CESCL (sites one acre or more) or inspector (sites less than one acre) must have the skills to assess the:
 - a. Site conditions and construction activities that could impact the quality of stormwater, and
 - b. Effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.
 4. The SWPPP must identify the CESCL or inspector, who must be present on site or on-call at all times. The CESCL must obtain this certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology (see BMP C160 in the manual referred to in Special Condition S9.C.1 and 2).

5. The Permittee must summarize the results of each inspection in an inspection report or checklist and enter the report/checklist into, or attach it to, the site log book. At a minimum, each inspection report or checklist must include:
 - a. Inspection date and time.
 - b. Weather information, the general conditions during inspection and the approximate amount of precipitation since the last inspection, and precipitation within the last 24 hours.
 - c. A summary or list of all implemented BMPs, including observations of all erosion/sediment control structures or practices.
 - d. A description of the locations:
 - i. Of BMPs inspected.
 - ii. Of BMPs that need maintenance and why.
 - iii. Of BMPs that failed to operate as designed or intended, and
 - iv. Where additional or different BMPs are needed, and why.
 - e. A description of stormwater discharged from the site. The Permittee must note the presence of suspended sediment, turbidity, discoloration, and 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 following the inspection.
 - h. A summary report and a schedule of implementation of the remedial actions that the Permittee plans to take if the site inspection indicates that the site is out of compliance. The remedial actions taken must meet the requirements of the SWPPP and the permit.
 - i. The name, title, and signature of the person conducting the site inspection, a phone number or other reliable method to reach this person, 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
 - a. If construction activity involves the disturbance of 5 acres or more, the Permittee must conduct turbidity sampling per Special Condition S4.C.
 - b. If construction activity involves 1 acre or more but fewer than 5 acres of soil disturbance, the Permittee must conduct either transparency sampling **or** turbidity sampling per Special Condition S4.C.

2. Sampling Frequency

- a. The Permittee must sample all discharge locations at least once every calendar week when stormwater (or authorized non-stormwater) discharges from the site or enters any on-site surface waters of the state (for example, a creek running through a site).
- b. Samples must be representative of the flow and characteristics of the discharge.
- c. Sampling is not required when there is no discharge during a calendar week.
- d. Sampling is not required outside of normal working hours or during unsafe conditions.
- e. If the Permittee is unable to sample during a monitoring period, the Permittee must include a brief explanation in the monthly Discharge Monitoring Report (DMR).
- f. Sampling is not required before construction activity begins.

3. Sampling Locations

- a. Sampling is required at all points where stormwater associated with construction activity (or authorized non-stormwater) is discharged off site, including where it enters any on-site surface waters of the state (for example, a creek running through a site).
- b. The Permittee may discontinue sampling at discharge points that drain areas of the project that are fully stabilized to prevent erosion.
- c. The Permittee must identify all sampling point(s) on the SWPPP site map and clearly mark these points in the field with a flag, tape, stake or other visible marker.
- d. Sampling is not required for discharge that is sent directly to sanitary or combined sewer systems.

4. Sampling and Analysis Methods

- a. The Permittee performs turbidity analysis with a calibrated turbidity meter (turbidimeter) either on site or at an accredited lab. The Permittee must record the results in the site log book in nephelometric turbidity units (NTU).
- b. The Permittee performs transparency analysis on site with a 1³/₄-inch-diameter, 60-centimeter (cm)-long transparency tube. The Permittee will record the results in the site log book in centimeters (cm). Transparency tubes are available from: <http://watermonitoringequip.com/pages/stream.html>.

Table 4. Monitoring and Reporting Requirements

Parameter	Unit	Analytical Method	Sampling Frequency	Benchmark Value	Phone Reporting Trigger Value
Turbidity	NTU	SM2130 or EPA 180.1	Weekly, if discharging	25 NTU	250 NTU
Transparency	cm	Manufacturer instructions, or Ecology guidance	Weekly, if discharging	33 cm	6 cm

5. Turbidity/Transparency Benchmark Values and Reporting Triggers

The benchmark value for turbidity is 25 NTU or less. The benchmark value for transparency is 33 centimeters (cm). Note: Benchmark values do not apply to discharges to segments of water bodies on Washington State's 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus; these discharges are subject to a numeric effluent limit for turbidity. Refer to Special Condition S8 for more information.

a. Turbidity 26 – 249 NTU, or Transparency 32 – 7 cm:

If the discharge turbidity is 26 to 249 NTU; or if discharge transparency is less than 33 cm, but equal to or greater than 6 cm, the Permittee must:

- i. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.
- ii. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.
- iii. Document BMP implementation and maintenance in the site log book.

b. Turbidity 250 NTU or greater, or Transparency 6 cm or less:

If a discharge point's turbidity is 250 NTU or greater, or if discharge transparency is less than or equal to 6 cm, the Permittee must complete the reporting and adaptive management process described below.

- i. Telephone the applicable Ecology Region's Environmental Report Tracking System (ERTS) number within 24 hours, in accordance with Special Condition S5.F.
 - Central Region (Okanogan, Chelan, Douglas, Kittitas, Yakima, Klickitat, Benton): (509) 575-2490

- Eastern Region (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400
- Northwest Region (Kitsap, Snohomish, Island, King, San Juan, Skagit, Whatcom): (425) 649-7000
- Southwest Region (Grays Harbor, Lewis, Mason, Thurston, Pierce, Clark, Cowlitz, Skamania, Wahkiakum, Clallam, Jefferson, Pacific): (360) 407-6300

These numbers are also listed at the following web site:

<http://www.ecy.wa.gov/programs/wq/stormwater/construction/permit.html>

- ii. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.
- iii. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.
- iv. Document BMP implementation and maintenance in the site log book.
- v. Continue to sample discharges daily until:
 - a) Turbidity is 25 NTU (or lower); or
 - b) Transparency is 33 cm (or greater); or
 - c) The Permittee has demonstrated compliance with the water quality limit 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.

D. pH Sampling Requirements -- Significant Concrete Work or Engineered Soils

If construction activity results in the disturbance of 1 acre or more, **and** involves significant concrete work (significant concrete work means greater than 1000 cubic yards poured concrete or recycled concrete used over the life of a project) or the use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), 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 must conduct pH monitoring as set forth below. Note: In addition, discharges to segments of water bodies on Washington State's 303(d) list (Category 5) for high pH are subject to a numeric effluent limit for pH; refer to Special Condition S8.

1. For sites with significant concrete work, the Permittee must begin the pH monitoring period when the concrete is first poured and exposed to precipitation, and continue weekly throughout and after the concrete pour and curing period, until stormwater pH is in the range of 6.5 to 8.5 (su).
2. For sites with engineered soils, the Permittee must begin the pH monitoring period when the soil amendments are first exposed to precipitation and must continue until the area of engineered soils is fully stabilized.
3. During the applicable pH monitoring period defined above, the Permittee must obtain a representative sample of stormwater and conduct pH analysis at least once per week.
4. The Permittee must 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 before the stormwater discharges to surface waters.
5. The benchmark value for pH is 8.5 standard units. Anytime sampling indicates that pH is 8.5 or greater, the Permittee must either:
 - a. Prevent the high pH water (8.5 or above) from entering storm sewer systems or surface waters; or
 - b. If necessary, adjust or neutralize the high pH water until it is in the range of pH 6.5 to 8.5 (su) using an appropriate treatment BMP such as carbon dioxide (CO₂) sparging or dry ice. The Permittee must obtain written approval from Ecology before using any form of chemical treatment other than CO₂ sparging or dry ice.
6. The Permittee must 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.

S5. REPORTING AND RECORDKEEPING REQUIREMENTS

A. High Turbidity Phone Reporting

Anytime sampling performed in accordance with Special Condition S4.C indicates turbidity has reached the 250 NTU phone reporting level, the Permittee must call Ecology's Regional office by phone within 24 hours of analysis. The web site is <http://www.ecy.wa.gov/programs/wq/stormwater/construction/permit.html>. Also see phone numbers in Special Condition S4.C.5.b.i.

B. Discharge Monitoring Reports

Permittees required to conduct water quality sampling in accordance with Special Conditions S4.C (Turbidity/Transparency), S4.D (pH), S8 (303[d]/TMDL sampling), and/or G13 (Additional Sampling) must submit the results to Ecology.

Permittees must submit monitoring data using Ecology's WebDMR program. To find out more information and to sign up for WebDMR go to:

<http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html>.

Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper copy DMR at:

Mailing Address:

Department of Ecology

Water Quality Program

Attn: Stormwater Compliance Specialist

PO Box 47696

Olympia, WA 98504-7696

Permittees who obtain a waiver not to use WebDMR must use the forms provided to them by Ecology; submittals must be mailed to the address above. Permittees shall submit DMR forms to be received by Ecology within 15 days following the end of each month.

If there was no discharge during a given monitoring period, all Permittees must submit a DMR as required with ~~no~~ "no discharge" entered in place of the monitoring results. For more information, contact Ecology staff using information provided at the following web site: <http://www.ecy.wa.gov/programs/spills/response/assistancesoil%20map.pdf>

C. Records Retention

The Permittee must 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 for the entire life of the construction project and for a minimum of three years following the termination of permit coverage. Such information must include all calibration and maintenance records, and records of all data used to complete the application for this

permit. This period of retention must be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

D. Recording Results

For each measurement or sample taken, the Permittee must record the following information:

1. Date, place, method, and time of sampling or measurement.
2. The first and last name of the individual who performed the sampling or measurement.
3. The date(s) the analyses were performed.
4. The first and last name of the individual who performed the analyses.
5. The analytical techniques or methods used.
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 Special Condition S4 of this permit, the results of this monitoring must 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 part of the terms and conditions of this permit, and the resulting noncompliance may cause a threat to human health or the environment, the Permittee must:

1. Immediately notify Ecology of the failure to comply by calling the applicable Regional office ERTS phone number (find at <http://www.ecy.wa.gov/programs/spills/response/assistancesoil%20map.pdf>) or refer to Special Condition S4.C.5.b.i.
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 of becoming aware of the violation.
3. Submit a detailed written report to Ecology within five (5) days, unless requested earlier by Ecology. The report must 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.

The Permittee must report any unanticipated bypass and/or upset that exceeds any effluent limit in the permit in accordance with the 24-hour reporting requirement contained in 40 C.F.R. 122.41(l)(6)).

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. Refer to Section G14 of this permit for specific information regarding non-compliance.

G. Access to Plans and Records

1. The Permittee must retain the following permit documentation (plans and records) on site, or within reasonable access to the site, for use by the operator or for on-site review by Ecology or the local jurisdiction:
 - a. General Permit.
 - b. Permit Coverage Letter.
 - c. Stormwater Pollution Prevention Plan (SWPPP).
 - d. Site Log Book.
2. The Permittee must address written requests for plans and records listed above (Special Condition S5.G.1) as follows:
 - a. The Permittee must provide a copy of plans and records to Ecology within 14 days of receipt of a written request from Ecology.
 - b. The Permittee must provide a copy of plans and records to the public when requested in writing. Upon receiving a written request from the public for the Permittee's plans and records, the Permittee must either:
 - i. Provide a copy of the plans and records to the requester within 14 days of a receipt of the written request; or
 - ii. Notify the requester 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

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 requester at an Ecology office, or a mutually agreed 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 must notify the requester within 10 days of receipt of the request where the plans and records may be viewed and/or copied.

S6. PERMIT FEES

The Permittee must pay permit fees assessed by Ecology. Fees for stormwater discharges covered under this permit are established by Chapter 173-224 WAC. Ecology continues to assess permit fees 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

The Permittee must handle and dispose of 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, in accordance with:

- A. Special Condition S3, Compliance with Standards.
- B. WAC 173-216-110.
- C. Other applicable regulations.

S8. DISCHARGES TO 303(D) OR TMDL WATER BODIES

A. Sampling and Numeric Effluent Limits For Certain Discharges to 303(d)-listed Water Bodies

- 1. Permittees who discharge to segments of 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, must conduct water quality sampling according to the requirements of this section, and Special Conditions S4.C.2.b-f and S4.C.3.b-d, and must comply with the applicable numeric effluent limitations in S8.C and S8.D.
- 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 (Category 5) that exists on January 1, 2011, or the date when the operator's complete permit application is received by Ecology, whichever is later.

B. Limits on Coverage for New Discharges to TMDL or 303(d)-listed Waters

Operators of construction sites that discharge to a 303(d)-listed water body are not eligible for coverage under this permit *unless* the operator:

- 1. Prevents exposing stormwater to pollutants for which the water body is impaired, and retains documentation in the SWPPP that details procedures taken to prevent exposure on site; or
- 2. Documents that the pollutants for which the water body is impaired are not present at the site, and retains documentation of this finding within the SWPPP; or

3. Provides Ecology with data indicating the discharge is not expected to cause or contribute to an exceedance of a water quality standard, and retains such data on site with the SWPPP. The operator must provide data and other technical information to Ecology that sufficiently demonstrate:
 - a. For discharges to waters without an EPA-approved or -established TMDL, that the discharge of the pollutant for which the water is impaired will meet in-stream water quality criteria at the point of discharge to the water body; or
 - b. For discharges to waters with an EPA-approved or -established TMDL, that there is sufficient remaining wasteload allocation in the TMDL to allow construction stormwater discharge and that existing dischargers to the water body are subject to compliance schedules designed to bring the water body into attainment with water quality standards.

Operators of construction sites are eligible for coverage under this permit if Ecology issues permit coverage based upon an affirmative determination that the discharge will not cause or contribute to the existing impairment.

C. Sampling and Numeric Effluent Limits for Discharges to Water Bodies on the 303(d) List for Turbidity, Fine Sediment, or Phosphorus

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus must conduct turbidity sampling in accordance with Special Condition S4.C.2 and comply with either of the numeric effluent limits noted in Table 5 below.
2. As an alternative to the 25 NTU effluent limit noted in Table 5 below (applied at the point where stormwater [or authorized non-stormwater] is discharged off-site), permittees may choose to comply with the surface water quality standard for turbidity. The standard is: no more than 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or no more than a 10% increase in turbidity when the background turbidity is more than 50 NTU. In order to use the water quality standard requirement, the sampling must take place at the following locations:
 - a. Background turbidity in the 303(d)-listed receiving water immediately upstream (upgradient) or outside the area of influence of the discharge.
 - b. Turbidity at the point of discharge into the 303(d)-listed receiving water, inside the area of influence of the discharge.
3. Discharges that exceed the numeric effluent limit for turbidity constitute a violation of this permit.
4. Permittees whose discharges exceed the numeric effluent limit shall sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

Table 5. Turbidity, Fine Sediment & Phosphorus Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled	Unit	Analytical Method	Sampling Frequency	Numeric Effluent Limit ¹
• Turbidity • Fine Sediment • Phosphorus	Turbidity	NTU	SM2130 or EPA180.1	Weekly, if discharging	25 NTU, at the point where stormwater is discharged from the site; OR In compliance with the surface water quality standard for turbidity (S8.C.1.a)

¹Permittees subject to a numeric effluent limit for turbidity may, at their discretion, choose either numeric effluent limitation based on site-specific considerations including, but not limited to, safety, access and convenience.

D. Discharges to Water Bodies on the 303(d) List for High pH

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for high pH must conduct pH sampling in accordance with the table below, and comply with the numeric effluent limit of pH 6.5 to 8.5 su (Table 6).

Table 6. pH Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled/Units	Analytical Method	Sampling Frequency	Numeric Effluent Limit
High pH	pH /Standard Units	pH meter	Weekly, if discharging	In the range of 6.5 – 8.5

2. At the Permittee's discretion, compliance with the limit shall be assessed at one of the following locations:
 - a. Directly in the 303(d)-listed water body segment, inside the immediate area of influence of the discharge; or
 - b. Alternatively, the permittee may measure pH at the point where the discharge leaves the construction site, rather than in the receiving water.
3. Discharges that exceed the numeric effluent limit for pH (outside the range of 6.5 – 8.5 su) constitute a violation of this permit.
4. Permittees whose discharges exceed the numeric effluent limit shall sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

E. Sampling and Limits for Sites Discharging to Waters Covered by a TMDL or Another Pollution Control Plan

1. Discharges to a water body that is subject to a Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus must be consistent with the TMDL. Refer to <http://www.ecy.wa.gov/programs/wq/tmdl/index.html> for more information on TMDLs.
 - a. Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges must be consistent with any specific waste load allocations or requirements established by the applicable TMDL.
 - i. The Permittee must sample discharges weekly or as otherwise specified by the TMDL to evaluate compliance with the specific waste load allocations or requirements.
 - ii. Analytical methods used to meet the monitoring requirements must 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 has not identified specific requirements, compliance with Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance 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 Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance 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 that is completed and approved by EPA before January 1, 2011, or before 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

The Permittee must prepare and properly implement an adequate Stormwater Pollution Prevention Plan (SWPPP) for construction activity in accordance with the requirements of this permit beginning with initial soil disturbance and until final stabilization.

A. The Permittee's SWPPP must 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 must include a narrative and drawings. All BMPs must be clearly referenced in the narrative and marked on the drawings. The SWPPP narrative must include documentation to explain and justify the pollution prevention decisions made for the project. Documentation must 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 Special Condition 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—for example, a contingency plan for additional treatment and/or storage of stormwater that would violate the water quality standards if discharged.
 - f. Engineering calculations for ponds and any other designed structures.
2. The Permittee must 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 must then:
 - a. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the inspection or investigation.
 - b. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems no later than 10 days from the inspection or investigation. If

installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period,

- c. Document BMP implementation and maintenance in the site log book.

The Permittee must 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 must be consistent with:

1. Stormwater Management Manual for Western Washington (most recent edition), for sites west of the crest of the Cascade Mountains; or
2. Stormwater Management Manual for Eastern Washington (most recent edition), for sites east of the crest of the Cascade Mountains; or
3. Revisions to the manuals listed in Special Condition S9.C.1. & 2., or other stormwater management guidance documents or manuals which provide an equivalent level of pollution prevention, that are approved by Ecology and incorporated into this permit in accordance with the permit modification requirements of WAC 173-226-230; or
4. Documentation in the SWPPP that the BMPs selected provide 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) that support the performance claims for the BMPs being selected.
 - 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 must include each of the 12 elements below in Special Condition S9.D.1-12 in the narrative of the SWPPP and implement them 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. Before 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. Retain the duff layer, native top soil, and natural vegetation in an undisturbed state to the maximum degree practicable.
- 2. Establish Construction Access
 - a. Limit construction vehicle access and exit to one route, if possible.
 - b. Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs, to minimize tracking sediment onto roads.
 - c. Locate wheel wash or tire baths on site, if the stabilized construction entrance is not effective in preventing tracking sediment onto roads.
 - d. If sediment is tracked off site, clean the affected roadway thoroughly at the end of each day, or more frequently as necessary (for example, during wet weather). Remove sediment from roads by shoveling, sweeping, or pickup and transport of the sediment to a controlled sediment disposal area.
 - e. Conduct street washing only after sediment removal in accordance with Special Condition S9.D.2.d. Control street wash wastewater by pumping back on site or otherwise preventing it from discharging into systems tributary to waters of the State.
- 3. Control Flow Rates
 - a. Protect properties and waterways downstream of development sites from erosion and the associated discharge of turbid waters 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 Special Condition S9.D.3.a, construct stormwater retention or detention facilities as one of the first steps in grading. Assure that detention facilities function properly before constructing site improvements (for example, impervious surfaces).
 - c. If permanent infiltration ponds are used for flow control during construction, protect these facilities from siltation during the construction phase.

4. Install Sediment Controls

The Permittee must design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, the Permittee must design, install and maintain such controls to:

- a. Construct sediment control BMPs (sediment ponds, traps, filters, etc.) as one of the first steps in grading. These BMPs must be functional before other land disturbing activities take place.
- b. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of

resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.

- c. Direct stormwater runoff from disturbed areas through a sediment pond or other appropriate sediment removal BMP, before the runoff leaves a construction site or before discharge to an infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must meet the flow control performance standard of Special Condition S9.D.3.a.
- d. Locate BMPs intended to trap sediment on site in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.
- e. Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible.
- f. Where feasible, design outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column.

5. Stabilize Soils

- a. The Permittee must stabilize exposed and unworked soils 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. The Permittee must control stormwater volume and velocity within the site to minimize soil erosion.
- c. The Permittee must control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion.
- d. Depending on the geographic location of the project, the Permittee must not allow soils to 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.

- e. The Permittee must stabilize soils at the end of the shift before a holiday or weekend if needed based on the weather forecast.
- f. The Permittee must stabilize soil stockpiles from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.
- g. The Permittee must minimize the amount of soil exposed during construction activity.
- h. The Permittee must minimize the disturbance of steep slopes.
- i. The Permittee must minimize soil compaction and, unless infeasible, preserve topsoil.

6. Protect Slopes

- a. The Permittee must design and construct cut-and-fill slopes in a manner to 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 (for example, track walking).
- b. The Permittee must divert off-site stormwater (run-on) or ground water 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 must 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 must 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 must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model (WWHM) to predict flows, bare soil areas should be modeled as "landscaped area."

- ii. East of the Cascade Mountains Crest: Temporary pipe slope drains must 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. Place excavated material on the uphill side of trenches, consistent with safety and space considerations.
 - e. Place check dams at regular intervals within constructed channels that are cut down a slope.
7. Protect Drain Inlets
- a. Protect all storm drain inlets made operable during construction so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.
 - b. Clean or remove and replace inlet protection devices 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. Design, construct and stabilize all on-site conveyance channels to prevent erosion from the following expected peak flows:
 - i. West of the Cascade Mountains Crest: Channels must 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 must 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 must 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 must 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. Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches at the outlets of all conveyance systems.
9. Control Pollutants
- Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants. The Permittee must:

- a. Handle and dispose of all pollutants, including waste materials and demolition debris that occur on site in a manner that does not cause contamination of stormwater.
 - b. Provide cover, containment, and protection from vandalism 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 must include secondary containment. Secondary containment means placing tanks or containers within an impervious structure capable of containing 110% of the volume contained in the largest tank within the containment structure. Double-walled tanks do not require additional secondary containment.
 - c. Conduct maintenance, fueling, and repair of heavy equipment and vehicles using spill prevention and control measures. Clean contaminated surfaces immediately following any spill incident.
 - d. Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland land application, or to the sanitary sewer with local sewer district approval.
 - e. Apply fertilizers and pesticides in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Follow manufacturers' label requirements for application rates and procedures.
 - f. Use BMPs to prevent contamination of stormwater runoff by pH-modifying sources. The sources for this contamination 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. (Also refer to the definition for "concrete wastewater" in Appendix A--Definitions.)
 - g. Adjust the pH of stormwater if necessary to prevent violations of water quality standards.
 - h. Assure that washout of concrete trucks is performed offsite or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Do not dump excess concrete on site, except in designated concrete washout areas. Concrete spillage or concrete discharge to surface waters of the State is prohibited.
 - i. Obtain written approval from Ecology before using chemical treatment other than CO₂ or dry ice to adjust pH.
10. Control Dewatering
- a. Permittees must discharge foundation, vault, and trench dewatering water, which have characteristics similar to stormwater runoff at the site, into a

controlled conveyance system before discharge to a sediment trap or sediment pond.

- b. Permittees may discharge clean, non-turbid dewatering water, such as well-point ground water, to systems tributary to, or directly into surface waters of the State, as specified in Special Condition S9.D.8, provided the dewatering flow does not cause erosion or flooding of receiving waters. Do not route clean dewatering water through stormwater sediment ponds. Note that ~~surface~~ "surface waters of the State" may exist on a construction site as well as off site; for example, a creek running through a site.
- c. Other treatment or disposal options may include:
 - i. Infiltration.
 - ii. Transport off site 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 or combined sewer discharge with local sewer district approval, if there is no other option.
 - v. Use of a sedimentation bag with discharge to a ditch or swale for small volumes of localized dewatering.
- d. Permittees must handle highly turbid or contaminated dewatering water separately from stormwater.

11. Maintain BMPs

- a. Permittees must maintain and repair all temporary and permanent erosion and sediment control BMPs as needed to assure continued performance of their intended function in accordance with BMP specifications.
- b. Permittees must remove all temporary erosion and sediment control BMPs within 30 days after achieving final site stabilization or after the temporary BMPs are no longer needed.

12. Manage the Project

- a. Phase development projects to the maximum degree practicable and take into account seasonal work limitations.
- b. Inspection and monitoring -- Inspect, maintain and repair all BMPs as needed to assure continued performance of their intended function. Conduct site inspections and monitoring in accordance with Special Condition S4.
- c. Maintaining an updated construction SWPPP -- Maintain, update, and implement the SWPPP in accordance with Special Conditions S3, S4 and S9.

E. SWPPP – Map Contents and Requirements

The Permittee's SWPPP must also include a vicinity map or general location map (for example, a 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 must also include a legible site map (or maps) showing the entire construction site. The following features must 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.
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 of coverage when it has met any of the following conditions:
1. The site has undergone final stabilization, the Permittee has removed all temporary BMPs (except biodegradable BMPs clearly manufactured with the intention for the material to be left in place and not interfere with maintenance or land use), and all stormwater discharges associated with construction activity have been eliminated; or
 2. All portions of the site that have not undergone final stabilization per Special Condition S10.A.1 have been sold and/or transferred (per General Condition G9), and the Permittee no longer has operational control of the construction activity; or

3. For residential construction only, the Permittee has completed temporary stabilization and the homeowners have taken possession of the residences.
- B. When the site is eligible for termination, the Permittee must 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

The termination is effective on the date Ecology receives the NOT form, unless Ecology notifies the Permittee within 30 days that termination request is denied because the Permittee has not met the eligibility requirements in Special Condition S10.A.

Permittees transferring the property to a new property owner or operator/permittee are required to complete and submit the Notice of Transfer form to Ecology, but are not required to submit a Notice of Termination form for this type of transaction.

GENERAL CONDITIONS

G1. DISCHARGE VIOLATIONS

All discharges and activities authorized by this general permit must 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 must constitute a violation of the terms and conditions of this permit.

G2. SIGNATORY REQUIREMENTS

- A. All permit applications must 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 must 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 must 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 must 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 must 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 are 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 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 that indicates cumulative effects on the environment from dischargers covered under this permit are unacceptable.

G5. REVOCATION OF COVERAGE UNDER THE PERMIT

Pursuant to 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 must 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 must be submitted at least sixty (60) days prior to any proposed changes. Filing a request 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 will 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 must 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 agreement (Transfer of Coverage Form) between the current discharger (Permittee) and new discharger, signed by both parties and 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 a portion of a permitted site, the current discharger must also submit an updated application form (NOI) to the Director indicating the remaining permitted acreage after the transfer.

G10. REMOVED SUBSTANCES

The Permittee must not re-suspend or reintroduce collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of stormwater to the final effluent stream for discharge to state waters.

G11. DUTY TO PROVIDE INFORMATION

The Permittee must submit to Ecology, within a reasonable time, all information that 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 must 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 must 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 Special 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 must 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 must 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 must, as soon as possible, give notice to Ecology of planned physical alterations, modifications or additions to the permitted construction activity. The Permittee should be aware that, depending on the nature and size of the changes to the original permit, a new public notice and other permit process requirements may be required. Changes in activities that require reporting to Ecology include those that 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.
- 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 must promptly submit such facts or information.

G22. REPORTING ANTICIPATED NON-COMPLIANCE

The Permittee must 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, must 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 must 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 will 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 will 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. Bypass Procedures

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.

- 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 must notify Ecology at least thirty (30) days before the planned date of bypass. The notice must 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.
 - 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 must be considered during preparation of the Stormwater Pollution Prevention Plan (SWPPP) and must 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 before 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 must 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 was completed and approved by EPA before January 1, 2011, or before 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 Day A period of 24 consecutive hours starting at 12:00 midnight and ending the following 12:00 midnight.

Calendar Week (same as Week) means a period of seven consecutive days starting at 12:01 a.m. (0:01 hours) 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 and/or by different contractors, 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; 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; and 4) linear projects such as roads, pipelines, or utilities. If the project is part of a common plan of development or sale, the disturbed area of the entire plan must be used in determining permit requirements.

Composite Sample means 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).

Concrete wastewater means any water used in the production, pouring and/or clean-up of concrete or concrete products, and any water used to cut, grind, wash, or otherwise modify concrete or concrete products. Examples include water used for or resulting from concrete truck/mixer/pumper/tool/chute rinsing or washing, concrete saw cutting and surfacing (sawing, coring, grinding, roughening, hydro-demolition, bridge and road surfacing). When stormwater comes in contact with concrete wastewater, the resulting water is considered concrete wastewater and must be managed to prevent discharge to waters of the state, including ground water.

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.

Contaminant means any hazardous substance that does not occur naturally or occurs at greater than natural background levels. See definition of "hazardous substance" and WAC 173-340-200.

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.
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.

Dewatering 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.

Ecology means the Washington State Department of Ecology.

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.

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 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.

Hazardous Substance means any dangerous or extremely hazardous waste as defined in RCW 70.105.010 (5) and (6), or any dangerous or extremely dangerous waste as designated by rule under chapter 70.105 RCW; any hazardous sub-stance as defined in RCW 70.105.010(14) or any hazardous substance as defined by rule under chapter 70.105 RCW; any substance that, on the effective date of this section, is a hazardous substance under section 101(14) of the federal cleanup law, 42 U.S.C., Sec. 9601(14); petroleum or petroleum products; and any substance or category of substances, including solid waste decomposition products, determined by the director

by rule to present a threat to human health or the environment if released into the environment. The term hazardous substance does not include any of the following when contained in an underground storage tank from which there is not a release: crude oil or any fraction thereof or petroleum, if the tank is in compliance with all applicable federal, state, and local law.

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:

- The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
- The party has day-to-day operational control of those activities at a project that 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).

Permittee means individual or entity that receives notice of coverage under this general permit.

pH means a liquid's measure of 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 must be tested a minimum of once every seven days to determine if stormwater pH is between 6.5 and 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.

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product (40 CFR 122.1).

Receiving water means the water body at the point of discharge. If the discharge is to a storm sewer system, either surface or subsurface, the receiving water is the water body to which the storm system discharges. 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 water body, 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 over the life of a project.

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.

Temporary Stabilization means the exposed ground surface has been covered with appropriate materials to provide temporary stabilization of the surface from water or wind erosion. Materials include, but are not limited to, mulch, riprap, erosion control mats or blankets and temporary cover crops. Seeding alone is not considered stabilization. Temporary stabilization is not a substitute for the more permanent —ifial stabilization.”

Total Maximum Daily Load (TMDL) means a calculation of the maximum amount of a pollutant that a water body 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 must include a "margin of safety" to ensure that the water body can be protected in case there are unforeseen events or unknown sources of the pollutant. The calculation must 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 means the clarity of water expressed as nephelometric turbidity units (NTU) and measured with a calibrated turbidimeter.

Uncontaminated means free from any contaminant, as defined in MTCA cleanup regulations. See definition of —contaminant” and WAC 173-340-200.

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.

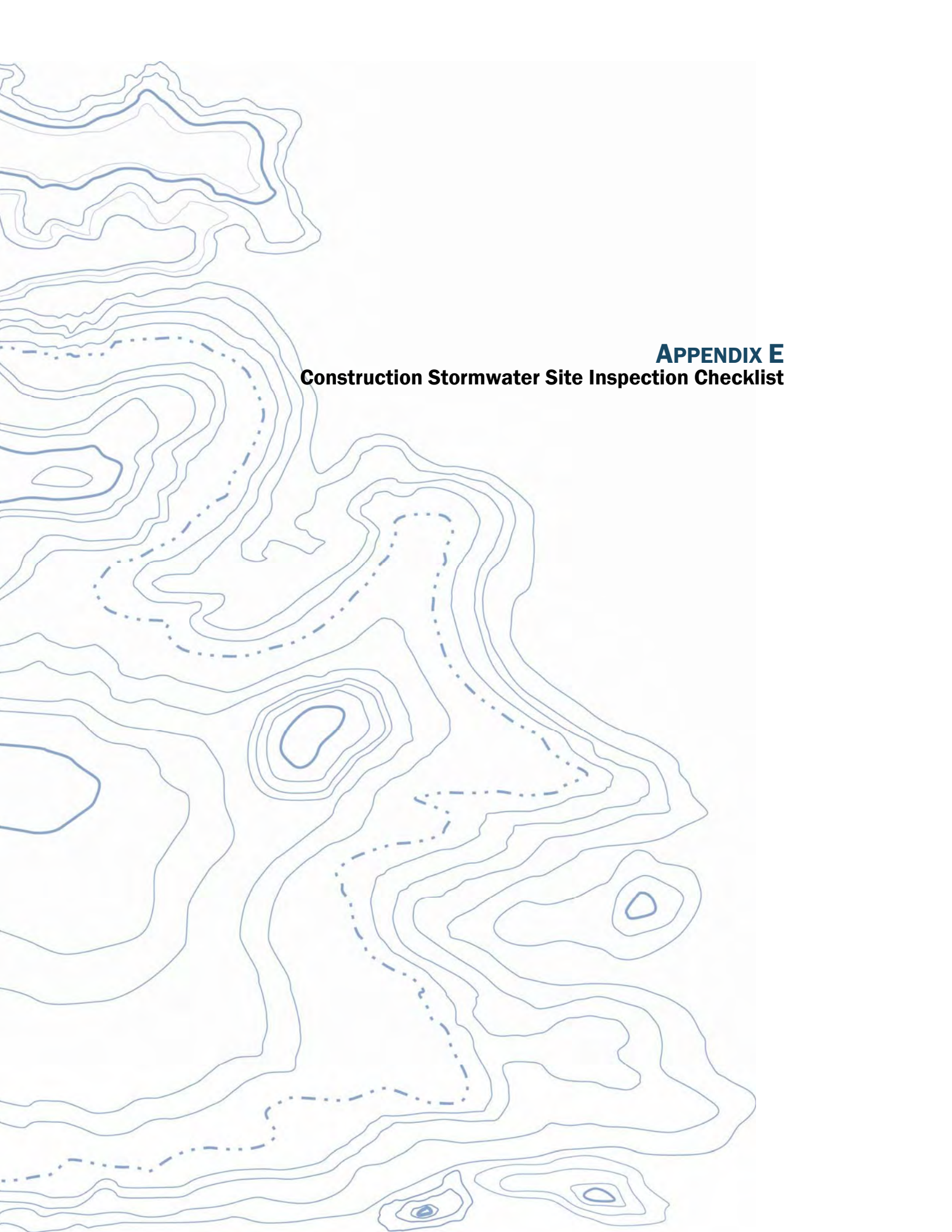
Waters of the State includes those waters as defined as "waters of the United States" in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and "waters of the State" as defined in Chapter 90.48 RCW, which include lakes, rivers, ponds, streams, inland waters, underground waters, 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.)

Wheel wash wastewater means any water used in, or resulting from the operation of, a tire bath or wheel wash (BMP C106: Wheel Wash), or other structure or practice that uses water to physically remove mud and debris from vehicles leaving a construction site and prevent track-out onto roads. When stormwater combines with wheel wash wastewater, the resulting water is considered wheel wash wastewater and must be managed according to Special Condition S9.D.9.

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
FR	Federal Register
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 E
Construction Stormwater Site Inspection Checklist

Construction Stormwater SITE INSPECTION CHECKLIST

Project _____ Permit No. _____ Inspector _____ Date _____ Time _____

Site BMPs	Overall Condition	Need Repair?	Comments/Observations
Clearing Limits • <i>Buffer Zones around sensitive areas</i> • •	G F P G F P G F P	Y N Y N Y N	
Construction Access/Roads • <i>Stabilized site entrance</i> • <i>Stabilized roads/parking area</i> •	G F P G F P G F P	Y N Y N Y N	
Control Flow Rates • <i>Swale</i> • <i>Dike</i> • <i>Sediment pond</i> • <i>Sediment trap</i> • •	G F P G F P G F P G F P G F P G F P	Y N Y N Y N Y N Y N Y N	
Install Sediment Controls • <i>Sediment pond/trap</i> • <i>Silt fence</i> • <i>Straw bale barriers</i> • • •	G F P G F P G F P G F P G F P G F P	Y N Y N Y N Y N Y N Y N	
Preserve Vegetation/Stabilize Soils • <i>Nets and blankets</i> • <i>Mulch</i> • <i>Seeding</i> • •	G F P G F P G F P G F P G F P	Y N Y N Y N Y N Y N	
Protect Slopes • <i>Terrace</i> • <i>Pipe slope drains</i> • •	G F P G F P G F P G F P	Y N Y N Y N Y N	
Protect Drain Inlets • <i>Inserts</i> • •	G F P G F P G F P	Y N Y N Y N	
Stabilize Channels and Outlets • <i>Conveyance channels</i> • <i>Energy dissipators</i> •	G F P G F P G F P	Y N Y N Y N	
Control Pollutants • <i>Chemical Storage Area covered</i> • <i>Concrete handling</i> •	G F P G F P G F P	Y N Y N Y N	
Control De-watering •	G F P	Y N	

G=Good F=Fair P=Poor Y=Yes N=No

**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) _____

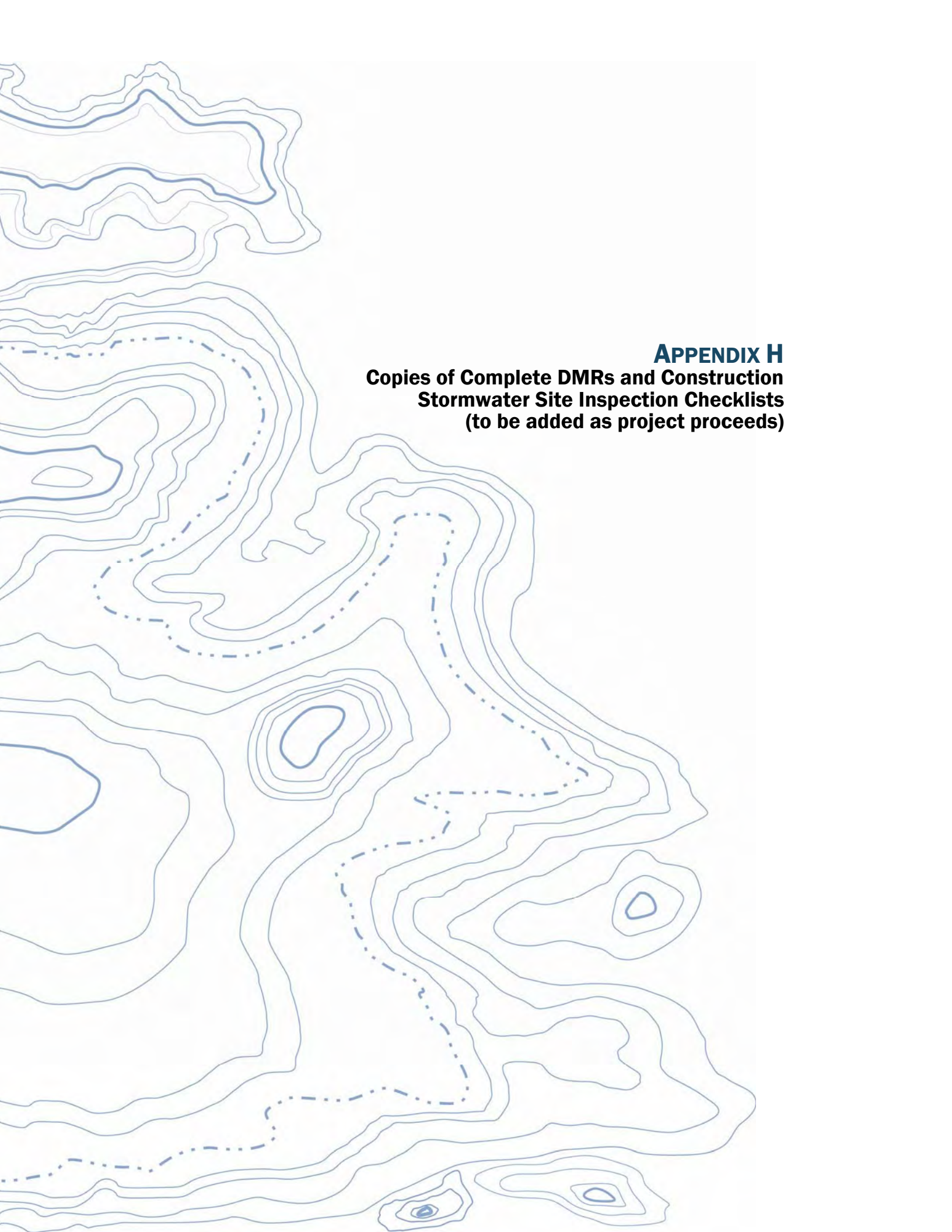
Title/Qualification of Inspector: _____



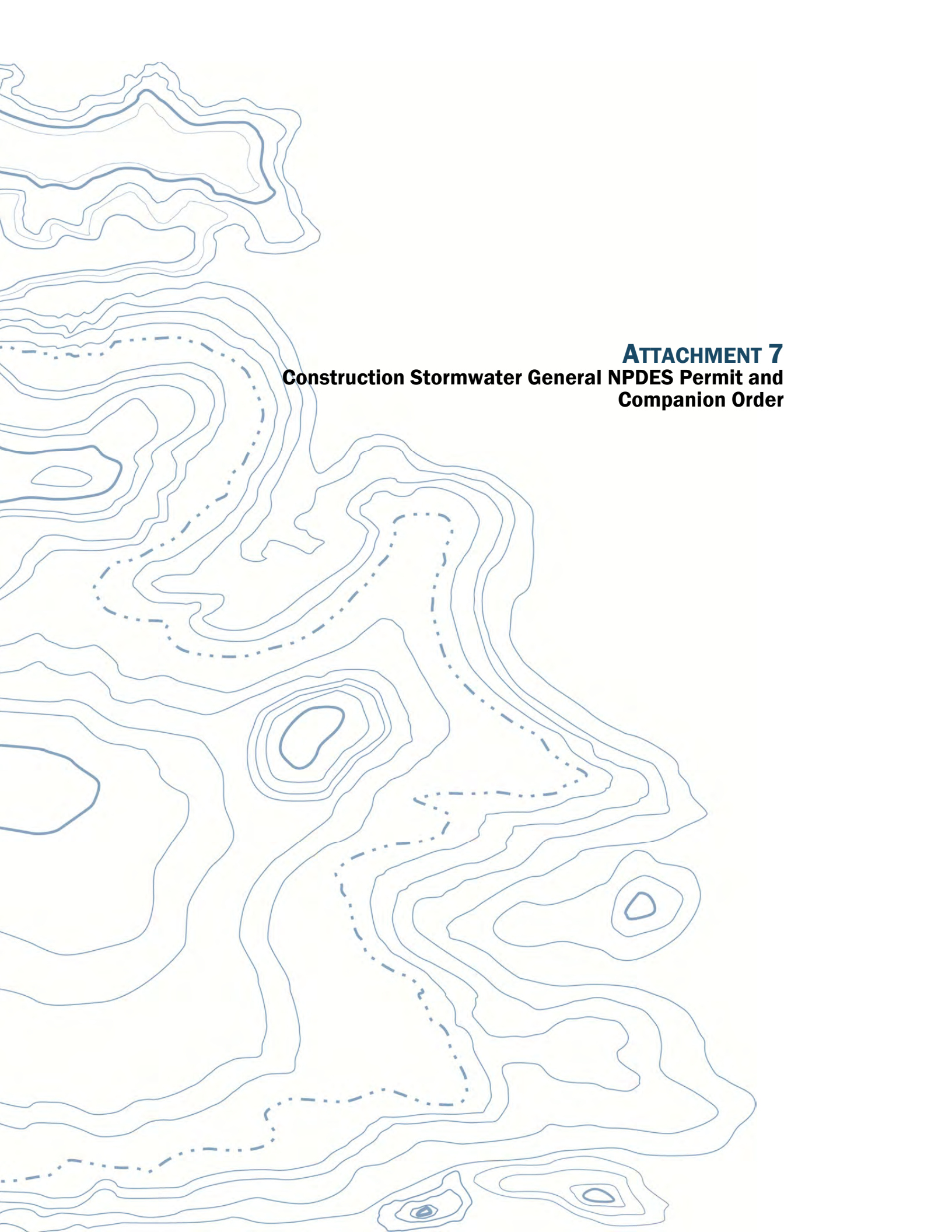
APPENDIX F
Discharge Monitoring Report Form
(to be added if permit holder requests paper
submittal)



APPENDIX G
Ecology Correspondence
(to be added as project proceeds)



APPENDIX H
Copies of Complete DMRs and Construction
Stormwater Site Inspection Checklists
(to be added as project proceeds)



ATTACHMENT 7
**Construction Stormwater General NPDES Permit and
Companion Order**

June 3, 2011

Sara Young
Port of Skagit County
PO Box 348
Burlington, WA 98233

RE: Coverage under the Construction Stormwater General Permit

Permit number:	WAR-124975
Site Name:	Taxiway F Site Skagit Regional Airport EAO 6158
Location:	3200 East of Farm-to-Market Rd
	Burlington Skagit
Disturbed Acres:	2.2

Dear Ms. Young:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Construction Stormwater General Permit (permit). This is your permit coverage letter. Your permit coverage is effective on June 3, 2011. **Please retain this permit coverage letter with your permit (enclosed), stormwater pollution prevention plan (SWPPP), and site log book. These materials are the official record of permit coverage for your site.**

Please take time to read the entire permit and contact Ecology if you have any questions.

Appeal Process

You have a right to appeal coverage under the general permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this letter. This appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

Sara Young
June 3, 2011
Page 2

To appeal, you must do the following within 30 days of the date of receipt of this letter:

- File your appeal and a copy of the permit cover page with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and the permit cover page on Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

Address and Location Information:

Street Addresses:

Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Pollution Control Hearings Board (PCHB)
1111 Israel Road SW, Suite 301
Tumwater, WA 98501

Mailing Addresses:

Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

Pollution Control Hearings Board
PO Box 40903
Olympia, WA 98504-0903

Electronic Discharge Monitoring Reports (WAWebDMR)

This permit requires that Permittees submit monthly discharge monitoring reports (DMRs) electronically using Ecology's secure online system, WAWebDMR. To sign up for WAWebDMR go to: www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html. If you have questions, contact Tonya Wolfe at (360) 407-7097 (locally), or (800) 633-6193/option 3, or email WAWebDMR@ecy.wa.gov.

Ecology Field Inspector Assistance

If you have questions regarding stormwater management at your construction site, please contact Kurt Baumgarten of Ecology's Bellingham Field Office at (360) 715-5210, or kurt.baumgarten@ecy.wa.gov.

Questions or Additional Information

Ecology is committed to providing assistance. Please review our web page at: www.ecy.wa.gov/programs/wq/stormwater/construction/. If you have questions about the construction stormwater general permit, please contact Shawn Hopkins at (360) 407-6442, or shawn.hopkins@ecy.wa.gov.

Sincerely,

Bill Moore, P.E.
Program Development Services, Section Manager
Water Quality Program
Enclosure



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Bellingham Field Office • 1440 10th Street, Suite 102 • Bellingham, Washington 98225
(360) 715-5200 • FAX (360) 715-5225

July 6, 2011

Sara Young
Port of Skagit County
PO Box 384
Burlington, WA 98233

Order Docket #	8564
Site Location	3200 feet east of Farm to Market Road and 600 feet south of Bayview Road on the western side of the Skagit Regional Airport

Re: Administrative Order

Dear Ms. Young:

The Department of Ecology (Ecology) has issued the enclosed Administrative Order (Order) requiring the Port of Skagit County to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) – State of Washington Water Pollution Control Act
- Chapter 173-201A-240 Washington Administrative Code (WAC) – Toxic Substances
- Permit: NPDES Construction Stormwater General Permit WAR124975

If you have questions please contact Kurt Baumgarten at 360.715.5210 or kuba461ecy.wa.gov

Sincerely,

A handwritten signature of Richard M. Grout, Manager, in black ink.

Richard M. Grout, Manager
Bellingham Field Office

Enclosures: Administrative Order Docket #8564

By certified mail 7010 2780 0000 6712 9231
cc: GeoEngineers

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF AN) ADMINISTRATIVE ORDER
ADMINISTRATIVE ORDER) DOCKET #8564
AGAINST)
Port of Skagit County)
Sara Young)

To: Sara Young
Port of Skagit
PO Box 384
Burlington, WA 98233

Order Docket #	8564
Site Location	3200 feet east of Farm to Market Road and 600 feet south of Bayview Road on the western side of the Skagit Regional Airport

The Department of Ecology (Ecology) has issued this Administrative Order (Order) requiring the Port of Skagit to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) – State of Washington Water Pollution Control Act
- Chapter 173-201A-240 Washington Administrative Code (WAC) – Toxic Substances
- Permit: NPDES Construction Stormwater General Permit WAR124975

Condition G13 of the NPDES Construction Stormwater General Permit gives Ecology the authority to issue Administrative Orders requiring additional monitoring. Additionally, 90.48.120(2) RCW authorizes the Department to issue Administrative Orders to accomplish the purposes of Chapter 90.48 RCW.

ORDER TO COMPLY

The Port of Skagit has received coverage under NPDES Construction Stormwater General Permit WAR124975 for construction activities associated with the cleanup site known as *Taxiway F Site, Skagit Regional Airport* being carried out pursuant to a Model Toxics Control Act (MTCA) consent decree between the Port and Ecology (Agreed Order 6518). The contaminant being cleaned up is Endosulfan. The Construction Stormwater General Permit does not have water quality sampling or benchmarks for Endosulfan, however, it requires compliance with the Water Quality Standards for Surface Waters of the State of Washington (Water Quality Standards).

The Water Quality Standards set the acute freshwater criteria for Endosulfan not to exceed an instantaneous concentration of **0.22 µg/l (ppb)**. An exceedence of this criteria would constitute a water quality standards violation (General Permit Condition S3).

For these reasons and in accordance with RCW 90.48.120(2) it is ordered that the Port of Skagit take the following actions. These actions are required at the location known as *Taxiway F Site, Skagit Regional Airport*, located 3200 feet east of Farm to Market Road and 600 feet south of Bayview Road on the western side of the Skagit Regional Airport

The following actions must be taken to remain in compliance with NPDES Permit WAR124975:

- All stormwater from the clean up area shall be prevented from discharging to waters of the state prior to being sampled.
- Stormwater shall be captured and contained in storage tanks.
- Each tank shall be sampled and analyzed separately prior to discharge in batches.
- A grab sample of each batch shall be analyzed to ensure any discharge does not exceed the acute freshwater criteria for Endosulfan of **0.22 µg/l (ppb)**, using EPA Method 8081A-GC/ECD.
- Sampling for Endosulfan shall be reported on the required Discharge Monitoring Report (DMR) according to Permit conditions.
- Any discharge to waters of the state in exceedence of the Endosulfan criteria shall be reported according to Permit Condition S5.F, Noncompliance Notification.
- The SWPPP prepared by GeoEngineers dated June 20, 2011 shall be fully implemented and amended as needed for the duration of the project.

All monitoring data shall be prepared by a laboratory registered or accredited under the provisions of, *Accreditation of Environmental Laboratories*, Chapter 173-50 WAC

FAILURE TO COMPLY WITH THIS ORDER

Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

YOUR RIGHT TO APPEAL

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Your appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel Road SW STE 301 Tumwater, WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

CONTACT INFORMATION

Please direct all questions about this Order to:

Kurt Baumgarten
Department of Ecology
Bellingham Filed Office
1440 10th St Bellingham, WA 98225
Phone: 360.715.5210
Email: kuba461@ecy.wa.gov

MORE INFORMATION

- Pollution Control Hearings Board Website
www.eho.wa.gov/Boards_PCHB.aspx

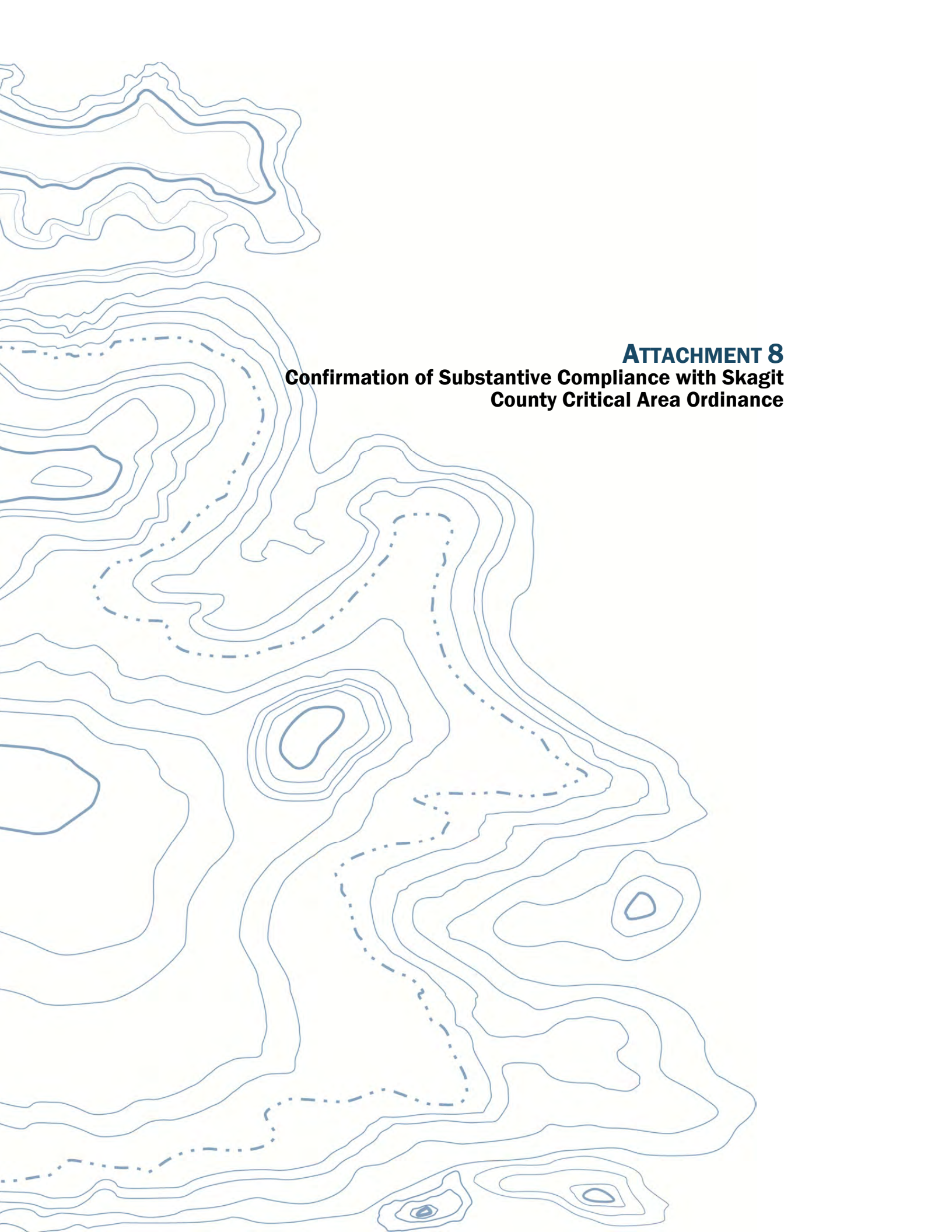
- Chapter 43.21B RCW - Environmental Hearings Office – Pollution Control Hearings Board
<http://apps.leg.wa.gov/RCW/default.aspx?cite=43.21B>
- **Chapter 371-08 WAC – Practice And Procedure**
<http://apps.leg.wa.gov/WAC/default.aspx?cite=371-08>
- **Chapter 34.05 RCW – Administrative Procedure Act**
<http://apps.leg.wa.gov/RCW/default.aspx?cite=34.05>
- **Laws:** www.ecy.wa.gov/laws-rules/ecyrcw.html
- **Rules:** www.ecy.wa.gov/laws-rules/ecywac.html

SIGNATURE



Richard M. Grout, Manager
Bellingham Field Office

7/6/11
Date



ATTACHMENT 8
Confirmation of Substantive Compliance with Skagit
County Critical Area Ordinance



PLANNING & DEVELOPMENT SERVICES

GARY R. CHRISTENSEN, AICP, DIRECTOR

BILL DOWE, DEPUTY DIRECTOR

PATTI CHAMBERS
Administrative Coordinator

TIM DEVRIES, CBO, ACO
Building Official & Floodplain Manager

April 5, 2011

Port of Skagit County
Attn: Sara Young
PO Box 348
Burlington, WA 98233

Re: Critical areas review of contaminated soils cleanup on parcels P21099 & P21102, file #PL11-0091

Dear Ms. Young,

We have completed review of the submitted materials. Based on the information provided, your proposed cleanup of contaminated soils near Taxiway F is allowed without further critical areas review pursuant to SCC 14.24.040(3): Jurisdictional Substitution. The County has determined that the authorization you have received from the Army Corps of Engineers satisfies the requirements of the Critical Areas Ordinance.

Please note: This review is only to determine compliance with SCC 14.24. Approval of this proposal does not constitute approval under SCC 14.16, Skagit County Zoning, or any other applicable regulations.

If you have any questions, please feel free to contact our office.

Sincerely,

A handwritten signature in blue ink, appearing to read "Leah Forbes".

Leah Forbes, AICP
Senior Planner



Planning & Development Services
Critical Areas Checklist
Pursuant to Skagit County Code 14.24.080

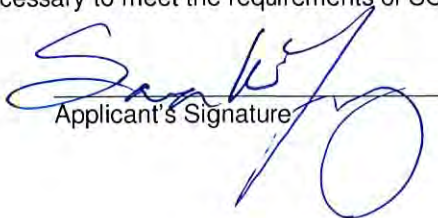
Section 4 Township 34 Range 3 Parcel Number 21099 & 21102 Related Permit: Critical Area Review
Site Address: Taxiway F - Skagit Regional Airport, Burlington, WA
Proposed uses: Contaminated Site Cleanup - Storage & Vehicle Parking

Please answer the following questions concerning Critical Area indicators located on or within 300 feet of the project area.

- a. Are you aware of any environmental documentation that has been prepared related to critical areas that includes the subject area? (*If yes, please attach a list of document titles).
☒ Yes* ☐ No ☐ Unknown
- b. Are there any surface waters (including year-round and seasonal streams, saltwater, lakes, ponds, bogs, fens, swamps, marshes)?
☐ Yes ☒ No ☐ Unknown
- c. Is there vegetation that is associated with wetlands?
☒ Yes ☐ No ☐ Unknown
- d. Have any wetlands been identified?
☒ Yes ☐ No ☐ Unknown
- e. Are there areas where the ground is consistently inundated or saturated with water?
☐ Yes ☒ No ☐ Unknown
- f. Are there any State or Federally listed sensitive, endangered or threatened species and habitats?
☐ Yes ☒ No ☐ Unknown
- g. Are there slopes of 15% or greater?
☐ Yes ☒ No ☐ Unknown
- h. Are there any landslide hazard areas?
☐ Yes ☒ No ☐ Unknown
- i. Is the project located within a Flood Hazard Zone?
☐ Yes ☒ No ☐ Unknown

I grant permission to the field inspector to enter the building site to determine the presence or absence of critical areas.

I understand that if the information on this form is later determined to be incorrect, the project or activity may be subject to conditions or denial as necessary to meet the requirements of SCC 14.24, the Skagit County Critical Areas Ordinance.


Applicant's Signature

3/3/11
Date



Skagit County Planning & Development Services

1800 Continental Place

Mount Vernon, WA 98273

Office: (360) 336-9410 Fax: (360) 336-9416

<http://www.skagitcounty.net>

Critical Area Review

Must Include:

Site Plan ☐ Assessor's Map ☒ CAO Checklist ☒ \$ 300 Review Fee ☒

*See Wetland Restoration Plan **Please invoice Port of Skagit County

Property Owner: Port of Skagit County

Applicant/Contact: Port of Skagit County, Sara Young

Mailing Address: PO Box 348

City: Burlington State: WA Zip: 98233

Phone: 360.757.0011 Fax: 360.757.0014

Site Address: 3200 east of Farm-to-Market Road and 600 feet south of Bayview Road on the western side of the Skagit Regional Airport.

Property ID # 21099 and 21102 Sec 4 Twp 34 Rng 3

Description of Proposal:

Soils at the site containing pesticide concentrations above the MTCA cleanup levels will be removed and clean imported fill (topsoil) will be placed to restore the site to grade. Some wetland areas will be temporarily impacted and restored according to the Updated Wetland Restoration Plan.

Directions to site:

From I-5 North, take Exit 230 and head West on Hwy 20 for five miles. Turn right onto Farm-to-Market Road and take it for 1.8 miles. Turn right onto Bayview Road and soon you will come to a locked gate. Once through the locked gate go to the end of Bayview Road and right right onto Taxiway F. The site will be on the left 600 feet south.

Are there any landmarks (realty signs, flagging, other) to help us locate the site? Are there any other structures on this property?

There is a large Hangar building at the site. It is the only structure on the east side of Taxiway F.



ATTACHMENT 9
Confirmation of Substantive Compliance with
Skagit County Grading Permit



SKAGIT COUNTY PUBLIC WORKS DEPARTMENT

1800 Continental Place, Mount Vernon, WA 98273-5625
(360) 336-9400 FAX (360) 336-9478

June 9, 2011

John Herzog, PhD
GeoEngineers

RE: Port of Skagit cleanup

John,

Skagit County Public Works has reviewed the proposed grading plan for the site cleanup of the old crop dusting hanger.

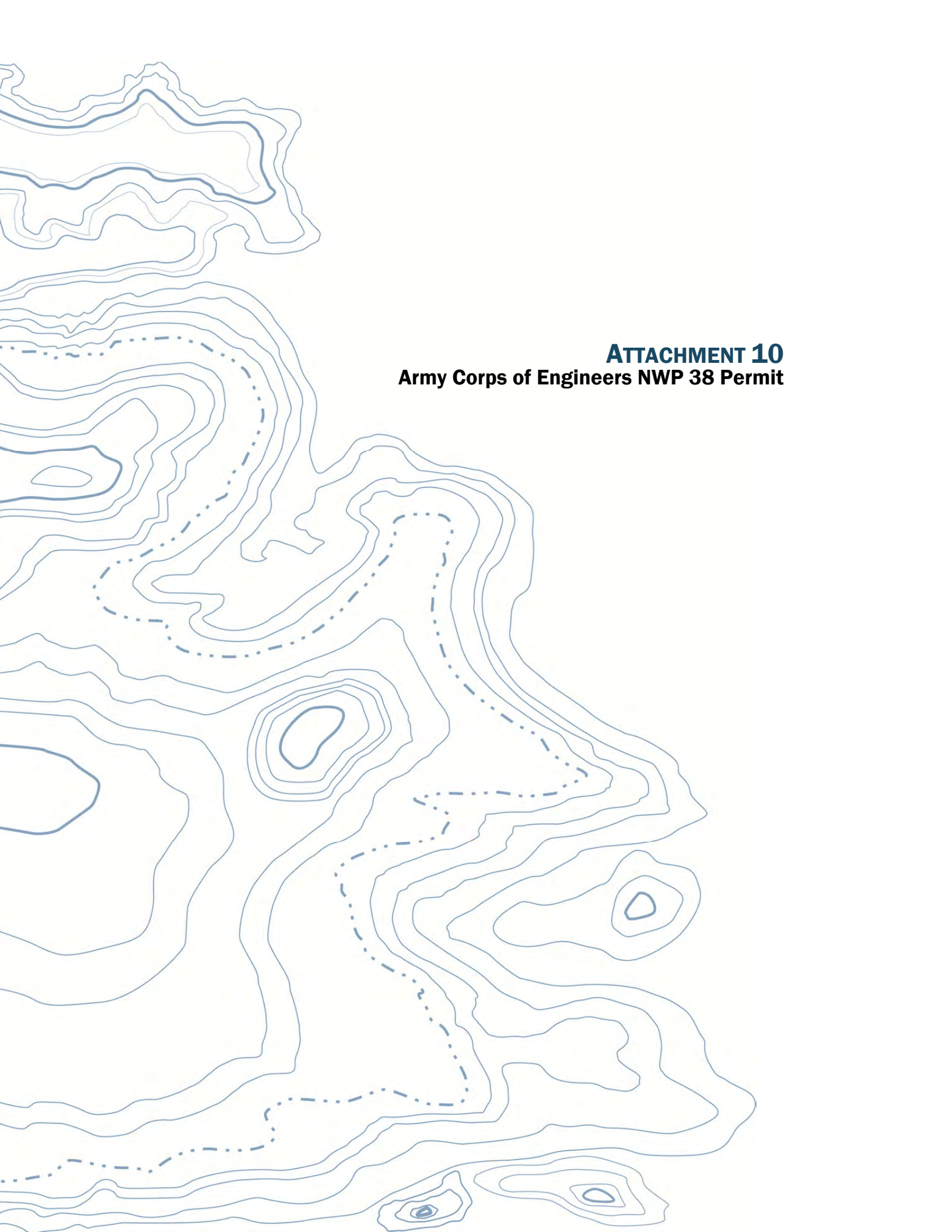
Plans and specs meet all applicable Skagit County requirements.

Should you have any questions regarding this matter please do not hesitate to contact me at 360-336-9400.

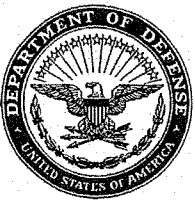
Sincerely,

A handwritten signature in blue ink, appearing to read "Shane Whitney", is written over a horizontal line.

Shane Whitney
Engineering Technician



ATTACHMENT 10
Army Corps of Engineers NWP 38 Permit



DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

REPLY TO
ATTENTION OF

JUL 17 2008

Regulatory Branch

Port of Skagit County
Ms. Sara Young
Post office Box 348
Burlington, Washington 98233

Reference: NWS-2008-19-NO
Skagit County, Port of

Dear Ms. Young:

We have reviewed your application to excavate and place fill in wetlands near Burlington, Skagit County, Washington. Based on the information you provided to us, Nationwide Permit 38, *Cleanup of Hazardous and Toxic Waste* (Federal Register, March 12, 2007 Vol. 72, No. 47), authorizes your proposal to clean up contaminated sediments as depicted on the enclosed drawings dated June 2008. In order for this NWP authorization to be valid, you must ensure that the work is performed in accordance with the enclosed *Nationwide Permit 38, Terms and Conditions* and the following special conditions:

- a. The permittee must install and maintain sediment and erosion control during construction at the site and until the disturbed soil has been stabilized.
- b. The permittee must implement the provisions of the document titled, "*Wetland Restoration Plan, Port of Skagit County Farmer's Supply/Tronsdale Site, Skagit County, Washington*," dated June 24, 2008 and the addendum (planting plan) dated July 7, 2008 in their entirety.
- c. A status reports on the wetland and buffer remediation (restoration), including photos, must be submitted to the Corps, Seattle District, Regulatory Branch, 13 months from the date of permit issuance. All reports must be submitted to the Corps, Seattle District, Regulatory Branch and must prominently display the reference number NWS-2008-19-NO.

The authorized work complies with the Washington State Department of Ecology's (Ecology) Water Quality Certification and the Coastal Zone Management Act requirements for this NWP. No further coordination with Ecology is required for these requirements.

We have reviewed your project pursuant to the requirements of the Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act in regards to Essential Fish Habitat (EFH). We have determined that this project complies with the requirements of NWP National General Condition regarding ESA and will not adversely affect EFH.

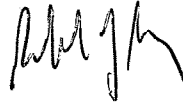
We have completed an approved jurisdictional determination for your project area which can be found on our website at <http://www.nws.usace.army.mil/> click on Regulatory, Regulatory/Permits, Recent Jurisdictional Determinations. If you object to this determination, you may request an administrative appeal under our regulations 33 CFR 331 as described in the enclosed *Appeal Process Fact Sheet* and the *Notification of Administrative Appeal Options and Process and Request for Appeal* form.

Our verification of this NWP authorization is valid for 2 years from the date of this letter unless the NWP is modified, reissued, or revoked prior to that date. If the authorized work has not been completed by that date, please contact us to discuss the status of your authorization. Failure to comply with all terms and conditions of this NWP verification invalidates this authorization and could result in a violation of Section 404 of the Clean Water Act and/or Section 10 of the 1899 Rivers and Harbors Act. Also, you must obtain all State and local permits that apply to this project.

Upon completing the authorized work, you must fill out and return the enclosed *Certificate of Compliance with Department of the Army Permit* form. Thank you for your cooperation during the permit process. We are interested in your experience with our Regulatory Program and encourage you to complete a customer service survey form. This form and information about our program is available on our website.

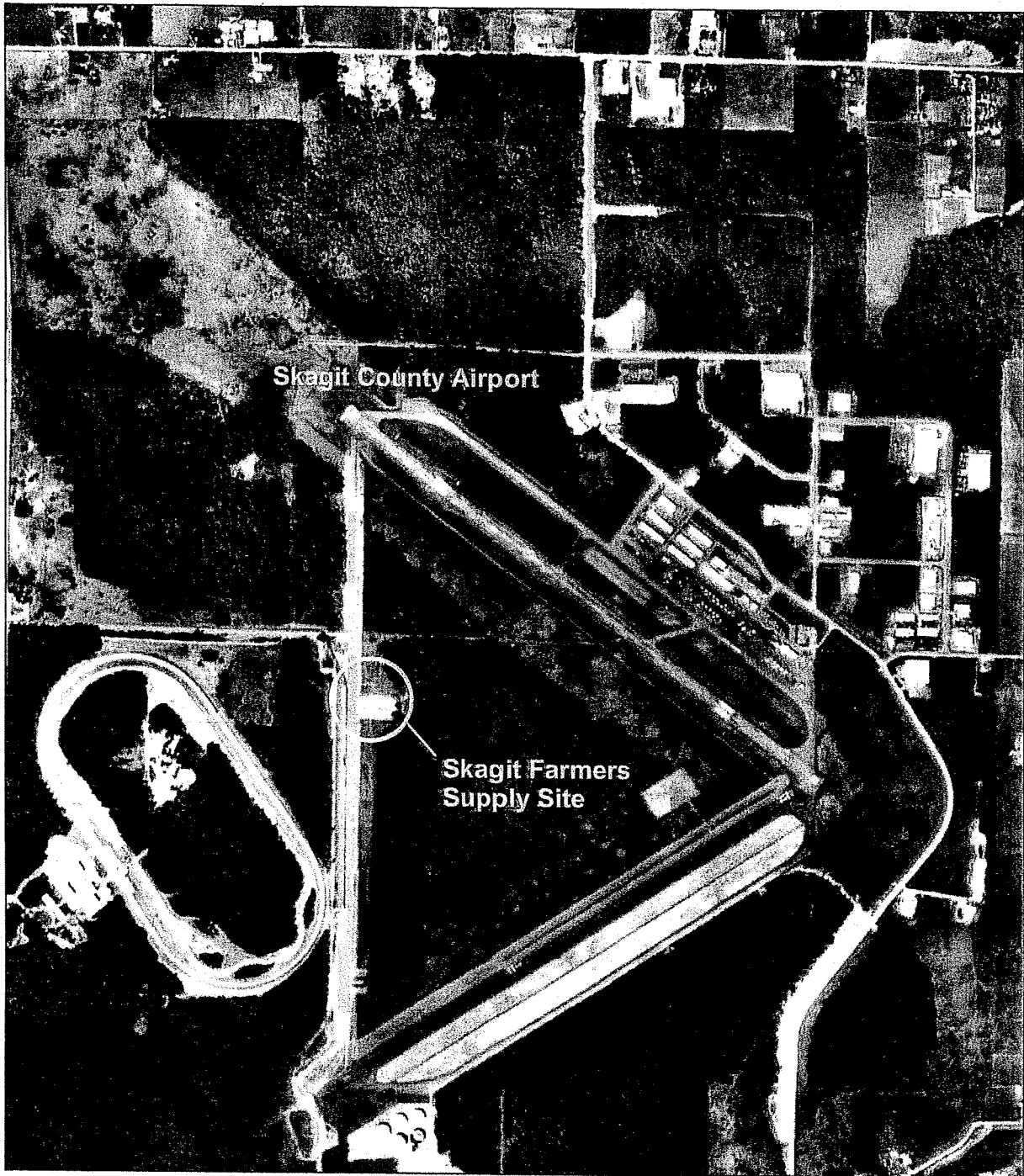
A copy of this letter with enclosure will be furnished to Celina Abercrombie of Hart Crowser, Inc. at 120 3rd Avenue South, Suite 110, Edmonds, Washington 98020. If you have any questions about this letter, please contact me at (206) 764-6985 or via email at randel.j.perry@usace.army.mil.

Sincerely,

A handwritten signature in black ink, appearing to read 'Randel Perry', with a stylized flourish at the end.

Randel Perry, Project Manager
Regulatory Branch

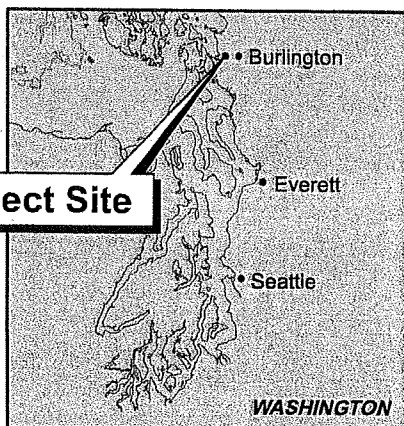
Enclosures



Skagit County Airport

Skagit Farmers
Supply Site

Note: Aerial photo from Terraserver.com



Project Site

48° 28' 13.88"
122° 25' 46.55"

0 1,400 2,800

Approximate Scale in Feet

Former Skagit Farmers Supply Site
Burlington, Washington

Vicinity Map

12053-18 Corps Ref# NWS-2008-19-N0

6/08

HARTCROWSER

Figure

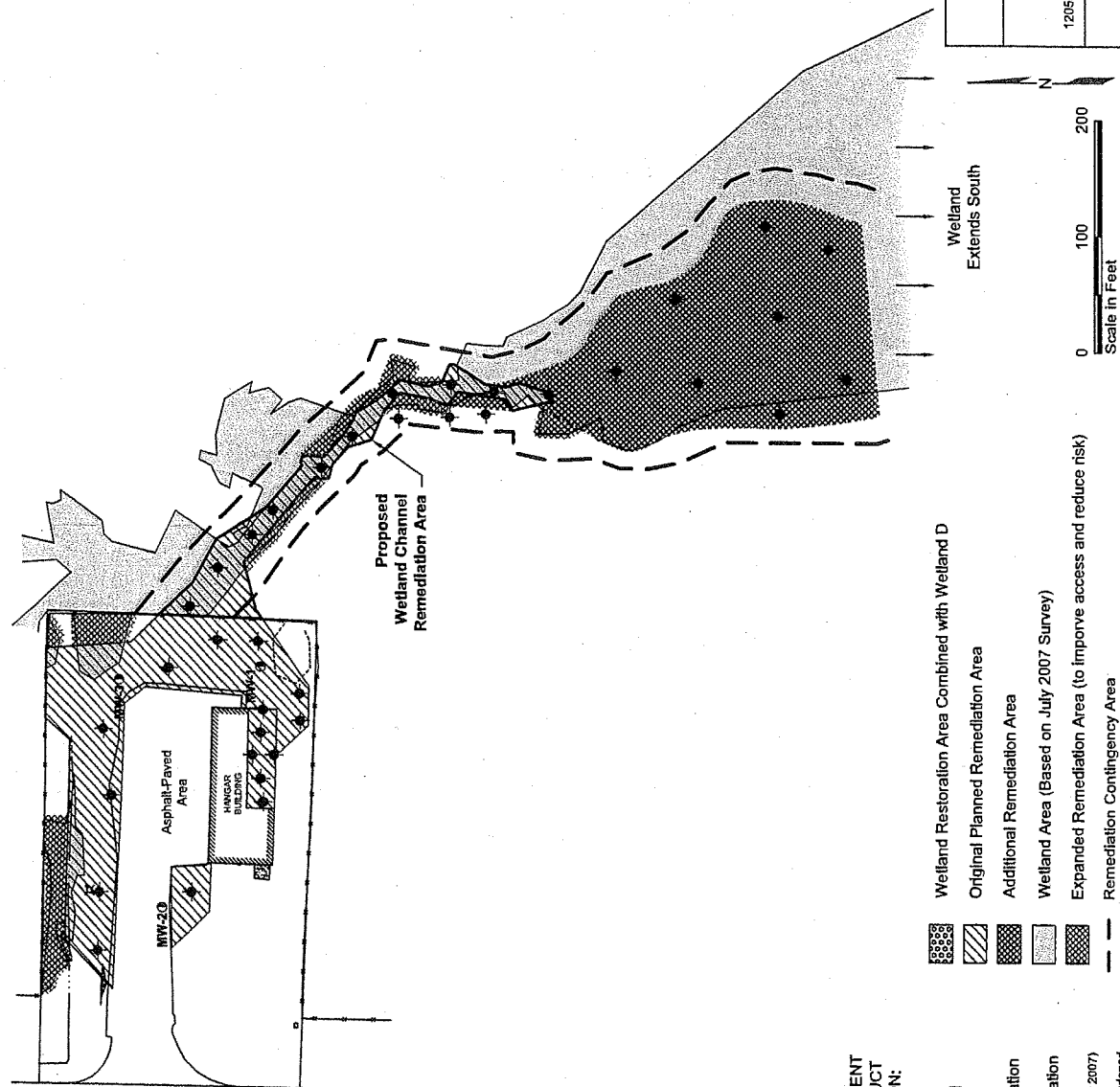
1 of 2

CONFIDENTIAL: PRIVILEGED ATTORNEY-CLIENT
COMMUNICATION ATTORNEY WORK PRODUCT
PREPARED IN ANTICIPATION OF LITIGATION:
RESTRICTED DISTRIBUTION

MW-10 2004 Groundwater Monitoring Well
Location and Number

- Proposed Verification Sample Location
- Additional Verification Sample Location

Note:
1. Refer to the Wetland Restoration Plan (Hart Crowliser 2007) for additional wetland delineation information.
2. Monitoring wells MW-1, MW-2, and MW-3 to be abandoned.



Former Skagit Farmers Supply Site
Burlington, Washington

Facility Remediation Areas and
Verification Sample Location Plan

12053-18 NWJ-2003-04-NO 6/08

Figure

HART CROWLISER

2 of 2



US Army Corps
of Engineers®
Seattle District

NATIONWIDE PERMIT 38

Terms and Conditions

Effective Date: September 10, 2007



-
- A. Description of Authorized Activities
 - B. Corps National General Conditions for all NWP's
 - C. Corps Seattle District Regional General Conditions
 - D. Corps Regional Specific Conditions for this NWP
 - E. State 401 Certification General Conditions
 - F. State 401 Certification Specific Conditions for this NWP
 - G. EPA 401 Certification General Conditions
 - H. EPA 401 Certification Specific Conditions for this NWP
 - I. Spokane Tribe of Indians 401 Certification General Conditions
 - J. Tribal 401 Certification Specific Conditions for this NWP
 - K. CZM Consistency Response Specific Conditions for this NWP
 - L. Additional Limitations on the Use of NWP's
-

In addition to any special condition that may be required on a case-by-case basis by the District Engineer, the following terms and conditions must be met, as applicable, for a Nationwide Permit 38 authorization to be valid in Washington State.

A. DESCRIPTION OF AUTHORIZED ACTIVITIES

38. Cleanup of Hazardous and Toxic Waste. Specific activities required to effect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority. Court ordered remedial action plans or related settlements are also authorized by this NWP. This NWP does not authorize the establishment of new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 27.) (Sections 10 and 404)

Note: Activities undertaken entirely on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site by authority of CERCLA as approved or required by EPA, are not required to obtain permits under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.

B. CORPS NATIONAL GENERAL CONDITIONS FOR ALL NWP's

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation. (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States. (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP's 4 and 48.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable

date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.

15. Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

16. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

17. Endangered Species. (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed. (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. (c) Non-federal permittees shall notify the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed. (d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs. (e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the U.S. FWS or the NMFS, both lethal and non-lethal "takes" of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their World Wide Web pages at <http://www.fws.gov/> and <http://www.noaa.gov/fisheries.html> respectively.

18. Historic Properties. (a) In cases where the district engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied. (b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. (c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of

Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed. (d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed. (e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, explaining the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

19. Designated Critical Resource Waters. Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, state natural heritage sites, and outstanding national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the district engineer after notice and opportunity for public comment. The district engineer may also designate additional critical resource waters after notice and opportunity for comment. (a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, and 50 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters. (b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 27, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

20. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal: (a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site). (b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal. (c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10 acre and require pre-construction notification, unless the district engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. For wetland losses of 1/10 acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered. (d) For losses of streams or other

open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream restoration, to ensure that the activity results in minimal adverse effects on the aquatic environment. (e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWP. For example, if an NWP has an acreage limit of 1/2 acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2 acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs. (f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses. (g) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan. (h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

21. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

22. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

23. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

24. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

25. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated

liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

26. Compliance Certification. Each permittee who received an NWP verification from the Corps must submit a signed certification regarding the completed work and any required mitigation. The certification form must be forwarded by the Corps with the NWP verification letter and will include: (a) A statement that the authorized work was done in accordance with the NWP authorization, including any general or specific conditions; (b) A statement that any required mitigation was completed in accordance with the permit conditions; and (c) The signature of the permittee certifying the completion of the work and mitigation.

27. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, as a general rule, will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity: (1) Until notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or (2) If 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 17 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 18 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that is “no effect” on listed species or “no potential to cause effects” on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) is completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee cannot begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information: (1) Name, address and telephone numbers of the prospective permittee; (2) Location of the proposed project; (3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided result in a quicker decision.); (4) The PCN must include a delineation of special aquatic sites and other waters of the United States on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters of the United States, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, where appropriate; (5) If the proposed activity will result in the loss of greater than 1/10 acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan. (6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the

PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and (7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWP and the need for mitigation to reduce the project's adverse environmental effects to a minimal level. (2) For all NWP 48 activities requiring pre-construction notification and for other NWP activities requiring pre-construction notification to the district engineer that result in the loss of greater than 1/2-acre of waters of the United States, the district engineer will immediately provide (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy of the PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5. (3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act. (4) Applicants are encouraged to provide the Corps multiple copies of pre-construction notifications to expedite agency coordination. (5) For NWP 48 activities that require reporting, the district engineer will provide a copy of each report within 10 calendar days of receipt to the appropriate regional office of the NMFS.

(e) District Engineer's Decision: In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If the proposed activity requires a PCN and will result in a loss of greater than 1/10 acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for projects with smaller impacts. The district engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the district engineer will notify the permittee and include any conditions the district engineer deems necessary. The district engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the district engineer to be minimal, the district engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the district engineer determines that the adverse effects of the proposed work are more than minimal, then the district engineer will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation plan that would reduce the adverse effects on the aquatic environment to the minimal level. When mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan.

28. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

C. Corps Seattle District Regional General Conditions

1. Aquatic Resources Requiring Special Protection. The following restrictions apply to activities in Washington State requiring Department of the Army authorization:

(a) Activities resulting in a loss of waters of the United States in a mature forested wetland, bog, bog-like wetland, aspen-dominated wetland, or alkali wetland are not authorized by NWP, except the following NWPs:

- NWP 3 – Maintenance
- NWP 20 – Oil Spill Cleanup
- NWP 32 – Completed Enforcement Actions
- NWP 38 – Cleanup of Hazardous and Toxic Waste
- NWP 47 – Pipeline Safety Program Designated Time Sensitive Inspections and Repairs

(b) For activities in or affecting a mature forested wetland, bog, bog-like wetland, wetland in a dunal system along the Washington coast, vernal pool, aspen-dominated wetland, alkali wetland, camas prairie wetland, or marine water with eelgrass beds (except for NWP 48) *and not prohibited by the preceding general regional condition 1.a.*, the permittee must submit a pre-construction notification to the District Engineer in accordance with Nationwide Permit General Condition 27 (Pre-Construction Notification).

2. Access. You must allow representatives of this office to inspect the authorized activity at any time deemed necessary to ensure that the work is being, or has been, accomplished in accordance with the terms and conditions of your permit.

3. Commencement Bay. Activities requiring Department of the Army authorization and located in the Commencement Bay Study Area are not authorized by the following NWPs:

- NWP 12 – Utility Line Activities (substations)
- NWP 13 – Bank Stabilization
- NWP 14 – Linear Transportation Projects
- NWP 23 – Approved Categorical Exclusions
- NWP 29 – Residential Developments
- NWP 39 – Commercial and Institutional Developments
- NWP 40 – Agricultural Activities
- NWP 41 – Reshaping Existing Drainage Ditches
- NWP 42 – Recreational Facilities
- NWP 43 – Stormwater Management Facilities

4. Bank Stabilization. All bank stabilization projects require pre-construction notification to the District Engineer in accordance with Nationwide Permit General Condition 27 (Pre-Construction Notification). Each notification must include a planting plan using native riparian plant species unless the applicant demonstrates that a planting plan is

not appropriate or not practicable. Each notification must also include the following information, except as waived by the District Engineer:

- (a) Need for the work, including the cause of the erosion and the threat posed to structures, infrastructure, and/or public safety.
- (b) Current and expected post-project sediment movement and deposition patterns in and near the project area.
- (c) Current and expected post-project habitat conditions, including the presence of fish, wildlife and plant species in the project area.
- (d) Demonstration that the proposed project incorporates the least environmentally damaging practicable bank protection methods. These methods include, but are not limited to, the use of bioengineering, biotechnical design, root wads, large woody debris, native plantings, and beach nourishment in certain circumstances. If rock must be used due to site erosion conditions, explain how the bank stabilization structure incorporates elements beneficial to fish.
- (e) Assessment of the likely impact of the proposed work on upstream, downstream and cross-stream properties (at a minimum the area assessed should extend from the nearest upstream bend to the nearest downstream bend of the watercourse). Discuss the methodology used for determining effects.

NOTE: Information on designing bank stabilization projects can be found in the Washington Department of Fish and Wildlife's *Integrated Streambank Protection Guidelines* (<http://www.wdfw.wa.gov/hab/ahg/ispdoc.htm>); King County's *Reconnaissance Assessment of the State of the Nearshore Ecosystem* (<http://dnr.metrokc.gov/wlr/watersheds/puget/nearshore/sonr.htm>); and three technical (white) papers – *Marine and Estuarine Shoreline Modification Issues*, *Ecological Issues in Floodplains and Riparian Corridors*, and *Over-Water Structures: Marine, Freshwater, and Treated Wood Issues* (<http://wdfw.wa.gov/hab/ahg/ahgwhite.htm>).

5. **Cultural Resources and Human Burials.** Permittees must immediately stop work and notify the District Engineer within 24 hours if, during the course of conducting authorized work, human burials, cultural resources, or historic properties, as identified by the National Historic Preservation Act, are discovered and may be affected by the work. Failure to stop work in the area of discovery until the Corps can comply with the provisions of 33 CFR 325 Appendix C, the National Historic Preservation Act, and other pertinent laws and regulations could result in a violation of state and federal laws. Violators are subject to civil and criminal penalties.

6. **Essential Fish Habitat.** An activity which may adversely affect essential fish habitat, as identified under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), may not be authorized by NWP until essential fish habitat requirements have been met by the applicant and the Corps. Non-federal permittees shall notify the District Engineer if essential fish habitat may be affected by, or is in the vicinity of, a proposed activity and shall not begin work until notified by the District Engineer that the requirements of the essential fish habitat provisions of the MSA have been satisfied and the activity is authorized. The notification must identify the type(s) of essential fish habitat (i.e., Pacific salmon, groundfish, and/or coastal-pelagic species) managed by a Fishery Management Plan that may be affected. Information about essential fish habitat is available at <http://www.nwr.noaa.gov/>

7. **Vegetation Protection and Restoration.** Permittees must clearly mark all construction area boundaries before beginning work and minimize the removal of native vegetation in riparian areas and wetlands to the maximum extent practicable. Areas subject to temporary vegetation removal in wetlands or riparian areas during construction shall be replanted with appropriate native species by the end of the first planting season following the disturbance except as waived by the District Engineer.

D. Corps Regional Specific Conditions for this NWP: None

E. State 401 Certification General Conditions

1. **For in-water construction activities.** Individual 401 review is required under this condition for projects or activities authorized under NWPs that will cause, or be likely to cause or contribute to an exceedance of a State water quality standard (WAC 173-201A) or sediment management standard (WAC 173-204).

State water quality standards can be located on Ecology's website: <http://www.ecv.wa.gov/programs/wq/swqs/>.

Sediment management standards can be located on Ecology's website:

<http://www.ecy.wa.gov/biblio/wac173204.html>.

Information is also available by contacting Ecology's Federal Permit staff.

2. Projects or Activities Discharging to Impaired Waters. Individual 401 review is required by this condition for projects or activities authorized under NWP's if the project or activity may result in further exceedences of a specific parameter the waterbody is listed for on the state's list of impaired waterbodies (the 303(d) list).

The current 303(d) listed waterbodies can be identified using search tools available on Ecology's website:

<http://www.ecy.wa.gov/programs/wq/303d/2002/2002-index.html> or by contacting Ecology's Federal Permit staff.

3. Notification. For projects or activities that will require individual 401 review, applicants must provide Ecology with the written documentation provided to the Corps (as described in Corps Nationwide Permit General Condition 27, Pre-Construction Notification), including, when applicable:

(a) A description of the project, including site plans, project purpose, direct and indirect adverse environmental effects the project would cause, any other Department of the Army permits used or intended to be used to authorize any part of the proposed project or any related activity.

(b) Delineation of special aquatic sites and other waters of the United States. Wetland delineations must be prepared in accordance with the current method required by the Corps and shall include Ecology's Wetland Rating form. *Note: Forms are available at Ecology's Wetlands website:*

<http://www.ecy.wa.gov/programs/sea/wetlands/index.html> or by contacting Ecology's Federal Permit staff.

(c) Coastal Zone Management Program "Certification of Consistency" Form if the project is located within a coastal county (Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Mason, Pacific, Pierce, San Juan, Skagit, Snohomish, Thurston, Wahkiakum, and Whatcom counties).

Note: Forms are available at the Army Corps of Engineers website: <http://www.nws.usace.army.mil> or by contacting Ecology's Federal Permit staff.

(d) Other applicable requirements of Corps Nationwide Permit General Condition 27, Corps Regional Conditions, or notification conditions of the applicable NWP.

Ecology's review time shall not begin until the applicable documents noted above have been provided to Ecology and Ecology has received a copy of the final Nationwide Permit verification letter from the Corps.

4. Aquatic resources requiring special protection. Certain aquatic resources are unique, difficult-to-replace components of the aquatic environment in Washington State. Activities that would affect these resources must be avoided to the greatest extent possible. Compensating for adverse impacts to high value aquatic resources is typically difficult, prohibitively expensive, and may not be possible in some landscape settings. Individual 401 review is required for activities in or affecting the following aquatic resources (and not prohibited by Regional Condition 1), except for:

- NWP 20 – Oil Spill Cleanup
- NWP 32 – Completed Enforcement Actions
- NWP 38 – Cleanup of Hazardous Waste
- NWP 47 – Pipeline Safety Program Repair

(a) Wetlands with special characteristics (as defined in the Washington State Wetland Rating Systems for western and eastern Washington, Ecology Publication #s04-06-025 and #04-06-015):

- estuarine wetlands
- Natural Heritage wetlands
- Bogs
- old-growth and mature forested wetlands
- wetlands in coastal lagoons
- interdunal wetlands
- vernal pools
- alkali wetlands

- (b) Bog-like wetlands, aspen-dominated wetlands, camas prairie wetlands, and marine water with eelgrass beds (except for NWP 48).
- (c) Category I wetlands
- (d) Category II wetlands with a habitat score >29 points.

5. Mitigation. 401 Certification is based on adequate compensatory mitigation being provided for wetland and other water quality-related impacts of projects or activities authorized under the NWP Program.

Mitigation plans submitted for Ecology review and approval shall be based on the guidance provided in Wetland Mitigation in Washington State, Parts 1 and 2 (Ecology Publication #s06-06-011a and #06-06-011b) and shall, at a minimum, include the following:

- (a) A description of the measures taken to avoid and minimize impacts to wetlands and other waters of the U.S.
- (b) The nature of the proposed impacts (i.e., acreage of wetlands and functions lost or degraded)
- (c) The rationale for the mitigation site that was selected
- (d) The goals and objectives of the compensatory mitigation project
- (e) How the mitigation project will be accomplished, including proposed performance standards for measuring success and the proposed buffer widths
- (f) How it will be maintained and monitored to assess progress towards goals and objectives. Monitoring will generally be required for a minimum of five years. For forested and scrub-shrub wetlands, 10 years of monitoring will often be necessary.
- (g) How the compensatory mitigation site will be legally protected for the long-term.

Refer to Wetland Mitigation in Washington State – Part 2: Developing Mitigation Plans (Ecology Publication #06-06-011b) for guidance on developing mitigation plans.

Ecology encourages the use of alternative mitigation approaches, including advance mitigation and other programmatic approaches, such as mitigation banks and programmatic mitigation areas at the local level. If you are interested in proposing use of an alternative mitigation approach, consult with the appropriate Ecology regional staff person. (see <http://www.ecy.wa.gov/programs/sea/wetlands/contacts.htm>)

For information on the state wetland mitigation banking program go to:

<http://www.ecy.wa.gov/programs/sea/wetlands/mitigation/banking/index.html>

6. Temporary Fills. Individual 401 review is required for any project or activity with temporary fill in wetlands or other waters of the State for more than 90 days, unless the applicant has received written approval from Ecology.

7. Mill Creek Special Area Management Plan. This condition applies to all NWPs within the boundaries described in the Mill Creek Special Area Management Plan (SAMP), King County, Washington, dated April 2000 (SAMP). The boundaries of the SAMP encompass all sub-basins and tributaries drained by Algona Creek, Auburn Creek, Bingaman Creek, Midway Creek, Mill Creek, and Mullen Slough. The area is bounded roughly on the south by 8th Avenue N in Algona and 4th Street NE in Auburn, on the east and north by the Ordinary High Water Mark of the Green River, and on the west by the plateau that parallels Interstate 5 above the Green River valley.

Individual 401 review is required for projects or activities authorized under the NWPs unless:

- (a) The project or activity will result in fill-related impacts to only wetlands designated as developable under Alternative #8, as shown on Figure 4-8 of the SAMP.
- (b) Compensatory mitigation for such impacts is onsite and/or within the areas designated on Figure 3-3, “Maximum Areas for Restoration by Target Habitat Type,” in the SAMP Aquatic Resources Restoration Plan (April 2000).
- (c) Mitigation plans comply with the requirements of the SAMP and, in general, with the guidance in the interagency Wetland Mitigation in Washington State (March 2006; Ecology publications #06-06-011a and #06-06-011b). Note: You can download the SAMP and Aquatic Resources Restoration Plan at http://www.nws.usace.army.mil/PublicMenu/Menu.cfm?sitename=REG&pagename=Mill_Creek_SAMP.

8. State Certification for PCNs not receiving 45-day response. In the event the U.S. Army Corps of Engineers does not respond to a complete pre-construction notification within 45 days, the applicant must contact Ecology for Individual 401 review.

F. State 401 Certification Specific Conditions for this NWP

Certified, subject to conditions. Individual 401 review is required for projects or activities authorized under this NWP if the project or activity is not authorized through a Model Toxics Control Act (MTCA) order or a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) order.

G. EPA 401 Certification General Conditions

In order for any NWP authorization to be valid in Washington State, permittees must comply with all applicable 401 Certification general conditions. EPA 401 Certification general conditions apply to all NWP authorizations involving Section 404 activities on Native American Indian Tribal lands (excluding the tribal lands of the Chehalis Tribes, Port Gamble S'Klallum Tribe, Kalispel Tribe, Makah Indian Tribe, Puyallup Tribe, Spokane Tribe, and Tulalip Tribe) and Federal land with exclusive jurisdiction within Washington State.

A. Special Aquatic Sites. Any activities in the following types of wetlands and waters of the U.S. will need to apply for an individual 401 certification: Mature forested wetlands; bogs; bog-like wetlands; wetlands in dunal systems along the Washington coast; vernal pools; aspen-dominated wetlands; alkali wetlands; camas prairie wetlands; salt marshes; or marine water with eelgrass beds.

B. Soil Erosion and Sediment Controls. An individual 401 certification is based on the project or activity meeting established turbidity levels. EPA will be using as guidance the state of Washington's water quality standards [WAC 173-201a] and sediment quality standards [WAC 173-204]. Projects or activities that are expected to exceed these levels or that do exceed these levels will require an individual 401 certification.

C. Compliance with Stormwater Provisions. Individual 401 certification is required for projects or activities not designed in accordance with Ecology's most recent stormwater manual or Ecology approved equivalent manual.

D. Compliance with requirements of the National Pollutant Discharge Elimination System. For projects and activities requiring coverage under an NPDES permit, certification is based on compliance with the requirements of that permit. Projects and activities not in compliance with NPDES requirements will require individual 401 certification.

E. Projects or Activities Discharging to Impaired Waters. Individual 401 certification is required for projects or activities authorized under NWPs if the project will discharge to a waterbody on the list of impaired waterbodies (the 303(d) List) *and* the discharge may result in further exceedence of a specific parameter the waterbody is listed for.

EPA may issue 401 certification for projects or activities that would result in further exceedence or impairment if mitigation is provided that would result in a net decrease in listed contaminants or less impairment in the waterbody. This determination would be made during individual 401 certification review.

F. Notification. For projects requiring individual 401 certification, applicants must provide EPA with the same documentation provided to the Corps (as described in Corps National General Condition 27, Pre-Construction Notification), including, when applicable:

(a) A description of the project, including site plans, project purpose, direct and indirect adverse environmental effects the project would cause, any other U.S. Department of the Army permits used or intended to be used to authorize any part of the proposed project or any related activity.

(b) Delineation of special aquatic sites and other waters of the United States. Wetland delineations must be prepared in accordance with the current method required by the Corps.

(c) A statement describing how the mitigation requirement will be satisfied. A conceptual or detailed mitigation or restoration plan may be submitted.

(d) Other applicable requirements of Corps National General Condition 27, Corps Regional Conditions, or notification conditions of the applicable NWP.

A request for individual 401 review is not complete until EPA receives the applicable documents noted above and EPA has received a copy of the final authorization letter from the Corps providing coverage for a proposed project or activity under the NWP Program.

G. Mitigation. An individual 401 certification is based on adequate compensatory mitigation being provided for wetland and other water quality-related impacts of projects or activities authorized under the NWP Program. Mitigation plans submitted shall be based on the Joint Agency guidance provided in *Wetland Mitigation in Washington State, Parts 1 and 2* (Ecology Publication #06-06-011a and #06-06-011b) and shall, at a minimum, include the following:

1. A description of the measures taken to avoid and minimize impacts to wetlands and other waters of the U.S.
2. The nature of the proposed impacts (i.e., acreage of wetlands and functions lost or degraded).
3. The rationale for the mitigation site that was selected.
4. The goals and objectives of the compensatory mitigation project.
5. How the mitigation project will be accomplished, including proposed performance standards for measuring success and the proposed buffer widths.
6. How it will be maintained and monitored to assess progress towards goals and objectives. Monitoring will generally be required for a minimum of five years. For forested and scrub-shrub wetlands, 10 years of monitoring will often be necessary.
7. How the compensatory mitigation site will be legally protected for the long-term.

H. Temporary Fills. An individual 401 certification is required for any activity where temporary fill will remain in wetlands or other waterbodies for more than 90 days. The 90 day period begins when filling activity starts in the wetland or other waterbody.

H. EPA 401 Certification Specific Conditions for this NWP

Partially denied without prejudice. Individual 401 review is required for projects authorized under this NWP if the project or activities are not part of an EPA ordered cleanup.

I. Spokane Tribe of Indians 401 Certification General Conditions

Specific to the Reservation and the Tribal Water Quality Standards, the applicant must comply with the following when there could be a discharge to waters of the Spokane Indian Reservation:

1. The applicant shall be responsible for achieving compliance with the Spokane Tribal Water Quality Standards.
2. The applicant shall submit copies of applications materials to the Spokane Tribal Water Control Board for review and approval at the same time they are submitted to Army Corps of Engineers and prior to any disturbance activities.
3. The applicant shall comply with all Spokane Tribal Integrated Resource Management Plan (IRMP) guidelines for land use activities and disturbances.
4. The applicant shall allow the Tribal Water Control board and Interdisciplinary Team to inspect the area in question and adopt recommendations made throughout its operation.

5. Monitoring of the discharge shall occur at a level indicated by EPA and the Tribe, are subject to change, and shall be submitted to both entities.

J. Tribal 401 Certification Specific Conditions for this NWP

Denied without prejudice by the Chehalis, Kalispel, Makah, Port Gamble S'Klallum, Puyallup, and Tulalip tribes. Certified subject to general conditions by the Spokane Tribe.

K. CZM Consistency Response Specific Conditions for this NWP

Concur, subject to the following condition:

1. Where individual 401 review is triggered, an individual CZM Consistency Response must be obtained for projects located within the 15 coastal counties. A "Certification of Consistency" form must be submitted in accordance with State General Condition 3 (Notification).

L. ADDITIONAL LIMITATIONS ON THE USE OF NWPs

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other Federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project.



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

RECEIVED

JUL 22 2010

PORT OF SKAGIT COUNTY

Regulatory Branch

July 20, 2010

Ms. Sara Young
Port of Skagit County
Post office Box 348
Burlington, Washington 98233

Reference: NWS-2008-19
Skagit County, Port of

Dear Ms. Young:

In your correspondence dated July 15, 2010, you requested a time extension to the referenced Nationwide Permit (NWP) 38 verification issued to you on July 17, 2008. The work authorized by NWP 38 involves excavation and the placement of fill in wetlands to clean up contaminated sediments. The work will occur in wetlands near Burlington, Skagit County, Washington.

We have reviewed your time extension request and verified that NWP 38 authorizes this project under current regulations. In order for this NWP authorization to be valid, you must ensure that the work is performed in accordance with the previously approved plans dated June 2008. You are cautioned that any change in project plans will require that you submit a copy of the revised plans to this office and obtain our approval before you begin work.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked on March 18, 2012. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before March 18, 2012, you will have until March 18, 2013 to complete the activity under the present terms and conditions of this NWP.

Failure to comply with all terms and conditions of this NWP verification invalidates this authorization and could result in a violation of Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899. Also, you must obtain all State and local permits that apply to this project. All other terms and conditions contained in the original NWP verification remain in full force and effect.

If you have any questions about this letter, please contact me at (360) 734-3156 or via email at randel.j.perry@usace.army.mil.

Sincerely,

Randel Perry, Project Manager
Regulatory Branch



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

February 15, 2011

Regulatory Branch

Port of Skagit County
Ms. Sara Young
Post office Box 348
Burlington, Washington 98233

Reference: NWS-2008-19
Skagit County, Port of

Dear Ms. Young:

In correspondence dated January 27, 2011, your agent, Ms. Fiona McNair, requested a modification to the referenced Nationwide Permit (NWP) 38 verification issued to you on July 17, 2008 and re-verified on July 20, 2010. The work authorized by NWP 38 involves excavation and the placement of fill in wetlands to clean up contaminated sediments. The work will occur in wetlands near Burlington, Skagit County, Washington.

We have reviewed your request and verified that NWP 38 authorizes this project under current regulations. In order for this NWP authorization to be valid, you must ensure that the work is performed in accordance with the enclosed approved modified plans dated January 14, 2011 and in accordance with the following modified special conditions "b" and "c":

b. The permittee must implement the provisions of the document titled, "*Updated Wetland Restoration Plan, Port of Skagit County – Taxiway F Site, Skagit County, WA,*" dated January 27, 2011 in their entirety.

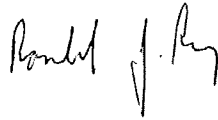
c. A status reports on the wetland and buffer remediation (restoration), including photos, must be submitted to the Corps, Seattle District, Regulatory Branch, 13 months from the date of this reverification. All reports must be submitted to the Corps, Seattle District, Regulatory Branch and must prominently display the reference number NWS-2008-19.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked on March 18, 2012. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before March 18, 2012, you will have until March 18, 2013 to complete the activity under the present terms and conditions of this NWP.

Failure to comply with all terms and conditions of this NWP verification invalidates this authorization and could result in a violation of Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899. Also, you must obtain all State and local permits that apply to this project. All other terms and conditions contained in the original NWP verification remain in full force and effect.

A copy of this correspondence with enclosures will be provided to Ms. Fiona McNair of GeoEngineers, Inc. at 600 Stewart Street, Suite 1700, Seattle, WA 98101. If you have any questions about this letter, please contact me at (360) 734-3156 or via email at randel.j.perry@usace.army.mil.

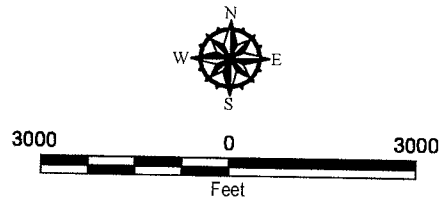
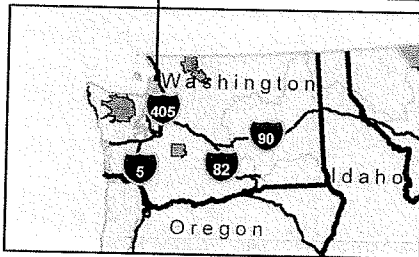
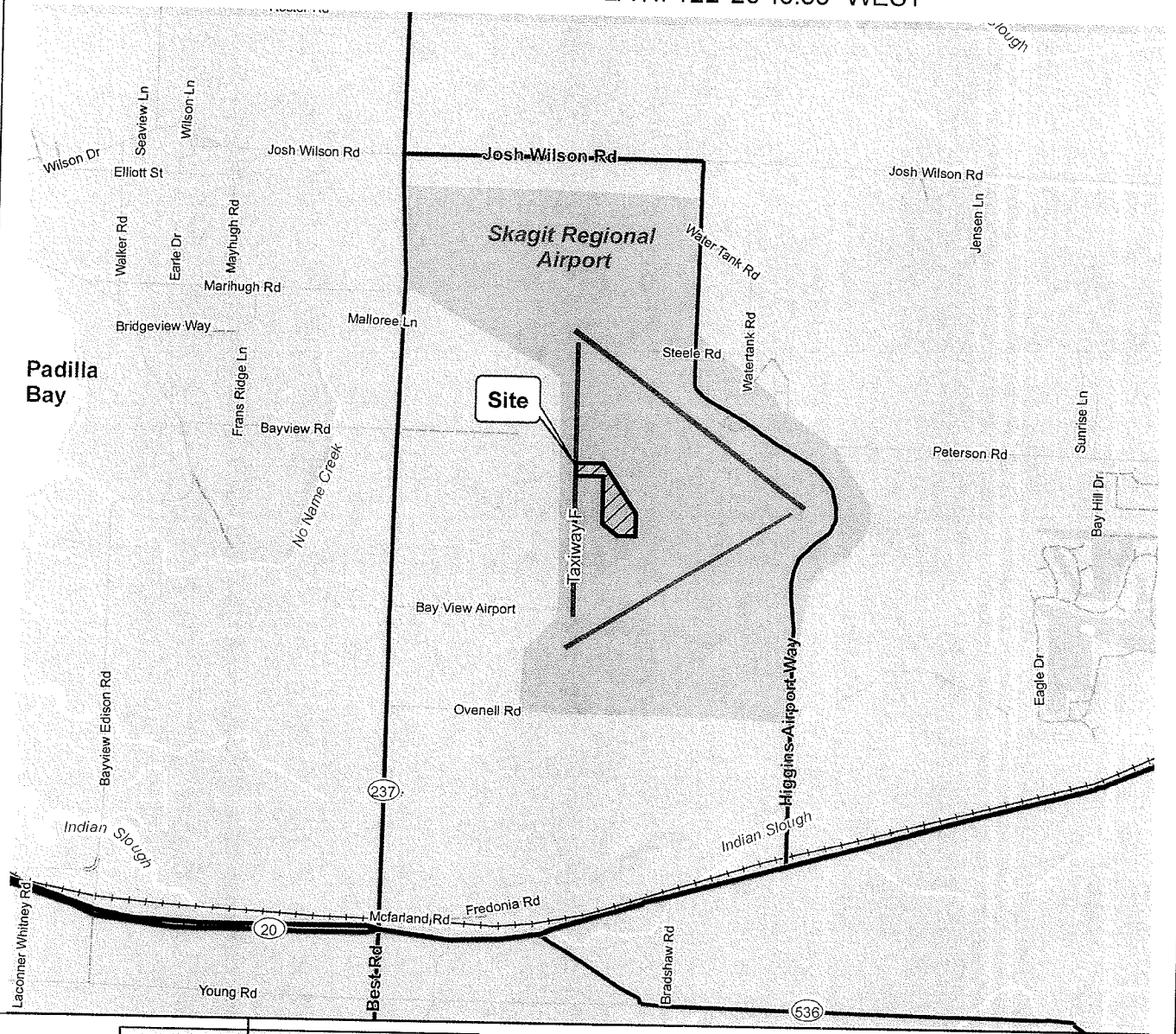
Sincerely,

A handwritten signature in black ink, appearing to read "Randel J. Perry". The signature is written in a cursive, flowing style.

Randel Perry, Project Manager
Regulatory Branch

SEC. 4, T34N, R03E, W.M.

LOG.: 48°28'13.85" NORTH - LAT.: 122°25'46.38" WEST



REFERENCE: ESRI DATA & MPAS, STREET MAPS 2005

PURPOSE:

REMOVE CONTAMINATED SOIL,
PLACE BACKFILL AND RESTORE.
REVERIFICATION OF PERMIT
(NWS-2008-19-~~NO~~)

ADJACENT PROPERTY OWNERS:
1. PORT OF SKAGIT COUNTY

VICINITY MAP

TAXIWAY F SITE
SKAGIT COUNTY, WA

IN: SKAGIT COUNTY
COUNTY OF: SKAGIT
STATE OF: WASHINGTON
APPLICATION BY:
PORT OF SKAGIT COUNTY

SHEET: 1 of 2
DATE: 01/14/11
CREATED BY: GEOENGINEERS, INC.

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OFFICE:SEA



- CURRENTLY PLANNED REMEDIATION AREA (95,886 ft²)
- FORESTED WETLAND RESTORATION AREA (25,519 ft²)
- EMERGENT WETLAND RESTORATION AREA (5,716 ft²)
- SCRUB-SHRUB WETLAND RESTORATION AREA (229 ft²)
- APPROXIMATE LIMITS OF WETLAND AREAS
(BASED ON HART CROWSER 2007 SURVEY)
- FENCE LINE

REMOVE CONTAMINATED SOIL,
PLACE BACKFILL AND RESTORE.
REVERIFICATION OF PERMIT
(NWS-2008-19-~~NO~~)

SITE PLAN WETLAND RESTORATION AREAS

TAXIWAY F SITE
SKAGIT COUNTY, WA

IN: SKAGIT COUNTY
COUNTY OF: SKAGIT
STATE OF: WASHINGTON
APPLICATION BY:
PORT OF SKAGIT COUNTY
SHEET: 2 of 2
DATE: 01/14/11
CREATED BY: GEOENGINEERS, INC.