D R A F T

ENVIRONMENTAL RESOURCES REPORT

BPA Transmission Line Brown Road to Custer Substation

Prepared for:

BP Cherry Point Refinery

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URS

1501 Fourth Avenue, Suite 1400
Seattle, WA 98101-1616
(206) 438-2700

33749546.05070

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1.0 INTRODUCTION

BP West Coast Products (BP) is proposing to connect a cogeneration power plant proposed for construction at the BP Cherry Point Refinery to an existing Bonneville Power Administration (BPA) transmission line. The greater loads that would be produced by the cogeneration facility may require installing new towers, relocating existing towers, and/or replacing transmission lines. URS conducted a reconnaissance investigation to determine the presence, geographic extent, and character of environmental and cultural resources along a section of the BPA's Custer-Intalco No. 2 transmission line located in Whatcom County, Washington. The study area includes the 125-foot transmission right-of-way (ROW) corridor from Brown Road to the Custer Substation, approximately 5 miles in length (Figure 1). The study assessed existing conditions of streams, wetlands, wildlife, and cultural resources within the ROW.

This report documents the work performed and describes environmental resources within the study area. Regulations relevant to the on-site resources and potential mitigation for upgrade of the transmission line corridor are also discussed.

The project area is located approximately seven miles southeast of the community of Blaine, Washington, about three miles inland from the southern extent of Birch Bay on the northern Washington coast and about 7.5 miles south of the international border. It can be found on the Blaine, Washington USGS 7.5' topographic quadrangles, in Sections 1, 2, 3, 4, 5, and 8, Township 39 N, Range 1E. The current project area extends from the north side of Brown Road, near the community of Kickerville, north about 0.5 miles across Grandview Road, and east 3.5 miles to the Custer substation, which is located just west of Interstate 5 (see Figure 1).

1.1 RELEVANT REGULATION

Impacts to streams and wetlands are regulated at the federal level by the Corps of Engineers (Corps) and the Environmental Protection Agency (EPA). Permit process and standards for the disposal of fill primarily derive from Section 404 of the Federal Water Pollution Control Act Amendments of 1972 (Clean Water Act), which authorizes the Corps to issue permits and authorizes the EPA to set environmental standards that must be met by each permit. Other laws, including the Fish and Wildlife Coordination Act (FWCA), National Environmental Policy Act (NEPA), and the Endangered Species Act (ESA), impose additional substantive and coordination obligations on the Corps, EPA, and other relevant agencies.

The Washington State Department of Ecology (Ecology) acts in lieu of the EPA to add conditions to permits as necessary through the 401 Water Quality Certification. Ecology may also regulate impacts to wetlands as authorized by the State Water Pollution Control Act (Chapter 90.48 RCW) and the Shoreline Management Act (SMA). Ecology may also use the State Environmental Policy Act (SEPA) process as a means to identify potential wetland-related concerns during the permitting process. The Washington State Department of Fish and Wildlife (WDFW) regulates impacts to streams as authorized by the Hydraulic Code.

Local governments are required to regulate impacts to streams and wetlands within their jurisdictions by the Washington State Growth Management Act. Whatcom County Planning & Development Services regulate these resources through the issuance of Fill and Grade permits.

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Numerous laws, regulations, and statutes at both the federal and state levels seek to protect and target the management of cultural resources. These include the Antiquities Act of 1906; Historic Sites Act of 1935; Reservoir Salvage Act of 1960; National Historic Preservation Act of 1966, as amended; National Environmental Policy Act of 1969; Executive Order 11593 (Protection and Enhancement of the Cultural Environment); Archaeological and Historical Preservation Act of 1974; American Indian Religious Freedom Joint Resolution of 1978; Archaeological Resources Protection Act of 1979; the Native American Graves Protection and Repatriation Act of 1990; and the State Environmental Policy Act (SEPA) of 1971 (RCW 43.21C), Public Lands Act (RCW 79), Forest Practices Act (RCW 76.09), Forest Practice Rules (WAC 222), Indian Graves Act (RCW 27.44), and Archaeology and Historic Preservation Act (WAC 25). Collectively, these regulations and guidelines establish a comprehensive program for the identification, evaluation, and treatment of cultural resources.

1.2 ENVIRONMENTAL SETTING

The project area is located within the Puget Trough physiographic province of Washington, which extends the entire length of the state from the Canadian border to Oregon. The northern portion of the province includes Puget Sound and the northern Washington coastline adjoining the Strait of Georgia. This portion of the province is a depressed, low-elevation glaciated area now partially submerged. The geology and topography result largely from a lobe of the cordilleran icecap that pushed into the area from the north during the Pleistocene epoch (Franklin and Dyrness 1988).

The study area lies within the western hemlock (*Tsuga heterophylla*) vegetation zone, the most extensive vegetation zone in western Washington and Oregon. This vegetation zone is characterized by a wet, cool maritime climate where late-successional forests are dominated by coniferous tree species such a western hemlock, western red cedar (*Thuja plicata*), and Douglas fir (*Pseudotsuga menziesii*) (Franklin and Dyrness 1988). As a result of extensive clearing of land for logging and agricultural pursuits, current vegetation in the project area is largely open pasture and mixed second growth forest that includes lowland deciduous, broad-leaf vegetation with some coniferous trees. Common species in these forests include red alder (*Alnus rubra*), birch (*Betula* spp.), and northern black cottonwood (*Populus trichocarpa*) (Reid 1999).

The plant communities present within the transmission line corridor are regularly to irregularly disturbed by livestock grazing and mowing by BPA. As a result, most of the study area is open pasture. In addition, there is a moderate amount of shrub-dominated habitat and the edges of nearby forests. A dirt road extends across most of the corridor to allow access for maintenance purposes.

2.0 METHODS

2.1 ENVIRONMENTAL RESOURCES

The investigation was conducted to estimate the location and extent of streams and wetlands within the study area. Channel dimensions, bank vegetation, and flow rates of on-site streams were noted. Wetland locations were identified and the locations of wetland boundaries were estimated and sketched on aerial photographs. Cursory observations of vegetation, soils and hydrology for both wetlands and uplands were made for the study site. Observations of wildlife on or near the study area during the investigation were also recorded. In addition, resources demonstrating presence of any priority habitats and species known to occur on or near the study area were consulted.

Documents reviewed to aid determination of wetlands, streams, and priority habitats and species in the study area and its vicinity were as follows:

- National Wetlands Inventory Map, Blaine, Washington, Quadrangle (USFWS 1989)
- USGS Topographic Maps, Blaine, Washington, Quadrangle (USGS 1991)
- *Soil Survey of Whatcom County Area, Washington* (Goldin 1992)
- BP Cherry Point Cogeneration Project, Application for Site Certification, Part III Technical Appendices, Appendix H (Golder Associates 2002)
- Priority Habitat and Species (PHS) database (WDFW 2003)
- Natural Heritage Program (NHP) database (DNR 2002)

2.1.1 Wetland Determination

Wetland determinations made during a reconnaissance level investigation are subject to change upon conducting a wetland delineation. A wetland delineation allows the opportunity to return to areas identified by the reconnaissance investigation and better determine locations of wetland boundaries. A wetland delineation must occur in areas where impacts are proposed before any wetland-related permits can be issued.

Wetland identification was made on site by wetland biologists using the 1987 U.S. Army Corps of Engineers (Corps) *Wetlands Delineation Manual* and the 1997 Washington State Department of Ecology (Ecology) *Wetland Identification and Delineation Manual* as guidelines. The 1997 Ecology methodology was developed to be consistent with the 1987 Corps Manual.

For regulatory purposes, wetlands are defined by the Corps (1987) as follows:

> Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil

conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

According to the two manuals, the following three characteristics usually must be present for an area to be identified as a wetland: (1) hydrophytic vegetation, (2) hydric soil, and (3) wetland hydrology. Hydrophytic vegetation consists of those plant species growing in water, in soil, or on a substrate that at least periodically lacks oxygen. Hydric soils are saturated, flooded, or ponded long enough during the growing season to become deoxygenated in the upper soil horizon. Wetland hydrology includes seasonal, periodic, or permanent inundation or soil saturation that creates anaerobic conditions in the soil for a portion of the growing season for wetland sufficient soil and vegetation to be maintained.

The growing season is the period when soil temperatures 19.7 inches below the ground surface are typically greater than 41 degrees Fahrenheit (5 degrees Celsius) according to the 1987 *Corps Wetlands Delineation Manual*. The growing season length for the area is approximately 223 days as determined by averaging growing season length given by Goldin (1992) for Bellingham and Blaine. This period occurs from March 12 to October 31.

The dominant plant species in each vegetation community were identified. Vegetation communities are defined here as a contiguous assortment of plants in a given area sharing similar environmental conditions. Dominant plants are those plant species that comprise at least 20 percent aerial cover of a given community.

The hydrophytic indicator status for each dominant species as designated by the US Fish and Wildlife Service for Region 9 (USFWS 1996) was used to determine whether the vegetation in each community is hydrophytic. To meet the hydrophytic vegetation criteria, more than 50% of the dominant species must have an indicator status of obligate, facultative wetland, and/or facultative. The facultative statuses are often modified using minus (-) or plus (+) symbols. For example, FAC+ species are considered to have a somewhat greater estimated probability of occurring in wetlands than FAC species, whereas FAC- species are considered to have a somewhat lesser estimated probability of occurring in wetlands than FAC species. Indicator status categories are defined in Table 1.

Table 1
Plant Species Wetland Indicator Categories

Indicator Category	Occurrence	Probability in Wetlands (estimated)
Obligate (OBL)	Occurs almost always in wetlands under natural conditions	>99%
Facultative Wetland (FACW)	Usually occurs in wetlands, but occasionally found in non-wetlands	67-99%
Facultative (FAC)	Equally likely to occur in wetlands and non-wetlands	34-66%
Facultative Upland (FACU)	Usually occurs in non-wetlands, but occasionally found in wetlands	1-33%
Upland (UPL)	Occurs almost always under natural conditions in non-wetlands in this region, but may occur in wetlands in another region	<1%

Soil observations were made in wetlands and adjacent upland areas by hand augering the upper horizons of the soil. Soil color and other characteristics used to indicate hydric soils were documented. Soil taxonomy and drainage class were determined by reviewing the results of the *Soil Survey of the Whatcom County Area*, Washington (Goldin 1992).

Soil in which any of the following indicators is present meets the criteria for hydric soil:

- **Gleyed soil (gray colors).** Gleyed soils develop when mineral soil is saturated or inundated for periods of time sufficient to result in anaerobic (no oxygen) conditions. Anaerobic conditions cause elements common in soil, such as iron and manganese, to exist in reduced forms that are usually bluish, greenish, or grayish in color. Soil colors are determined using a Munsell soil color chart (GretagMacbeth 2000), which has separate pages for gley-colored soils.

- **Low chroma matrix.** A low chroma matrix develops when mineral soil is saturated or inundated for substantial periods of time during the growing season (but not long enough to produce gleyed soil) to result in anaerobic (no oxygen) or hypoxic (low oxygen) conditions. A soil matrix is the portion of a given soil layer (usually more than 50 percent by volume) that has the predominant color. The Munsell soil color chart uses abbreviations to describe colors, for example, 10YR 3/2. In the abbreviation, the last number indicates chroma; a chroma of 1 or 2 is considered low. Soils with a matrix chroma of 2 are usually considered hydric when mottles are present. Mottles are rust-colored spots or blotches in the soil formed by the oxidation of iron compounds via fluctuating water levels.

- **High organic content.** Soil retains high levels of organic matter when saturation prevents decomposition over long periods, thus allowing organic debris to accumulate. Organic content is considered high if the soil is composed of more than 20 to 30 percent (threshold differs depending upon other soil characteristics) organic material by weight in a layer at least 8 inches thick located in the upper 32 inches of the soil profile.

- **Soils appearing on the hydric soils list.** A list of hydric soils has been compiled by the U.S. Department of Agriculture's National Technical Committee for Hydric Soils. Listed soils have reducing conditions for a significant portion of the growing season in a major portion of the root zone and are frequently saturated within 12 inches of the soil surface.

- **Other hydric indicators.** Other positive indicators of hydric soil include sulfide or "rotten egg" odor, aquic or peraquic moisture regimes, and the presence of iron or manganese concretions.

To determine whether a vegetation community has wetland hydrology, an area is examined for inundation, soil saturation, shallow groundwater tables, or other hydrologic indicators. An area in which soils are saturated to the surface for at least 5 to 12 percent of the growing season meets the criterion for wetland hydrology. Since the growing season in low elevation areas of

Whatcom County typically occurs from April 19 to October 21 (a total of 26.5 weeks), saturation is only required to occur here for at least 1.3 to 3.2 weeks to meet the wetland hydrology criterion. Seasonal changes in water levels and the effect of recent precipitation events must be considered when evaluating an area's hydrology. Wetland hydrology can also be inferred from the presence of any of the following indicators: watermarks on vegetation, drift lines, sediment deposits, water-stained leaves, surface-scoured areas, wetland drainage patterns, and/or oxidized root channels.

2.1.2 Aquatic Resource Classification

The aquatic resources observed on site were grouped into five categories: (1) streams, (2) seasonally saturated wetland areas, (3) seasonally inundated wetland areas, (4) semi-permanently/permanently inundated wetland areas (ponds), and (5) possible wetland areas.

Streams are characterized by unidirectional flow of water in a defined channel.

Categories 2, 3, and 4 classify wetlands according to hydrologic regime. Seasonally saturated wetland areas retain saturation at or near the surface of the soil for long periods, extending into the beginning of the growing season, but typically dry out substantially in the latter half of the growing season. Seasonally inundated wetland areas typically support shallow inundation for at least one month per year. These areas retain saturation at or near the surface of the soil for longer periods than seasonally saturated areas, but typically dry out substantially in the latter half of the growing season. Semi-permanently/permanently inundated wetland areas (ponds) typically retain inundation for most or all of the year and have some 'open water' area.

Possible wetlands are areas that contain some wetland indicators, but require further study to determine if they would be considered jurisdictional wetlands. If any of these areas are actually wetlands, they would be considered seasonally saturated wetland areas.

Wetlands were further classified according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). Under the Cowardin classification scheme, wetlands and deepwater habitats are grouped into systems based on shared hydrologic factors. These systems are as follows: palustrine, marine, estuarine, riverine, and lacustrine.

The palustrine system includes all nontidal wetlands dominated by trees, shrubs, emergent herbaceous plants, mosses, and/or lichens, and all such wetlands that occur in tidal areas where the salinity due to ocean-derived salts is below 5 parts per thousand. Wetlands included in the palustrine system are those commonly referred to as marshes, swamps, bogs, fens, prairies, seeps, and intermittent ponds.

Palustrine wetlands are divided into classes by the dominant vegetation. Forested wetlands or forested wetland communities are dominated by trees or arborescent shrubs greater than 20 feet tall with at least 30 percent cover. Scrub-shrub wetlands or scrub-shrub wetland communities are dominated by woody shrubs less than 20 feet tall with at least 30 percent cover. Emergent herbaceous wetlands or emergent herbaceous wetland communities are dominated by nonwoody, vascular plants with at least 30 percent cover. Open water areas of ponds are classified as palustrine unconsolidated bottom (PUB) communities, which are characterized by substrates with most particles smaller than stones and vegetation cover less than 30 percent.

Wetland Ratings and Buffers

Wetland were rated using Ecology's Four-Tier Wetlands Rating System (Ecology 1993). Ecology recognizes four categories of wetlands: Category I, Category II, Category III, and Category IV. These ratings would influence mitigation ratios if a permit from Ecology is required for the proposed construction.

Category I wetland contains the following criteria:

- Documented habitat for endangered or threatened fish or animal species or for potentially extirpated plant species recognized by state or federal agencies
- High quality native wetland communities, including documented Category I or II quality Natural Heritage wetland sites and sites which qualify as a Category I or II quality Natural Heritage wetland
- High quality regionally rare wetland communities with irreplaceable ecological functions
- Wetlands of exceptional local significance

Category II wetlands are those that meet the following criteria:

- Regulated wetlands that do not contain features outlined in Category I
- Documented habitats for sensitive plant, fish, or animal species recognized by federal or state agencies
- Rare wetland communities that are not of high quality
- Wetland types with significant functions that may not be adequately replicated through creation or restoration
- Regulated wetland contiguous with salmonid fish-bearing waters, including streams where flow is intermittent
- Regulated wetlands with significant use by fish and wildlife

Category II wetlands occur more commonly than Category I wetlands but still need a high level of protection.

Category III wetlands meet the following criteria:

- Regulated wetlands that do not contain features outlined in categories I, II, or IV

Category III wetlands are smaller, less diverse, and/or more isolated in the landscape than Category II wetlands. They occur more frequently, are difficult to replace, and need a moderate level of protection.

Category IV wetlands meet the following criteria:

- Regulated wetlands that do not meet the criteria or a category I or II wetland
- Isolated wetlands that are less than or equal to one acre in size; and have only one wetland class; and have only one dominant plant species
- Isolated wetlands that are less than or equal to two acres in size, and have only one wetland class and a predominance of exotic species

Category IV wetlands are the smallest, most isolated, and have the least diverse vegetation. These are wetlands that should be replaceable and, in some cases, can be improved from a habitat standpoint. These wetlands do provide important functions and values and should be protected to some degree. Regional differences may call for a more narrow definition of this category.

The Whatcom County Code (WCC) defines which wetlands will be regulated by Whatcom County. For those wetlands that will be regulated, the WCC identifies wetland classes based on specific criteria, and establishes wetland buffer requirements, development standards, permitted alterations, and mitigation requirements. Definitions of wetland classes, mitigation, and other important definitions that pertain to wetland regulation are promulgated in Chapter 16 of the code (WCC 16.16.800).

According to the WCC, non-regulated wetlands include:

- Areas in which wetlands were created by activity, intentional or unintentional, other than mitigation subsequent to July 1, 1990
- Isolated wetlands less than one-third acre in size
- Any wetland hydrologically isolated, with vegetation dominated by invasive species or pasture grasses, and the dominant functions of which are restricted to storm water storage/flood attenuation, and the functions of which are no greater than all alternative nonwetlands sites on the parcel of property in question

Regulated wetlands include all other wetlands according to WCC 16.16.620.

Buffer areas shall be established to protect wetland functions, according to WCC 16.16.240, Regulatory Requirements. All regulated wetlands shall be protected by a standard 100-foot buffer, except that:

- Isolated wetland areas not characterized as mature forested fens, sphagnum bogs, or estuarine wetlands shall be protected by a 50-foot buffer
- Isolated wet meadows shall be exempt from the standard buffer requirement when it is determined that the wetland functions are restricted primarily to storm water storage or attenuation.

2.2 CULTURAL RESOURCES

2.2.1 Preliminary Research Record Search and Literature Review

The cultural resources investigation of the proposed transmission line upgrade corridor was initiated with a record search and literature review at the Washington Office of Archaeology and Historic Preservation (OAHP), Olympia, Washington, on January 22, 2003. During the course of the record search, maps, site files, and Whatcom County survey report files were examined to determine the presence or absence of previously recorded archaeological sites within the project corridor, as well as the extent of previous archaeological survey coverage in the project vicinity. This review indicated that a number of investigations have occurred in the near vicinity, several of which were conducted for BP/ARCO in association with various developments related to the Cherry Point refinery. As a result of these and other studies, a number of archaeological sites have been identified in the general project vicinity. None of these, however, occur within the proposed construction corridor. Information on previous studies and recorded sites is presented below.

In addition to review of records on file at OAHP, historic US General Land Office (GLO) plats were examined to assess historic land use patterns and the potential for early historic sites or features in the project area. An 1860 GLO cadastral survey map for Township 39 North, Range 1 East confirms that the area had not been settled as of this date. No structures or other notable features were recorded with the exception of an unnamed trail leading from a marsh area for approximately one mile west to “Lake Terrill.” Similarly, a subsequent 1872 survey of lands immediately north of the project corridor (Township 40 North, Range 1 East) indicates the area was not developed at the time of the survey, as no historical features or structures were documented.

Patent records of the GLO were reviewed for information pertaining to early land claims and confirm that the area was not settled until the late 1800s. The earliest claims in the project area date to 1872 and were filed by Harriett Baxter (Section 8) and William Price Jones (Section 5); by the 1890s, a total of ten patentees held claims to those lands included in the project corridor. The majority of these land claims were filed from 1884 to 1894 under the authority of 3 Stat. 566 and the Homestead Entry Act (12 Stat. 392).

Previous Investigations in the Project Area

The Birch Bay area has been the focus of archaeological investigations since the 1960s, when staff from the University of Washington recorded the first sites in the area. Survey and testing projects under the direction of Garland Grabert, of Western Washington State College (now WWU) followed these studies. Between 1969 and 1971, Grabert and Larsen of WWSC performed construction testing and mitigation at the location of Birch Bay Village (Reid 1999:22).

In 1975, additional research around Birch Bay was conducted in conjunction with construction of a sewer system and wastewater treatment facility. Survey, testing, and trench-monitoring activities were conducted as part of these investigations. Several sites were identified as part of these studies, including 45WH09, discussed below. This initial study was followed the next year with survey and testing of proposed Birch Bay State Park facilities. In 1982, severe winter erosion exposed several burials at 45WH09, resulting in salvage and protection measures. Additional sites were tested to the north of the project area, on Semiahmoo Spit (Reid 1999:22).

Additional work in the project area includes a mitigation and salvage study along the southern shoreline of the bay (Reid 1996, 1997a), related to mitigation of the effects of construction activities; surveys on the southern portion of Birch Point (Reid 1997b, c); archaeological investigations associated with the widening of Birch Bay Drive and Birch Point Road (Reid 1999) and Lake Terrell and Mountain View roads (Reid 2001); archaeological investigations of the proposed Williams/BC Hydro pipeline crossing of Georgia Strait (Hess et al. 2000; Thompson et al. 2000; Maas 2001a and 2001b); inventory of a new sewer line from the Cherry Point refinery to the Birch Bay area (Kelly 2001); and a cultural resources inventory along the I-5 corridor for the proposed Washington Light Lanes Project from Seattle to Blaine (Juell et al. 2000). Finally, two recent projects in the immediate project vicinity include a cultural resources survey for BPA's Bellingham to Custer fiber optic corridor (Wilt 2002) and the investigation of the proposed BP cogeneration facility adjacent to the Cherry Point refinery (Whiteman et al. 2002).

Known Archaeological Sites in the Project Vicinity

The record search and literature review revealed that while no known archaeological sites are present within the actual project area, several sites are located within close proximity. These include several shell midden sites along the shoreline of Birch Bay, three or more miles to the west and northwest of the current area. These include sites 45WH09, 45WH66, 45WH72, and 45WH74, all of which were recorded during the WWSC investigations of the mid-1970s. Site 45WH22 is a small, interior shell midden located along Terrell Creek, one mile west of the project and about 1.5 miles inland from the shore of Birch Bay. Two miles west of the project area is site 45WH23, known as the Golgotha Church site. This site was recorded in 1969, and consists of a small number of flaked cobbles. It is also located over one mile from the shoreline.

Two additional sites in this area, recorded more recently, include 45WH569 and 598. The first of these is a historic-era farmstead, recorded in 2000, and located about 0.75 miles west of the westernmost extent of the current project. About 0.5 miles to the south, adjacent to the Cherry Point refinery, is 45WH598. This site is a small, ephemeral lithic scatter associated with charcoal and stained soil. It was discovered during shovel probing conducted in 2002 in conjunction with study of the proposed cogeneration facility (Whiteman et al. 2002).

Site 45WH30 is located on the bank of Terrell Creek about 0.35 miles east of the westernmost north-south leg of the project. Recorded in 1970, it consists of two conical earth mounds that may represent the remains of earth ovens.

Finally, about 1.5 miles north of the eastern project extent, near the community of Custer, is site 45WH35. This site consists of a small lithic scatter associated with stained soil recorded in 1972.

Additional sites, primarily coastal shell middens, are located to the north and south of the project area, well outside of the current study area.

The presence of these resources indicates that historic and prehistoric resources are present within the project vicinity, but are largely concentrated along the shoreline of Birch Bay. Extensive shell midden deposits are present in the coastal area, and human remains have been documented at these sites. Resources identified to date in the near vicinity of the project corridor, however, tend to be more ephemeral lithe scatters with limited subsurface deposits.

Native American Consultation

BP has maintained an active program of consultation with representatives of the Lummi Indian Nation with regard to ongoing and planned developments associated with the Cherry Point refinery and proposed cogeneration facilities. Recent inventory of the cogeneration facility was contracted to the Lummi Indian Nation and included tribal representatives in several aspects of the study (Whiteman et al. 2002). BP will submit information on the current undertaking to the Lummi Indian Nation, with a request for information on potential traditional cultural properties or other areas of concern in or near the corridor.

2.2.2 Field Investigation

Intensive archaeological inventory of the proposed construction corridor was conducted by URS archaeologists Michael S. Kelly and Sarah McDaniel on January 23-24, 2003. Inventory was conducted at 15 m contours, providing full coverage of the proposed 40 m (125-foot) corridor. The majority of the transmission line corridor is composed of open pasture. Consequently, ground visibility was limited across much of the corridor, with much the ground surface obscured by dense grasses. Consequently, during the course of the inventory, an effort was made to carefully examine exposed cuts and banks, rodent spoil piles, and other soil exposures. In addition, 15-cm soil probes were excavated at periodic intervals along the length of the corridor, each excavated to average depths of 40-60 cm or more, depending on soil composition and subsurface water levels. Soil probes were specifically placed at anticipated tower locations, which will be placed at average intervals of 900 feet. Probing indicated the presence of heavy clay sediments across a majority of the project areas, with very few pebbles, gravels, or other materials present. Standing water was present along much of the corridor. In all areas, subsurface sediments were extremely wet, and in most locations, groundwater was encountered at depths as little as 10-15 cm below the surface.

3.0 RESULTS

3.1 ENVIRONMENTAL RESOURCES

3.1.1 Aquatic Resource Classification

To simplify reporting of the findings, aquatic resources were grouped into five categories: streams, seasonally saturated wetland areas, seasonally inundated wetland areas, semi-permanently/permanently inundated wetland areas (ponds), and possible wetland areas. The wetland areas were further classified according to *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979)., Upland areas also briefly described.

In addition, the transmission line was divided into five one mile-long segments beginning at the Custer Substation and ending at the BP interconnection point. The Custer Substation is the farthest point northeast that the route travels whereas the BP interconnection point is at the southwest terminus of the route studied. Five streams, thirty wetlands and four potential wetland areas were identified. Each resource category is first characterized, then individual wetlands and streams are briefly described as they occur under their respective transmission line segment. Wildlife in the study area is also discussed.

Streams

The transmission line corridor crosses parts of the California Creek and Terrell Creek sub-basin. Five streams were found within the 5-mile long study area: California Creek , two unnamed streams that feed California Creek, Fingalson Creek, and Terrell Creek . Other ditches and swales are present within the corridor, but are typically associated with wetlands and are described in the subsequent sections. Terrell Creek and California Creek each provide habitat for anadromous fish and discharge into Birch Bay. Fingalson Creek provides habitat for anadromous fish for a portion of its length, but a barrier to fish passage is present within mile four of the transmission line, limiting usage to resident fish only. Fingalson Creek connects to Terrell Creek within mile four of the transmission line.

Seasonally Saturated Wetland Areas

Every wetland surveyed in the study support seasonally saturated areas. Several wetlands consisted entirely of seasonally saturated areas and contained no other type of hydrologic regime. These areas were either situated in a slight depression or on a slope, but none had standing water present during the field investigation. Most wetlands, including most seasonally saturated wetland areas, are hydrologically connected to one of the streams mentioned above. The typical soil in these wetland areas is a dark brown silt loam (chroma of 1 or 2) with visible mottling.

The majority of seasonally saturated wetland areas found on site support PEM wetland communities. As mentioned earlier, PEM wetlands are dominated by herbaceous vegetation. Most of the PEM wetlands within the study area are actively grazed, regularly mowed, or have been disturbed by historical agricultural practices. The PEM wetland communities within seasonally saturated areas are classified as palustrine emergent, temporarily flooded (PEMA) wetland areas. Vegetation in PEMA wetlands on site is typically dominated by non-native herbaceous plants such as oft rush (*Juncus effusus*) and non-native pasture grasses such as reed canarygrass (*Phalaris arundinacea*), bentgrass (*Agrostis* sp.), and velvetgrass (*Holcus lanatus*).

A few scrub-shrub (PSS) communities and one forested (PFO) wetland community inhabit seasonally inundated areas as well. BPA maintains most shrubs to a certain height (approximately 25 feet). In most areas, trees growing in PSS wetlands are removed or topped by BPA to maintain a safe distance between the lines and vegetation. Vegetation dominating PSS wetland communities within seasonally inundated areas include Douglas spirea (*Spiraea douglasii*), salmonberry (*Rubus spectabilis*), immature red alder (*Alnus rubra*), rose (*Rosa* sp.), and snowberry (*Symphocarpos albus*).

The only PFO community that occurred within the study area was found in a seasonally saturated area. However, a very small patch of standing water was found within this community away from where any trees were rooted. The community occurs within Wetland O and is dominated by mature paper birch (*Betula papyrifera*) and red alder.

Seasonally Inundated Wetland Areas

Most of the wetlands surveyed support seasonally inundated areas, which are typically contiguous with seasonally saturated wetland areas. They are situated in depressions and supported standing water during the investigation. Some of the seasonally inundated wetland areas are situated near or within the bounds of a shallow pond. The typical soil in these wetland areas is a dark brown silt loam (chroma of 1 or 2) with visible mottling.

As with seasonally saturated wetland areas, the majority of seasonally inundated wetland areas support PEM communities. Vegetation in the PEM portions of the seasonally inundated areas is typically dominated by non-native herbaceous plants such as soft rush and creeping buttercup (*Ranunculus repens*) and non-native pasture grasses such as reed canarygrass, cattail (*Typha latifolia*), and bentgrass.

A moderate proportion of the PSS communities present in the study area are found in seasonally inundated areas. BPA maintains most shrubs to a certain height (approximately 25 feet). Vegetation dominating PSS wetlands within seasonally inundated areas include Douglas spirea (*Spiraea douglasii*), Sitka willow (*Salix sitchensis*), and red-osier dogwood (*Cornus sericea*).

Semi-permanently/Permanently Inundated Wetland Areas (Ponds)

Several of these wetlands contain ponds that are either permanently or semi-permanently inundated. The ponds range in size from less than 1 acre to greater than 5 acres and range in depth from a few inches to perhaps 2 feet or more. These ponds are predominantly ‘open water’ areas, but often support a patch of vegetation within their bounds and/or along the fringe. Vegetation found within the ponds includes both shrubs and emergent plants.

Possible Wetland Areas

Four areas were identified as possible wetlands (see Figures 2-A through 2-J). These areas are found in heavily grazed areas or disturbed fields where topography has been altered by motorized activity. The conditions present in these areas inhibited accurate identification of pre-disturbance vegetation and topography.

3.1.2 Uplands

Uplands within the study area are dense blackberry thickets, mowed fields, or grazed fields. The blackberry thickets are typically found near steep slopes and/or stream crossings, as with Terrell Creek. These areas include Himalayan blackberry (*Rubus armeniacus*) and evergreen blackberry (*Rubus lacinatus*), with occasional snowberry and salmonberry. Upland fields are dominated by tall fescue (*Festuca arundinacea*) and bentgrass, approximately 3 to 4 inches tall.

3.1.3 Streams and Wetlands by Transmission Line Segment

Figures 2-A through 2-J show streams and wetlands identified along the 5-mile transmission line route. The table below presents a summary of the amount of wetlands occurring with in the ROW. The span of each wetland within the study area parallel to the direction of the ROW corridor is quantified in linear feet. The buffer area widths shown in the table buffers are based on interpretation of Whatcom County Code Critical Areas Ordinance. These widths must be confirmed by Whatcom County Planning & Development Services.

Table 2
Summary of Wetlands in Right-of-Way (ROW)

Study Area Mile	Wetland	Location	Approximate length in ROW	Buffer Area Width
Mile 1	A	Between Tower 1/1 (substation) and 1/ 2 (Vista Drive)	1,200	100
	B	Southwest of Tower 1/ 2 and Vista Drive	100	100
	C	On both sides of Tower 1/3	250	50
	D	South of Tower 1/ 3 and Fox Road	125	100
	E	South of Tower 1/ 4	375	100
	F	North of Tower 1/ 5	300	100
	G	East of Tower 1/6	250	100
	H	East of Tower 1/6 and Olson Road	75	100
Mile 2	I	West of Olson Road	500	100
	J	West of Olson Road and Wetland Z	30	100
	K	East of Tower 2/1	40	100
	L	West of Tower 2/1	50	100
	M	West of Tower 2/2 and unnamed creek	130	100
	N	East of Elk Road	60	100
	O	West of Elk Road and East of Tower 2/4	375	100
	P	East of Tower 2/5 and Valley View Road	200	100
Mile 3	Q	West of Valley View Road	50	100
	R	On both sides of Tower 3/2	60	100
	S	On both sides of Tower 3/ 4	500	100
	T	East of Tower 3/5 and West of Yukon Road	30	100
Mile 4	U	West of Tower 3/5	125	100
	V	East of Tower 4/1	375	100
	W	West of Tower 4/1	375	100
	X	On both sides of Tower 4/2	40	100
	Y	West of Tower 4/2 and adjacent to eastern portion of Fingalson Creek	500	100
	Z	On both sides of Tower 4/3	150	100
	AA	West of Tower 4/4 and Terrell Creek	40	50
	BB	On both sides of Tower 4/5	300	100
Mile 5	CC	West of Tower 4/5 and Kickerville Road	180	100
	DD	On both sides of Tower 5/1	600	100
	EE	North of Grandview Road	60	100
	FF	South of Grandview Road and north of Tower 5/2	300	100
	GG	North of Tower 5/3	60	100
	HH	South of Tower 5/3 and north of Brown Road	850	100

Mile 1

Mile 1 of the transmission line extends from the Custer substation southwest across Vista Drive (Blaine-Ferndale Road) and Fox Road, then turns west ending just east of Olson Road (see Figures 2-A and 2-B). Within the Mile 1 study area there are six towers (1/1 through 1/6), one stream, seven wetlands, and one possible wetland area.

California Creek flows northwest across the transmission line ROW just southwest of the substation. At this location, the creek appears to have been straightened and the banks appear fairly stable. The channel is approximately 2 to 3 feet deep, 2 feet wide, and the upper part of the steep banks are almost entirely covered with reed canarygrass. A small amount of woody debris, mostly below 1 foot in diameter, was found in the creek. At the time of investigation, flow in the channel was approximately 5 to 7 cubic feet per second (cfs) and the water was very silty, limiting visibility to the upper 6 inches.

California Creek flows northwest through Wetland A, which is a PEM/PSS wetland that is approximately 1,200 feet in length (within the ROW) extending from the Custer Substation to near Vista Drive. Wetland A is a seasonally saturated wetland that drains mainly by subsurface pathways to California Creek. This is the largest wetland within the study area. The PEM portion of this wetland is dominated by reed canarygrass, bentgrass, and soft rush. The PSS portion is dominated by Douglas spirea, evergreen blackberry and clustered rose (*Rosa pisocarpa*). Near Tower 1/1, the PSS community contains some semi-mature red alder, paper birch, and Sitka willow. Wetland B is approximately 100 feet in length and located just southwest of Vista Drive and extends north of the ROW. It discharges north to a roadside ditch on the southwest side of Vista Drive. This PEM wetland appears regularly grazed and is dominated by bentgrass, fescue, and soft rush.

Wetland C is a possible wetland area approximately 250 feet in length located north of Fox Road and on both sides of Tower 1/3. It has no apparent outlet or flow channels. This PEM wetland also appears regularly grazed and is dominated by bentgrass and fescue with some soft rush and creeping buttercup.

Wetland D is approximately 125 feet in length extending along the eastern third of the ROW corridor, south of Fox Road. The wetland drains north to a ditch on the south side of Fox Road. This PEM wetland is dominated by reed canarygrass and bentgrass and extends across the grassy area east of the ROW.

Wetland E is approximately 375 feet in length and includes a pond that is approximately 1 acre in size. The pond is likely semi-permanently inundated but may occasionally draw down entirely during the latter half of the dry season. This wetland is a depressional system with no apparent outlet. A large portion of the PEM/PSS wetland community that surrounds the pond contained shallow standing water (2 inches deep) during the time of the investigation. This PEM/PSS wetland community is primarily vegetated by reed canarygrass, soft rush, with some red alder saplings and mature Sitka willow.

Wetland F is approximately 300 feet in length and is crescent-shaped extending outside the ROW. This PEM wetland has been disturbed by motor vehicles that created tracks that contain pools of standing water up to 2 inches deep. The wetland is drained by a seasonally flowing swale channel that flows north along the east edge of the ROW. The channel continues east into a red alder forest. Flow in this channel was very limited (<0.05 cfs) during the investigation. Vegetation present is primarily bentgrass, with some velvetgrass (*Holcus lanatus*) and creeping buttercup. Piggy-back plant (*Tolmiea menziesii*) is abundant in the less disturbed areas away from the vehicle tracks. Wetland G is approximately 250 feet in length and begins 300 feet west of Tower 1/5 and extends south of the ROW. It contains a seasonally to semi-permanently inundated pond that was 4-5 inches deep at the time of the investigation. An outflow swale from this wetland extends approximately 200 feet north to a topographically indistinct area where flow infiltrates below surface of the soil. A PEM community within this shallow pond supports forget-me-not (*Myosotis* sp.), foxtail (*Alopecurus* sp.), and Pacific water-parsley (*Oenanthe sarmentosa*). The PEM wetland community surrounding the pond is dominated by soft rush, bentgrass, and tall fescue. A small patch of semi-mature Douglas-fir (*Pseudotsuga menziesii*) is located on the west edge of the pond, near the edge of the ROW. Wetland H is approximately 75 feet in length and extends east from Tower 1/6. This PEM wetland is situated in a depression, but contains a swale channel that supports seasonal flow. The swale meanders across a gentle (<1%) slope outside of the study area to the west where it connects to a roadside ditch on the east side of Olson Road. Vegetation in the wetland is dominated by tall fescue, bentgrass, and creeping buttercup.

Mile 2

Mile 2 of the transmission line extends from a tower west of Olson Road to a tower just east of Valley View Road (see Figures 2-C through 2-E). Within the Mile 2 study area there are five towers (2/1 through 2/5), two streams, seven wetlands, and one possible wetland area.

Wetland I is approximately 500 feet in length and extends from the west edge of Olson Road east toward Tower 2/1. It is situated on an east-facing slope with a 3 to 5 percent grade. Several small pools of standing water 4 to 5 inches deep are present on small topographic benches occurring along the slope. The wetland discharges into a roadside ditch that flows north on the west side of Olson Road. This PEM wetland is dominated by tall fescue, soft rush, and bentgrass.

Wetland J is approximately 30 feet in length and consists of a narrow ditched swale that originates south of the ROW and flows northeast. This PEM wetland is dominated by bentgrass and velvetgrass, with some soft rush and creeping buttercup present. The swale is approximately 2 feet wide and 2 feet deep and is on a slope at 1 percent grade. Flow in the swale during the investigation was 2 inches deep.

Wetland K is approximately 40 feet in length and is located 125 feet east of Tower 2/1. This PEM wetland consists of a curving swale situated on a 2 percent slope and drains north of the ROW. Although no surface flow was observed, a small pool of standing water up to 3 inches in depth occurred in this wetland. Vegetation in the wetland swale is dominated by bentgrass, with some creeping buttercup and soft rush present.

Wetland L is approximately 50 feet in length and is located 60 feet west of Tower 2/1. A small creek flows north through the wetland in a channel that has been modified by ditching. The ditched stream channel is 8 inches wide and 8 inches high with fairly steep banks. The ditched channel crosses under a gravel road twice through 12-inch diameter culverts. The wetland and ditched creek are situated on a gentle north-facing slope. The creek is likely a tributary of California Creek. Vegetation in this PEM wetland is dominated by bentgrass, with some soft rush, velvetgrass, and clover (*Trifolium* sp.) present.

An unnamed creek flows north through the ROW, west of Tower 2/2. The creek is situated in a gully that is 50 feet wide and 30-foot deep. The creek flows north through a 24-inch culvert under a gravel access road that extends east-west along the south edge of the ROW. The creek is 10 to 15 feet wide and was flowing at less than 0.25 cfs at the time of the investigation. A larger creek, also unnamed, joins the smaller creek from the southeast within the ROW. This creek travels north under the gravel road through a 24-inch culvert before joining the smaller creek. The creek is likely a tributary of California Creek. The banks of both creeks and the confluence are strongly dominated by Himalayan blackberry. The associated riparian area south of the ROW is dominated by mature red alder, with some salmonberry, Douglas fir, and Himalayan blackberry.

Wetland M is approximately 130 feet in length and is located 250 feet east of Elk Road. This PEM wetland has been overgrazed by livestock and consequently contains much bare soil pocked by hoof prints. A thin layer of hay was present across most of the area to mitigate erosion. Standing water is present in portions of the wetland up to 1.5 inches deep. The wetland is a situated in a depression, but appears to release outflow to the north. Vegetation present is dominated by bentgrass, with some creeping buttercup, soft rush, and velvetgrass present.

Wetland N is approximately 60 feet in length and is located 50 east of Elk Road. It is situated on a north-facing slope with a low trickle flow through a narrow swale. This PEM wetland is dominated by foxtail, creeping buttercup, and bentgrass, with some soft rush present.

Wetland O is approximately 375 feet in length and is located approximately 500 feet west of Elk Road. This wetland is a PSS/PEM wetland that is connected to a PFO wetland south of the ROW. Standing water is present is in the PEM community up to 3 inches depth. This wetland complex is a depressional system with no apparent inlet or outlet; there is hydrologic connection to any creek. Vegetation in the PSS portion is dominated by Douglas spirea, with some willow and reed canarygrass present. Within the PEM community, Cattail dominates vegetation in the PEM community, but some creeping buttercup, soft rush, foxtail, and a few Sitka willow sprigs are also present. The PFO community is dominated by mature paper birch (*Betula papyrifera*) and red alder.

Approximately 200 feet east of Tower 2/4 is another unnamed creek, which flows northwest across the ROW until it joins a larger creek that enters from the east. This larger creek flows westward within the northern part of the ROW for approximately 300 feet before its confluence with the smaller unnamed creek. The larger creek and the portion of this creek below the confluence is situated within a 10-foot deep gully that has relatively steep banks. The smaller creek has silt substrate whereas the larger creek and the section below the confluence have silt, sand, and gravel substrate. - The channel for the larger creek is situated on a 2 to 3% grade and confined within a 30-foot wide V-notch that appears to have been artificially deepened and straightened. At the time of investigation, flow in the smaller creek was approximately 0.15 cfs whereas flow in the larger creek was approximately 0.3 cfs. Below the confluence, the creek continues off-site to the northwest for at least 2 more river miles before entering California Creek.

The smaller unnamed creek runs through a shrubby area along the south edge of the ROW that is heavily vegetated by vine maple, red-osier dogwood, Douglas spirea, and Himalayan blackberry. Other species include snowberry, red alder seedlings, evergreen blackberry on the upper banks, and reed canarygrass and bentgrass in the open areas near the channel. It begins south of the ROW in overgrazed fields, and outlets north of the ROW in mature deciduous forest. The banks of the larger creek are heavily vegetated with Douglas spirea.

Wetland P is a possible wetland that is approximately 200 feet in length and located 30 feet east of Tower 2/5. It is situated on a north-facing slope and occurs within a narrow, shallow ditch that extends across only the northern portion of the ROW. Saturation was present near the soil surface during the investigation. This possible PEM wetland is dominated by reed canarygrass and tall fescue.

Mile 3

Mile 3 of the transmission line extends from a tower west of Valley View Road to a tower west of Yukon Road (private road) (see Figures 2-E through 2-G). Within the Mile 3 study area there are five towers (3/1 through 3/5), no streams, three wetlands, and one possible wetland area.

Wetland Q is approximately 50 feet in length and is located 100 feet west of Valley View Road. It is situated on a bench on a north-facing slope (approximately 2.5 percent grade) and contained 1 inch of standing water. A driveway ditch leads down the slope near the wetland. This PEM wetland is dominated by reed canarygrass, tall fescue, and bentgrass, with some velvetgrass and clover present.

Wetland R is a possible wetland that is approximately 60 feet in length and located adjacent to Tower 3/2. It receives drainage from an uphill slopes to the east and west along with precipitation, seeping to an upland meadow to the north. This possible PEM wetland is dominated by reed canarygrass and tall fescue, with some bentgrass and cut spirea present.

Wetland S is approximately 500 feet in length and occurs on both sides of Tower 3/4, including an upland lobe (175 feet in length) in the eastern portion. Patches of standing water up to 2 inches deep were present during investigation. The wetland is situated on a gentle south-facing slope. This PEM wetland is dominated by soft rush and bentgrass, with some foxtail present.

Wetland T is approximately 30 feet in length and is approximately 200 feet west of Yukon Road. This PEM wetland is situated in a constricted gully approximately 12 wide at its narrowest point. The wetland is a situated in a depression and flows south during high flows to a driveway ditch that is within the ROW. It is dominated by reed canarygrass and soft rush, bordered by Himalayan blackberry on the gully banks.

Mile 4

Mile 4 of the transmission line extends from a tower west of Yukon Road to a tower east of Kickerville Road (see Figures 2-G through 2-I). Within the Mile 4 study area there are five towers (4/1 through 4/5), two streams, seven wetlands, and one possible wetland areas.

Wetland U is approximately 125 feet in length and is located on the west side of Tower 3/5. It is situated on a 1 percent southwest-facing slope and contained standing water up to 2 inches in small depressions during the investigation. This PEM wetland is dominated by reed canarygrass, bentgrass, and soft rush, with some creeping buttercup present. It also contains red alder saplings and some Douglas spirea in the southern portion.

Wetland V is approximately 375 feet in length and is located on the east side of Tower 4/1. It is situated on a 5 percent slope and drains slowly to the north and northeast. This PEM wetland is dominated by reed canarygrass, soft rush, and tall fescue, with some red alder saplings present.

Wetland W is approximately 375 feet in length and is located east of Tower 4/2. The wetland is situated on a south-facing slope, receiving water from the north. It drains to the south into a large, artificially created pond located outside of the ROW and within Fingalson Creek. This PEM wetland is dominated by bentgrass, reed canarygrass, soft rush, with some tall fescue, Douglas spirea, and red alder near the edges.

Wetland X is approximately 40 feet in length and is located on both sides of Tower 4/2. It contained standing water up to 2 inches deep and is situated on a southwest-facing slope. This possible PEM wetland is dominated by bentrgrass and reed canarygrass, with some soft rush present.

Wetland Y is approximately 600 feet in length and is located between Towers 4/2 and 4/3. Wetland Y is adjacent to a portion of Fingalson Creek and likely influenced both by the stream through groundwater seepage and surface water flooding. This PEM wetland is dominated by reed canarygrass and Himalayan blackberry, with some willow and Douglas spirea present. The eastern portion of the wetland is dominated by cattail and reed canarygrass.

An approximately 500-foot long section of Fingalson Creek occurs within the southern part of the ROW between Towers 4/2 and 4/3. The creek then meanders south of the ROW before crossing the ROW completely just east of Tower 4/4 and continuing off-site to the north. The stream channel is 6 to 10 feet wide with a substrate of sand and silt. The stream is confined within moderately broad gully with fairly steep side-slopes to 40 feet above the creek bed. Flow in this portion of the creek was less than 0.25 cfs during the investigation Fingalson Creek is drains into Terrell Creek less than 300 feet after crossing the ROW.

Within the ROW, the creek meanders for approximately 1000 feet through dense Himalayan blackberry thickets with some red alder saplings. A small patch of native shrubs is present in the eastern portion of the creek within the ROW. Willow, red-osier dogwood, and salmonberry are present along with small amounts of reed canarygrass and cattail. Outside of the ROW, the associated riparian area of Fingalson Creek is intact and dominated by mature red alder with vine maple in the understory.

Wetland Z is a possible wetland approximately 150 feet in length and is located on both sides of Tower 4/3. Topography in this area is variable with knolls and low spots. Standing water up to 2 inches was present over a 70 square foot area. Surface and ground water from this possible wetland drains southeast toward Fingalson Creek. Vegetation within this community is dominated by reed canarygrass, with some Himalayan blackberry, Douglas spirea, red-osier dogwood, and willow. Neighboring areas within the ROW appear to be a wetland mosaic on rolling topography.

Terrell Creek also flows north across the transmission line ROW east of Kickerville Road and a small residential area (between Towers 4/4 and 4/5). The riparian area associated with Terrell Creek outside of the ROW is the similar to Fingalson Creek. Within the ROW, the creek flows through a somewhat narrow, deep gully with banks that are densely covered with Himalayan blackberry. The gravel substrate of this portion of the creek is relatively clean and free of sedimentation, but the water level is low in comparison to portions outside of the ROW. The channel is moderately confined to 4 feet wide and flow at the time of investigation was over 10 cfs at the time of the investigation.

Wetland AA is approximately 40 feet in length and is located east of a gravel driveway and west of Terrell Creek. This depressional wetland receives water from surrounding uplands and precipitation and had inundation up to 2 inches in depth during the investigation. This small PEM wetland is dominated by bentgrass, with some soft rush and reed canarygrass.

Wetland BB is approximately 300 feet in length and is located east of Kickerville Road. This wetland is primarily located within a narrow swale that parallels a gravel driveway extending east of Kickerville Road. Wetland BB receives drainage from an artificially created small pond/wetland just north of the ROW and drains north to the ditch along the east side of Kickerville Road. Much of the wetland supported approximately 2 inches of slowly flowing water during the investigation. Vegetation in the portion of this PEM wetland within the ROW is dominated by soft rush and reed canarygrass and contains standing water throughout most of the swale.

Mile 5

Mile 5 of the transmission line extends from a tower west of Kickerville Road south to a tower north of Brown Road (see Figures 2-I and 2-J). Within the Mile 5 study area there are three towers (5/1 through 5/3), no streams, six wetlands, and no possible wetland areas.

Wetland CC is approximately 180 feet in length and is located west of Kickerville Road. This wetland is situated on a subtle bench within a gentle west-facing slope and contains a circular area of standing water 3 to 4 inches deep. Most of the wetland is dominate by bentgrass, but the standing water area is dominated by foxtail.

Wetland DD is approximately 600 feet in length and is located just south and east of Tower 5/1. The wetland is situated on a gentle west to northwest-facing slope with some standing water present up to 3 inches in depth. Vegetation in this PEM wetland is dominated by bentgrass, tall fescue, and velvetgrass.

Wetland EE is approximately 60 feet in length and is located north of Grandview Road. Some patches of standing water 2 inches deep were present near the center of the ROW. Wetland EE is situated on a slight west-facing slope and extends outside of the ROW. This PEM wetland is dominated by meadow fescue (*Festuca pratensis*) and foxtail.

Wetland FF is approximately 300 feet in length and is mostly in the east half of the ROW between Tower 5/2 and Grandview Road. Patches of standing water up to 3 inches deep are present in small, depressed areas. Wetland FF drains north to ditch along south edge of Grandview Road, but no outflow was observed during the investigation. This PEM wetland dominated by reed canarygrass and contains some tall fescue.

Wetland GG is approximately 60 feet in length and is located 150 feet north of Tower 5/3. A shallow ditched swale extending northeast is present in the wetland. The swale supported trickle flow (<0.01 cfs) during the investigation that traveled off-site to the east and leads north to narrow swale that leads west across the corridor. This PEM wetland is dominated by bentgrass, soft rush and tall fescue.

Wetland HH is approximately 850 feet in length and extends from the north edge of Brown Road to Tower 5/3. It is situated on a gentle west-facing slope (less than 2 percent grade) and connects to a large deciduous forest wetland to the west. This PEM wetland is dominated by bentgrass, tall fescue, and clover, with some soft rush present.

3.1.4 Threatened and Endangered Species

A list of threatened or endangered species of plants and animals and priority habitats have been identified by the USFWS (2002), National Marine Fisheries Service, NHP, and the Washington Department of Fish and Wildlife (WDFW) for the project vicinity.

A query on the NHP database indicated that there are no known rare, threatened or endangered species of plant or high quality ecosystems within the study area. Priority Habitats identified by the WDFW include wetlands scattered throughout the study area. According to the USFWS, two federally listed species may occur within the project vicinity: bull trout and bald eagle.

Bull trout do not utilize the area and would not be affected activities under consideration for this project. However, at least one bald eagle nest occurs within 0.25 mile of the study area.

A bald eagle and possible nest were observed during field investigation, near Towers 4/2 and 4/1. The eagle was perched near the top of a mature cottonwood approximately 130 feet tall. A large nest is present in the main crook of the cottonwood, approximately 80 feet above ground. The possible nest tree is within upland forest, approximately 300 feet north of the edge of the ROW, and within 0.25 mile of Towers 3/5, 4/1, 4/2, and 4/3. The eagle was first seen perched in the nest tree around 12:00 pm during one day of the field investigation, then flew southeast. At 2:15 pm, it was again observed perching in the same tree, above the nest.

The behavior and timing of the bald eagle observation suggest the possibility that nesting activities may be occurring at the observed nest. Bald eagles in Washington typically begin courtship behavior in January and February and begin egg incubation in March or April (Stinson et al. 2001; Rodrick and Milner, 1991). Another field visit in late March or April could better determine if the nest is active.

Neither the nest nor any other area near the project area is known to be traditional wintering grounds for bald eagles (Stinson et al., 2001). Bald eagles typically arrive at wintering areas in late October and leave by February (Rodrick and Milner, 1991). Because wintering grounds are typically near areas where food during this time is abundant and disturbance is minimal, it is not likely that a wintering area exists within or near the project area.

3.1.5 Other Wildlife

The study area surroundings provide habitat for a limited number of species. Most wildlife observed during field investigation was found outside of ROW within intact riparian areas, forests, and fields. The expansive fields dominated by overgrown pasture grasses provides habitat for mice and voles, which attract red-tail hawks, great blue herons, and coyotes. Some native grassland birds, such as song sparrow, fox sparrow, and common snipe, and one game bird species (ring-necked pheasant) regularly stocked here by WDFW, also inhabit the fields. The forested areas in the vicinity provide cover for several species that primarily utilize the fields for foraging. These species include coyote, mule deer, red-tail hawk, American robin, and others. Most migratory and resident bird species that likely breed within or near the ROW, such as northern flicker, house finch, common yellowthroat, chickadee, song sparrow, kinglet, and spotted towhee, utilize the shrubby and forested areas for cover and foraging.

A red-tailed hawk nest was observed between Towers 2/1 and 1/6, west of Elk Road. The nest is in a mature red alder tree, located approximately 600 feet south of the ROW. The property owner of adjacent properties noted that the nest has been used by red-tailed hawks for the previous twelve years. No red-tailed hawks were observed near the nest during field investigations.

3.2 CULTURAL RESOURCES

3.2.1 Background

Pre-history

Archaeologists began investigating the prehistory of the Northwest Coast in the 1870s, resulting in the compilation of substantial amounts of data (Carlson 1990:107). Two sequences of prehistoric development are recognized within the Puget Sound region, the littoral and riverine sequences (Nelson 1990). These sequences are closely tied to the environments for which they have been developed and represent aboriginal adaptations to these specific conditions. Specifically, the littoral sequence refers to cultural adaptations to coastal or seashore environments, while the riverine sequence applies to inland, river-based settings.

Most of the sites that have been excavated within littoral areas have consisted of midden deposits marked by molluscan shell and fragments of mammalian and avian bone. These sites generally contain low quantities of tools, and tools that do exist are often stylistically quite variable. Because of the paucity of artifacts suitable for development of temporally sensitive typologies, archaeologists have often relied upon changes in the midden constituents to interpret prehistory in the littoral zones of Puget Sound (Nelson 1990).

Early investigations leading to development of the littoral sequence primarily took place at the Skagit River delta and adjacent islands (Bryan 1957, 1963; Kidd 1964, 1966; Mattson 1971 and Thompson 1978). The earliest identified assemblages are believed to date to the period between 2000 - 500 B.C. These remains suggest an adaptation focused upon the exploitation of the littoral zone, with the hunting of coastal land animals and the gathering of intertidal resources being of prime importance. This pattern of resource exploitation appears to have remained relatively constant for the next 2,000 years. Although little change is observed within the adaptive strategies of the aboriginal inhabitants of Puget Sound's littoral zone, stylistic change has been identified within local technologies. Intermediate, Late, and Protohistoric, as well as the previously mentioned Early, components have been identified. Scallop, dentalium, and olivella shells, jade adzes, and graphite are common components of Late period assemblages, while exotic aboriginal trade goods and items of European manufacture mark the Protohistoric period (Nelson 1990).

The riverine sequence, appropriate for more inland settings, is based primarily on assemblages from sites located in the Snohomish, Sammamish, and Snoqualmie river valleys. Unfortunately it is still poorly understood and is based almost entirely on changes in artifact forms. Few data are available pertinent to subsistence activities, and it cannot be correlated in detail with the littoral sequence (Nelson 1990:483).

The earliest assemblages, known as the Olcott complex, are marked by cobble tools and leaf-shaped projectile points and are similar to materials from the Fraser River valley dating from 8000 to 4000 B.C. In the Puget Sound basin, evidence suggests that the Olcott complex may have persisted until 2000 B.C. (Nelson 1990:482-483).

Following the Olcott complex is a regional variant of the Plateau-wide Cascade phase marked by Cascade and Cold Springs Side-notched series projectile points, types that spread throughout the Columbia Plateau between 4500 and 2000 B.C. West of the Cascades, it appears likely that these forms arrived no earlier than 1800 B.C. These point types were eventually replaced by a number of projectile point types similar to the Frenchman Springs phase of the Plateau, suggesting the presence of a poorly documented phase of Northwest Coast prehistory dating between about 1000 and 200 B.C. (Nelson 1990:482).

The subsequent phase, characterized by a single site on the Snoqualmie River, is marked by a variety of point styles similar to those from the Quilomene Bar phase of the western Columbia Plateau, dating to the first millennium B.C. The site assemblage includes a rich lithic industry dominated by large side-notched points, end and side scrapers, cobble tools, microblades, twined basketry, fishhooks, and net weights (Nelson 1990:483).

The final and most recent phase in the riverine sequence, best illustrated by a site near Snoqualmie Falls, appears to represent a continuity in local traditions. Small flaked stone tools present in the site collection are identical to those of the Cayuse phase of the western Columbia Plateau (Nelson 1990:483).

Ethnography

The current project area is located within the region of North America referred to by ethnographers as the Northwest Coast culture area. This area is comprised of the coastal strand located between the redwood forests of northern California and Prince William Sound, Alaska. The aboriginal peoples who inhabited this environmentally rich area shared many cultural traits, including an adaptation focused upon the utilization of marine resources, well-developed class systems, complex concepts of wealth, and the extensive use of wood for items of material culture (Spencer et al. 1977: 114-162).

The ethnographic inhabitants of the project area were the Lummi, speakers of the Straits Salish division of the Central Coast Salish language family. The Lummi oriented their subsistence activities toward the Gulf of Georgia and the San Juan Islands. Like most other groups in the area, Lummi subsistence practices centered on the taking of marine resources, although terrestrial resources were also heavily utilized. The most important resource was salmon, all five species of which (sockeye, chinook, coho, pink, and chum) seasonally occurred within their territory. Salmon were primarily captured using reef nets, although trapping, harpooning, and gaffing were also employed. Halibut, sturgeon, bottomfish, and numerous shellfish species were also harvested. Terrestrial resources were also relied upon, including such plant resources as fern roots, wild carrot, camas, wild onion, nuts, and berries. Seals, otters, sea mammals, waterfowl, and terrestrial game animals were also hunted (Reid 1999: 17; Suttles 1990: 453-459).

Yearly subsistence cycles were primarily focused on winter villages, used intensively from November through February. Lummi villages were located near coastal fishing sites, river mouths, and prairies, reflecting the relationship between settlements and resource procurement locations. Ethnographic records report three village locations and a number of seasonal sites along Birch Bay. The three village locations include the present community of Birch Bay (45WH11), a site near the present mouth of Terrell Creek (45WH67), and a site to the south near the old mouth of the creek (45WH09). Spring, summer and fall were spent traveling to a variety of environments to harvest a wide range of resources (Reid 1999: 17; Suttles 1990: 453-459).

Villages were always on water and usually placed where canoes could be easily beached. Villages could consist of a single house, a row of houses, or several rows of houses. In the early nineteenth century, the most common form of dwelling was a shed-roofed structure with a permanent post-and-beam framework and a removable cover of roof and wall planks. Houses were usually built parallel to the shoreline, sloping to the rear, and measured from 20 to 60 feet in width and twice or more in length. Other structures included summer mat houses, cedar bark huts, wooden grave houses, and sweat lodges of mats and poles (Suttles 1990:462).

The Central Coast Salish, like all the inhabitants of the Northwest Coast culture area, made extensive use of the dense forests found throughout the region. Trees were felled and often split with wedges to produce lumber for their houses or hollowed out for canoes. Smaller items produced from wood include boxes, bowls, and spoons, while cedar bark and other plant materials were used for clothing and other items of material culture. Stone, shell, deerskin, and other materials were also put to many uses.

History

The first non-native group known to enter the Puget Sound area was a British expedition under the command of George Vancouver in 1792. Peter Puget, from whom the area derives its name, was one member of this expedition. Members of Vancouver's expedition named Birch Bay after the black birch and poplars in the area. They apparently went ashore on the southern side of the bay near an "overgrown" village and set up an observatory on the southern portion of the Terrell Creek spit, land now occupied by Birch Bay State Park. The party remained camped in the area from June 11-15, 1792 (Reid 1999: 18). Indirect contact, however, appears to have reached local inhabitants prior to Vancouver's visit. Many of the aboriginal inhabitants of the greater Puget Sound area had already obtained European goods through long distance trade, and furthermore, the Southern Coast Salish showed evidence of having experienced a smallpox epidemic. Following Vancouver's expedition, little direct contact occurred for the next three decades. This is primarily due to the fact that otters were relatively scarce in the general vicinity and maritime fur traders had no other reason for entering the area (Cole and Darling 1990; Suttles and Lane 1990).

In 1818, an agreement was signed between the United States and Great Britain giving both parties rights to the Oregon Country, of which Puget Sound was a part. This agreement for the joint occupation of the region was renewed in 1827 (Marino 1990). Shortly following the initial agreement, a permanent Euroamerican presence in the area was established.

In 1824, a Hudson's Bay Company party reportedly stopped at Birch Bay (Reid 1999:18). Three years later, in 1827, Fort Langley was established on the Fraser River and in 1833 the Company founded Fort Nisqually on the Nisqually River. Some Puget Sound peoples may have been trading at Hudson's Bay Company outposts on the Columbia River earlier, but in 1827 there were certainly Snohomish, Skagit, and others trading on the Fraser. The establishment of Fort Nisqually, however, began continuous contact within the region. Not long after the traders established their presence within the Puget Sound area, various Christian missionaries arrived. In 1839, 1840, and 1841, Catholic missionaries Fathers Norbert Blanchet and Modeste Demers traveled through the region spreading their religious doctrines to native groups throughout the area (Hajda 1990; Suttles and Lane 1990).

In 1846, the United States and Great Britain signed a treaty that split the Oregon Country. The Treaty of Washington drew the international boundary line at 49 degrees north latitude with a zigzag through the Strait of Juan de Fuca. Britain took sole possession of the lands located north of the demarcation, while the United States took the lands to the south. The Puget Sound area was henceforth a United States possession, becoming part of Oregon Territory in 1848 and of Washington Territory in 1853 (Marino 1990; Suttles and Lane 1990).

Although Euroamericans had settled within Puget Sound as early as 1845, it was following the establishment of the territories that the area witnessed a great influx of settlers. Congress enacted the Donation Land Act of 1850 that provided opportunities for settlers to acquire homesteads, and the exploitation of the region's natural resources soon became a major force behind the influx of settlers into the region. Settlement was aided by the eventual construction of wagon roads into the Puget Basin area in the 1850s; previously, emigrants were forced to travel the more common trails to California or Oregon, and then proceed north, often by ship. In 1858, the Whatcom Trail was completed, which ran from the town of Bellingham through Sumas, on the Canadian border, to the gold fields of the Fraser River. This road helped to further open up the area to settlement (Avery 1965:175-176; Winther 1950:130-132).

As the century progressed, the industries developed for which this region is famous, including timber and commercial fishing. Development of these industries was aided by the arrival of the railroad. In 1883, the Columbia River branch of the Northern Pacific Railroad was completed to Tacoma; four years later, the main line of the Northern Pacific across the Cascades to Tacoma was finished. By the early 1890s, the area was linked to Seattle by the Seattle, Lakeshore, and Eastern Railroad, later absorbed by the Northern Pacific Railroad. Eventually, the Milwaukee Road and the Burlington Northern Railroads would also serve the area. The railroads also ensured that the population of the area would continue to grow to a point where a state government could be supported, and in 1889, the state of Washington was admitted to the union (Avery 1965:201-202).

By the turn of the century, the Puget Sound basin was well upon its way to being the urban center of the northwestern United States (Marino 1990; Suttles and Lane 1990). Basic industries such as lumbering, fishing, and farming continued to prosper, but the presence of excellent harbors in the Sound encouraged the growth of major manufacturing centers. During the course of this growth, the Sound was also identified as a strategic location for the U.S. Navy, resulting in the development of a number of naval facilities. Smaller rural communities throughout the region in part supported the industrial and military centers. With the continued urbanization of the Puget Sound region, however, these towns have become part of a largely continuous suburban environment.

3.2.2 Results of Field Investigation

No cultural materials were identified during the course of inventory or subsurface probing activities. Although ground surface visibility was poor in many areas of the corridor, examination of areas of improved visibility, combined with subsurface probing, indicate that the likely presence of resources along the corridor is low. While archaeological resources have been identified in the general project vicinity, a majority of these consist of shell middens along the shoreline of Birch Bay and other nearby coastal areas. Other nearby sites include small, sparse scatters of lithe materials and fire-affected rock. No materials of this nature were identified along the corridor.

No historic or archaeological resources were identified within the project corridor. Although visibility was limited in many areas, given the nature of the environment along much of this route, and the distance from the coastline where cultural resources in this area are concentrated, the presence of unidentified archaeological deposits seems low. This is supported by the results of subsurface probing, which did not produce any evidence of buried resources. In the unlikely event that buried cultural materials are encountered during construction related activities, however, all ground-disturbing activities in the vicinity should cease until a qualified archaeologist can evaluate the find and determine an appropriate course of action.

4.0 IMPACTS AND MITIGATION

If towers need to be relocated within the transmission line segment surveyed, then some impacts to environmental resources may occur. Cultural resources will not likely be impacted by relocating towers or any other activity that may occur within the project area.

The only species considered federally threatened or endangered that may be affected by relocating towers or replacing transmission lines is the bald eagle. A bald eagle nest is present within 300 feet of the ROW, but it has not yet been determined whether the nest is active. In general, construction activity that could disturb nesting activity should not occur within 0.25 to 0.5 miles from an active nest during the nesting season, which is generally considered by USFWS to extend from January 1 to August 15.

Relocating towers within the transmission line ROW may cause impacts to wetlands and streams. However, these impacts could be avoided, minimized, restored (if temporary), or compensated.

Eliminating or filling wetlands typically requires a Section 404 permit from the Corps. Such activities may also require a 401 Water Quality Certification from Ecology and/or a Fill and Grade permit from Whatcom County. Activities directly affecting streams or other channels supporting flowing water (i.e. ditches) may require a Hydraulic Project Approval (HPA) from WDFW.

Impacts to wetlands and wetland buffers associated with the project activity under consideration would be mitigated by applying the standard mitigation sequence as described in the Memorandum of Agreement between EPA and the Department of the Army on Clean Water Act Section 404(b)1 Guidelines. The mitigation sequence would be implemented as follows:

1. **Avoiding impacts.** Impacts to wetlands would be avoided by designing a project that covers relatively few sensitive areas including wetlands, streams, and buffers. Because the transmission line corridor contains several wetland areas, completely avoiding wetland impacts is not feasible. However, impacts to higher quality wetlands within the transmission corridor would be avoided as much as practicable.

2. **Minimizing impacts.** Unavoidable impacts to wetlands and wetland buffers would be minimized by narrowing construction zones within wetlands and wetland buffers as much as is practicable. In addition, Best Management Practices would be used during construction to minimize erosion and prevent the discharge of fill material in wetlands and streams.

3. **Rectifying (Restoring) impacts.** Any unintentional, unauthorized impacts to sensitive areas that may occur during construction would be repaired and rehabilitated as appropriate. Temporarily disturbed areas can be reverted to pre-construction conditions if impacts are not very extensive. Vegetation will be

restored to its former condition or replaced with appropriate native vegetation if the vegetation removed is non-native.

4. **Compensating impacts.** Unavoidable impacts to wetlands would be compensated by enhancing on-site wetland areas that would not be directly impacted by the proposed construction. The Corps normally recommends compensating for permanent wetland impacts at a minimum ratio of 3:1 when using wetland enhancement as the means for compensation. According to Ecology's guidelines (Ecology 1998), impacts to Category III PEM wetlands should be compensated at a 4:1 ratio when using enhancement. An appropriate level of enhancement will occur within each sub-basin where impacts occur. Impacts that occur within the California Creek sub-basin will likely be compensated by enhancing Wetland A, which is the large wetland adjacent to the Custer Substation. Impacts that occur within the Terrell Creek sub-basin may be compensated in degraded wetland area(s) that have a high potential for successful, sustainable enhancement.

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