REVISED PROJECT INFORMATION DOCUMENT

Gateway Pacific Terminal

Whatcom County, Washington

Pacific International Terminals, Inc.
1131 SW Klickitat Way
Seattle, Washington 98134

March 2012

ACRONYMS AND ABBREVIATIONS

AREMA	American Railway Engineering and Maintenance-of-Way Association
B&O	Business & Occupation
bgs	Below ground surface
BMP	Best management practices
CEQ	Council on Environmental Quality
CIF	Cost, insurance, and freight
cm	centimeter
CPID	Cherry Point Industrial District
dB	Decibel
DPS	Distinct population segment
dwt	Dead weight tons
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ft/sec	feet per second
g	gravity
I-5	Interstate 5
JARPA	Joint Aquatic Resources Permit Application
kg	Kilogram
LII	Light Impact Industrial
MAP	Multi-agency permitting
MBTA	Migratory Bird Treaty Act
MDP	Major Development Permit
MHHW	Mean higher high water
MLLW	Mean lower low water
MPP	Major Project Permit
Mtpa	Million metric tons per annum
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
ORA	Governor's Office of Regulatory Assistance
PHS	Priority Habitats and Species
PUD	Public Utility District
RCW	Revised Code of Washington
RIMS	Regional Input-Output Modeling System
SEPA	State Environmental Policy Act
SOK	spawn-on-kelp
SPCC	Spill prevention, control, and countermeasures
SR	State Route
SSDP	Shoreline Substantial Development Permit
SWPPP	stormwater pollution prevention plan
Terminal	Gateway Pacific Terminal
UGA	Urban growth area
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VAT	Value added taxes
VTA	Vessel Traffic Analysis
WCC	Whatcom County Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources

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CHAPTER 1 INTRODUCTION

Pacific International Terminals, Inc. (Pacific International Terminals), a subsidiary of SSA Marine, is proposing to develop the Gateway Pacific Terminal (the "Terminal") at Cherry Point in Whatcom County, Washington (Figure 1-1). Designed for export and import of dry bulk commodities, the proposed Terminal would include a deep-draft wharf with access trestle, dry bulk materials handling and storage facilities, and rail transportation access. This Revised Project Information Document describes the proposed project, the permits and approvals required to construct and operate the project, the environmental conditions of the project area, and the effects of the proposed project.

The proposed project would meet three principal needs, each of which provides a basis for the proposed project:

1. The need to ship bulk commodities to and from international markets to meet current and future market demand;
2. The need for a multimodal deep-water bulk marine terminal in the Puget Sound region; and
3. The need for community and economic development.

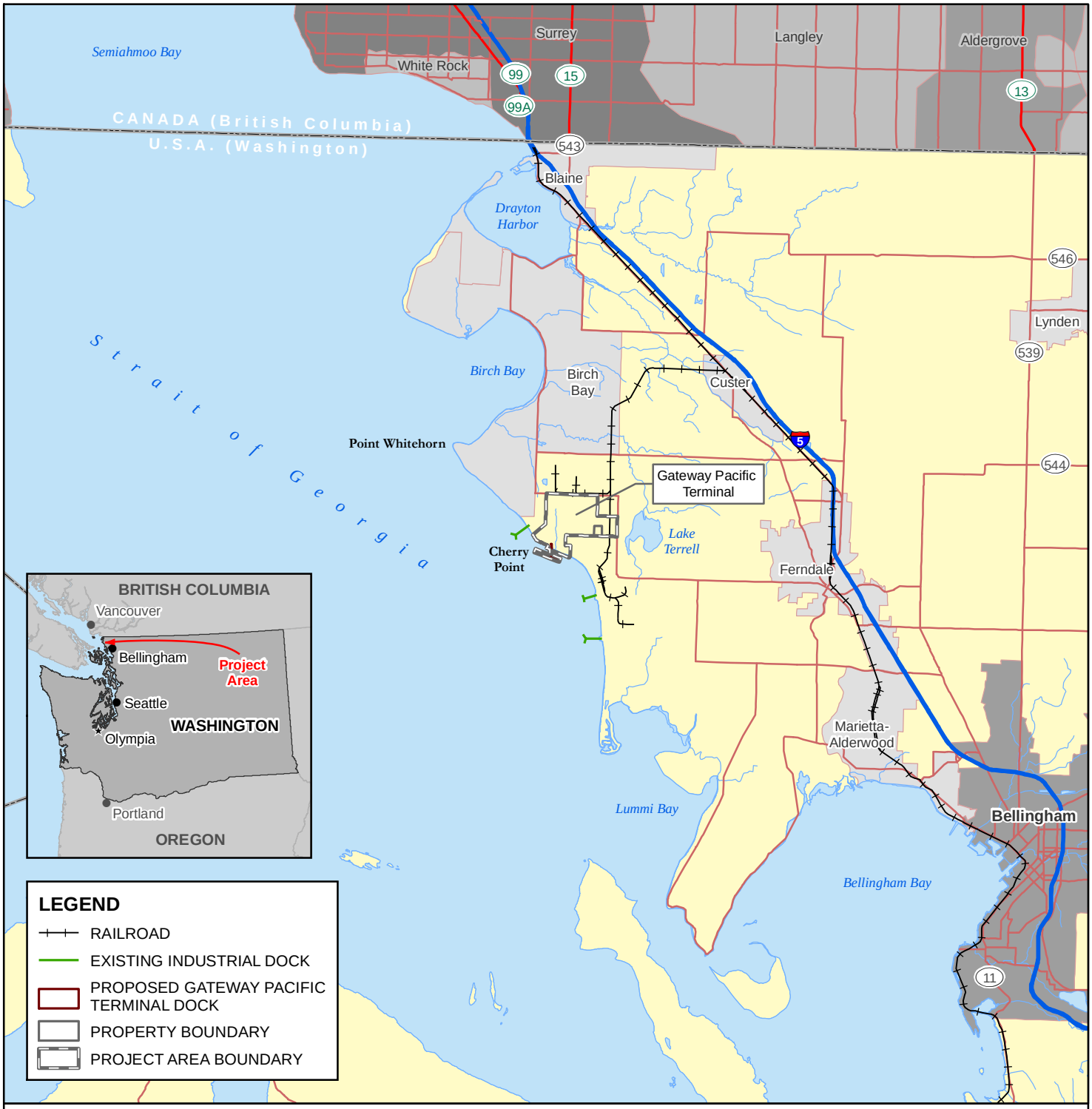
Activities associated with development of the proposed Terminal started in the late 1980s and have included completion of numerous environmental assessments and the issuance of land-use and shoreline permits by Whatcom County. The environmental permitting process for the Terminal is currently being coordinated through a collaborative, multi-agency permitting team (MAP Team) led and administered by the State of Washington Governor's Office of Regulatory Assistance (ORA). The permitting process will include a detailed environmental review of the proposed project under the National Environmental Policy Act (NEPA) and Washington State Environmental Policy Act (SEPA).

1.1 PURPOSE OF THE REVISED PROJECT INFORMATION DOCUMENT

The purpose of this Revised Project Information Document is to provide the public, the MAP Team, decision-makers, and other stakeholders, including affected Native American Tribes, with a detailed description of the proposed project, the potential environmental effects of the project, and measures incorporated into the proposed project to reduce such effects. It discusses the purpose of the project in the context of international trade and the need for the project to provide dry bulk terminal capacity in the Pacific Northwest. The Revised Project Information Document provides a succinct compendium of project scope, construction, operation, and environmental information that is not found in specific discipline reports to support the various permitting and environmental reviews. Pacific International Terminals has incorporated the proposed design measures identified in this Revised Project Information Document into its applications for permits and other approvals. The contents of the Revised Project Information Document may also serve as a useful resource in the completion of

required environmental reviews by the MAP Team, including the Environmental Impact Statement (EIS) to be prepared pursuant to NEPA and SEPA.

The Revised Project Information Document includes the most current information available; Pacific International Terminals is continuing to conduct additional engineering, design work, and environmental and other studies in support of the project. When the environmental studies are complete, amendments or addenda to this Revised Project Information Document will be issued to supplement the information presented here.



		Pacific International Terminals	CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.
PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL		DWN BY: SD	DATUM: NAD83 / DATE: MARCH 2012
TITLE: VICINITY MAP		CHK'D BY: KD	REV. NO.: 1 / PROJECT NO.: 091515338C-18-01
		PROJECTION: WA SP North, Ft.	SCALE: 1 inch=3 miles / FIGURE No.: FIGURE 1-1

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 1-1 - Vicinity Map.mxd

1.2 PROJECT OVERVIEW AND KEY FEATURES

Gateway Pacific Terminal would serve as a deep water, multimodal terminal for the export and import of dry bulk commodities[1] between rail and oceangoing vessels. The proposed Terminal project area encompasses approximately 1,200 acres. The proposed Terminal's infrastructure would be developed on 334 acres within the total 1,200-acre project area (Figure 1-2). The project area is located in the Cherry Point Industrial Urban Growth Area (UGA), which is zoned for heavy-impact industrial land use. Under Whatcom County's Shoreline Management Program, the property is designated as part of the Cherry Point Management Area, where port and water-dependent industrial facilities are permitted. Whatcom County previously issued a Shoreline Substantial Development Permit and a Major Development Permit to Pacific International Terminals authorizing the construction and operation of the Terminal. Additional details about land use, zoning issues, and the status of permitting for the project are presented in Sections 2.1 and 5.8.

The proposed $665 million Terminal project responds to existing market needs and advances important federal, state, and local governmental objectives, including:

- Growth in global demand for dry bulk commodities;
- Whatcom County's interest in the further industrial development of the Cherry Point Industrial UGA; and
- Continuing economic development initiatives undertaken by both the federal government and the State of Washington that seek to expand exports from Washington to rapidly developing foreign markets in Asia and elsewhere.

The Terminal would enhance the economy of Northwestern Washington by:

- Supporting approximately 21.7 million person hours of construction-related employment, which would generate approximately $411 million in wages, approximately $624 million in local purchases, and approximately $70.8 million in state and local tax revenues during the construction period of the Terminal (Martin Associates 2011);
- Continuing development of the Cherry Point Industrial UGA;

[1] Dry bulk commodities include forest, agricultural, or mining products that are particulate in nature; are minimally processed, if at all; and are not bagged or wrapped. Dry bulk commodities are mainly transported as shiploads or trainloads, and handled using large-capacity containers or storage pads and dedicated transfer machinery generally incorporating conveyor systems. Dry bulk commodities include, for example, grain, iron ore, salts, coal, and alumina. Bulk commodities are the "raw material" upon which many industrial processes depend.

- Sustaining approximately 1,230 jobs in the regional economy, including approximately 430 permanent, family-wage jobs at the Terminal and in the rail and shipping industry during operation of the Terminal;
- Generating approximately $11 million in annual state and local tax revenues;
- Generating approximately $17 million in local purchases by businesses that support the Terminal;
- Generating approximately $126 million in regional economic activities through payrolls and purchase of goods and services; and
- Generating approximately $1.4 billion in revenue for businesses providing handling, vessel, and other services to the Terminal.

The proposed Terminal would include the following key facilities:

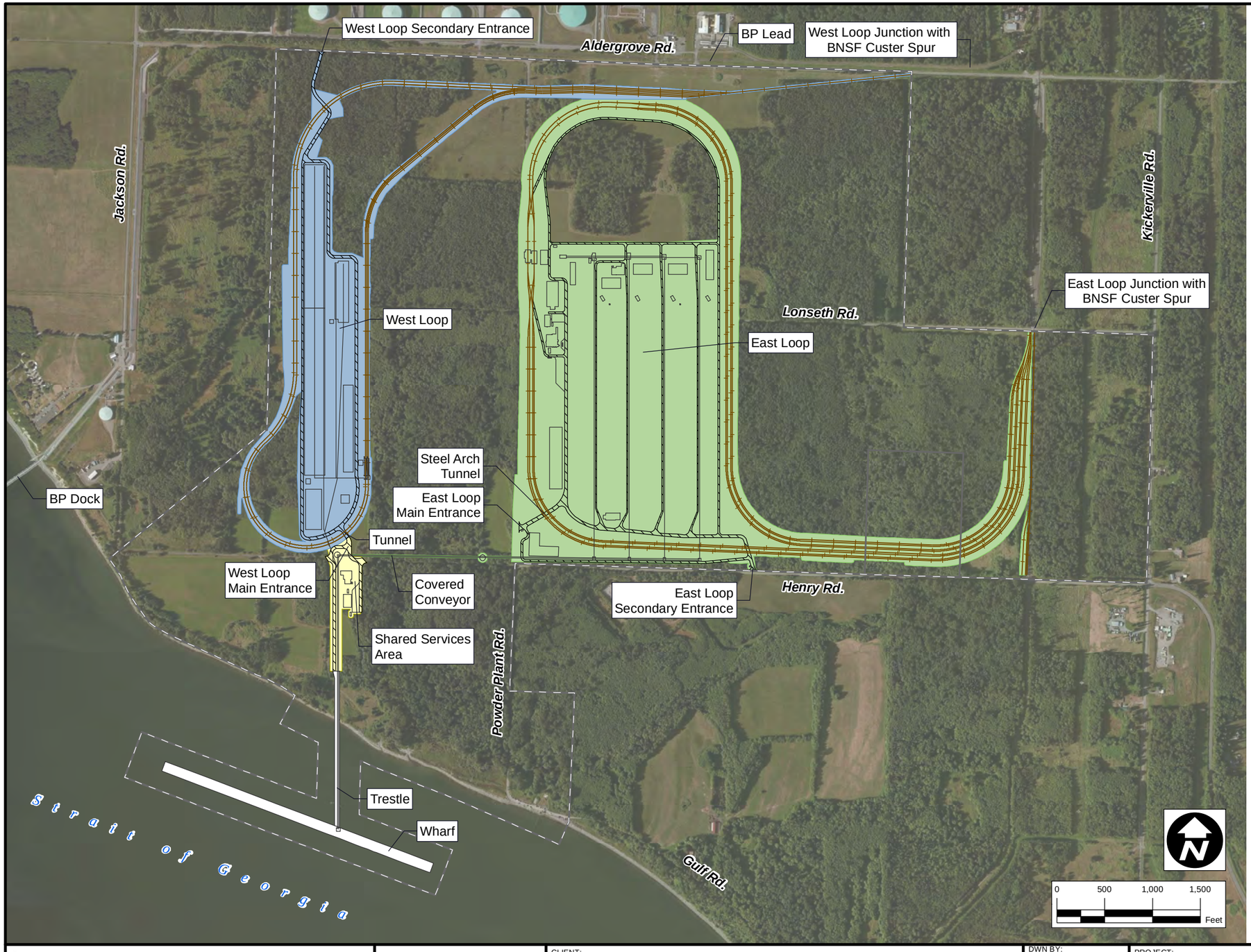
- Wharf and Trestle – The proposed Terminal's wharf and trestle would be located in an area where deep water is close to shore allowing the Terminal to accept the largest and most economic dry bulk carriers currently in service. The wharf would include three deep-water berths suitable for calls by Panamax[2] and Capesized[3] bulk carriers. The ability to accommodate large vessels would minimize vessel traffic and maximize the efficiency of Terminal operations.
- Materials Handling and Storage – The Terminal's material handling and storage areas would consist of two areas: one for uncovered commodity storage and the other for covered and silo storage.[4] The storage areas would be serviced by two rail loops and other miscellaneous support facilities, including stormwater systems. Materials unloading, handling, and loading equipment would be installed that best protects the safety of employees and protects the environment during Terminal operations.
- Rail Connection – The project area is served by BNSF Railway Company's (BNSF Railway) Custer Spur Industrial rail line (Custer Spur), which connects to BNSF Railway's main line at Custer, Washington, approximately 6 miles from the project area (Figure 1-1). The Custer Spur provides the Terminal's access to the nationwide rail network.

[2] Panamax vessels are the largest vessels that currently transit the Panama Canal and have capacities of 65,000 to 85,000 long tons dead weight (dwt).
[3] Capesize vessels are defined as a class of bulk carrier with beams (widths) greater than 105.6 feet that cannot transit the Panama Canal because they are too wide, and therefore must travel south around the Cape of Good Hope or Cape Horn. The majority of the present Capesize fleet has capacities between 160,000 and 180,000 dwt (US Maritime Administration 2009c).
[4] Certain dry commodities, such as grain and potash, are ruined with moisture and thus would need to be stored in a covered structure.

The Terminal would be developed to have the capacity to export and import up to 54 million metric tons per annum (Mtpa) of dry bulk commodities. The type and quantity of dry bulk commodities that would be handled at the Terminal will likely change over time and would depend on international market conditions and customer demands. Products to be exported to the international market would include coal, grain products, potash, calcined petroleum coke, and other bulk commodities (Chapter 4). The main features of the proposed Terminal are shown on Figure 1-2. A more detailed description of the proposed Terminal is provided in Chapter 4.

Pacific International Terminals expects to construct the Terminal in two stages. The first stage is planned to commence in 2014 after completion of necessary environmental reviews and issuance of required federal, state, and Whatcom County permits and authorizations. The second stage of construction would commence during the completion of Stage 1 and be completed in 2017. Additional materials handling equipment would be added in subsequent years in response to operational needs.

The Terminal layout and design have evolved from the project design previously permitted for the Gateway Pacific Terminal. The current design reflects changes in international dry bulk commodity demand and vessel size and incorporates changes based on requests from regulatory authorities and ongoing discussions with stakeholders. The proposed design and operational plan for the Terminal reflect a thorough consideration of potential environmental impacts and Tribal concerns. The resulting design includes proposed measures to mitigate these concerns. These proposed measures are included as committed design features of the proposed project. The plan also includes measures required to meet existing regulatory standards regarding environmental protection (Chapters 4 and 5). A summary of these measures is provided as Appendix A.



LEGEND

- NEW RAILWAY TRACK
- ROAD
- TRESTLE & WHARF
- EAST LOOP
- WEST LOOP
- SHARED SERVICES AREA
- PROPERTY AND PROJECT AREA BOUNDARY
- PROJECT AREA BOUNDARY

Source:
Ausenco Sandwell, 143166-A100-WC001-1.dwg (Rev. P1), 12/22/2011.

Pacific International Terminals
A Cemix Enterprise

CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

DWN BY: SD
CHK'D BY: KD
DATUM: NAD83
PROJECTION: WA SP North, Ft.
SCALE: 1 inch = 1,100 feet

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: PROPOSED PROJECT LAYOUT

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: 1
FIGURE NO.: FIGURE 1-2

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 1-2 - Proposed Project Layout.mxd

1.3 PROJECT LOCATION

The project area is located at Cherry Point, a small promontory of land on the eastern shore of the Strait of Georgia on the west coast of Washington State. The project area is located approximately 18 miles northwest of the City of Bellingham, 5 miles west of Ferndale, and 17 miles south of the US-Canada border (Figure 1-1). Existing major industrial facilities in the Cherry Point Industrial UGA include the BP Cherry Point Refinery, the ConocoPhillips Ferndale Refinery, and the ALCOA-Intalco Works; industrial piers currently serve all three facilities.

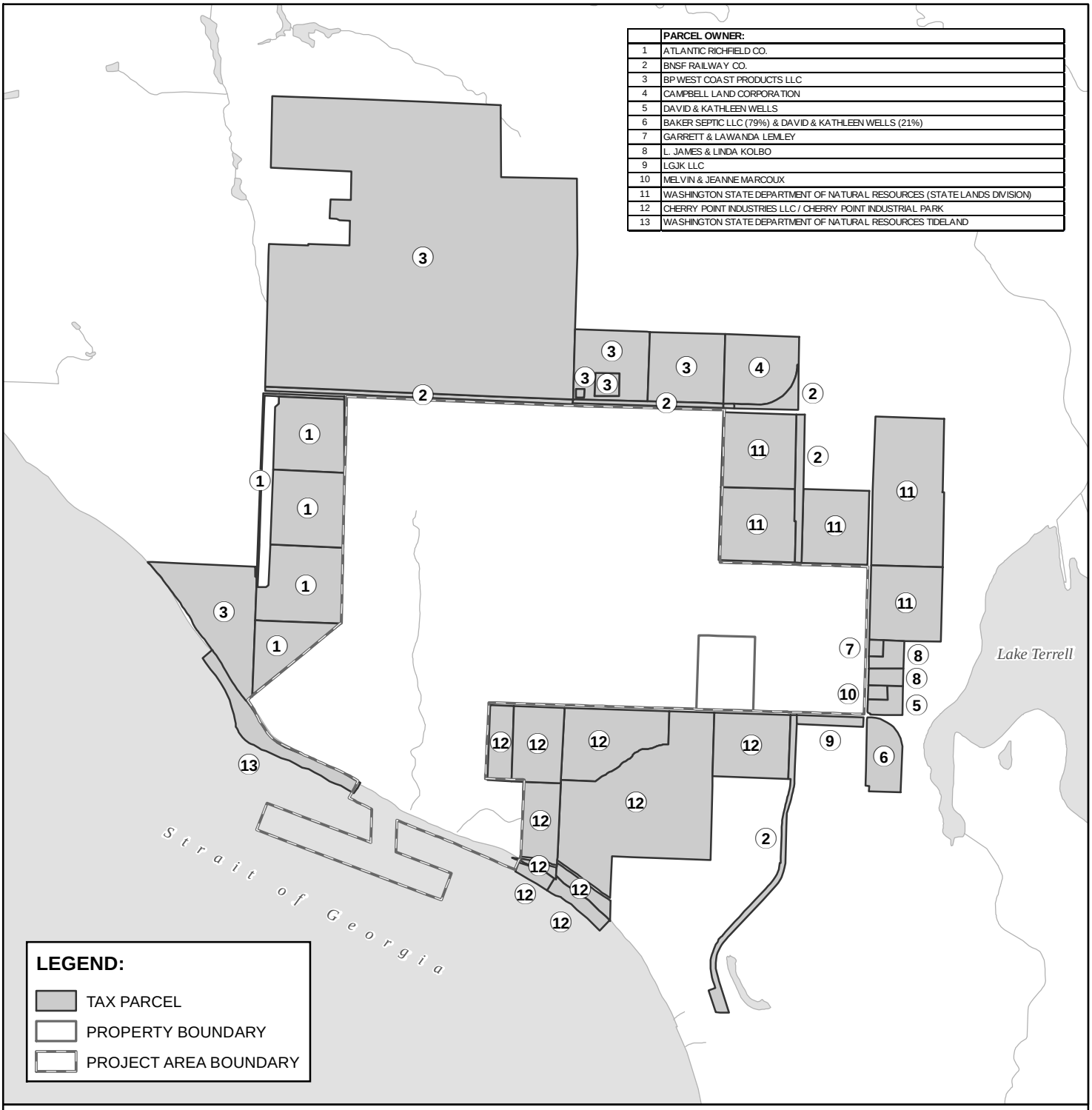
Cherry Point has the following key advantages as a location for development of a dry bulk terminal:

- It has a natural deep-water, nearshore marine location that does not require dredging for development or maintenance of a deep-water wharf.
- Cherry Point's natural deep water enables the proposed wharf to accommodate up to 80-foot average draft vessels, including the largest oceangoing dry bulk cargo vessels, known as Capesize and Panamax vessels.
- It is a naturally protected inland marine water body.
- It has adequate available land zoned as Heavy Impact Industrial and a shoreline designation that supports water-dependent industrial use.
- It has adequate industrial water supply capacity and electrical infrastructure.
- It has easy access to Interstate 5 (I-5) via State Route (SR) 548 (approximately 6 miles).
- It has a ready connection to a Class 1 railroad (BNSF Railway).
- It has an adequate, mainly flat area for short-term storage, transfer, and handling of commodities.
- It has sufficient upland area to process a train approximately 8,500 feet long without interfering with mainline rail traffic.

1.4 PROJECT DEVELOPER AND PROPERTY OWNERSHIP

The Terminal would be built, owned, and operated by Pacific International Terminals, Inc., a wholly owned subsidiary of SSA Marine, Inc., a Carrix Company. Pacific International Terminals is the project applicant for development of the Terminal. BNSF Railway will be the project applicant for improvements to Custer Spur, which would occur only if the Terminal is built.

The upland portions of the Terminal would be built on approximately 334 acres of a 1,200-acre assemblage of private property. The wharf and the major length of the trestle would be located on state-owned tidelands that would be leased from the Washington Department of Natural Resources (WDNR). Pacific International Terminals will petition Whatcom County for vacation of specific County-owned rights-of-way within the project area. Adjacent landowners include BP, WDNR, ALCOA, BNSF Railway, and one other private property owner (Figure 1–3).



	PARCEL OWNER:
1	ATLANTIC RICHFIELD CO.
2	BNSF RAILWAY CO.
3	BP WEST COAST PRODUCTS LLC
4	CAMPBELL LAND CORPORATION
5	DAVID & KATHLEEN WELLS
6	BAKER SEPTIC LLC (79%) & DAVID & KATHLEEN WELLS (21%)
7	GARRETT & LAWANDA LEMLEY
8	L. JAMES & LINDA KOLBO
9	LGJK LLC
10	MELVIN & JEANNE MARCOUX
11	WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES (STATE LANDS DIVISION)
12	CHERRY POINT INDUSTRIES LLC / CHERRY POINT INDUSTRIAL PARK
13	WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES TIDELAND

Source:
Tax Parcel data obtained from Whatcom County Assessor's Office and is current as of 02/09/2011.
Tideland data obtained from Washington Department of Natural Resources on 11/03/2010: **http://fortress.wa.gov/dnr/app1/dataweb/dmmatrix.html**

0 1,250 2,500 5,000 Feet

CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: ADJACENT LAND OWNERS

DWN BY:	DATUM:	DATE:
SD	NAD83	MARCH 2012
CHK'D BY:	REV. NO.:	PROJECT NO.:
KD	1	091515338C-18-01
PROJECTION:	SCALE:	FIGURE No.:
WA SP North, Ft.	1 inch=2,500 feet	FIGURE 1-3

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 1-3 - Adjacent Land Owners.mxd

CHAPTER 2 PROJECT PERMITTING

Pacific International Terminals began initial permitting and environmental assessment for the Gateway Pacific Terminal in the late 1980s, and in 1997 received permits for what was then considered the first phase of the project. Since then, Pacific International Terminals has completed numerous additional studies and undertaken extensive collaboration with regulatory agencies, affected Native American Tribes, and other stakeholders. The studies and consultation have led to many project modifications and other changes intended to, among other considerations, mitigate impacts and address stakeholder concerns on earlier designs. This chapter summarizes the permits and authorizations that have been issued to date and outlines the remaining permits and approvals needed prior to construction of the project.

2.1 PERMITS AND AUTHORIZATIONS

Numerous permits and authorizations will be required from various federal, state, and local agencies to construct and operate the Gateway Pacific Terminal and for improvements to the Custer Spur. This section provides an overview of the permits that have already been retained and those that will be required for the project, organized by the responsible agency or jurisdiction.

2.1.1 Whatcom County

Several permits will be required from Whatcom County, as shown on Table 2-1. This section describes Whatcom County permitting activities conducted to date and summarizes additional anticipated permitting activities.

2.1.1.1 Whatcom County Permitting Activities from 1992 to Present

In 1992, after the completion of environmental studies and reviews, Pacific International Terminals submitted a SEPA Environmental Checklist and applications for a Shoreline Substantial Development Permit (SSDP) and a Major Development Permit (MDP) to Whatcom County. Whatcom County determined that the application was complete and vested the project under the then existing Whatcom County Code and Shoreline Management Plan. In late 1992, Whatcom County issued a *Notice of Determination of Significance* and a request for comments on the scope of a SEPA EIS. Whatcom County subsequently retained a team of consultants to develop the EIS in accordance with applicable requirements. The Draft and Final SEPA EIS documents were published in 1996 and 1997, respectively (Whatcom County 1996 and 1997).

Table 2–1 Anticipated Permits and Authorizations for the Gateway Pacific Terminal

Permit/Authorization Name	Lead Agency	Regulated Activity	Regulated Terminal Project Component
Clean Water Act, Section 404 and Rivers and Harbors Act Section 10 Permit	USACE	Discharge of dredge or fill material into navigable waters and construction in or over navigable waters	All components
National Historic Preservation Act, Section 106 Review	USACE	Review of any action with a federal nexus	All components
National Environmental Policy Act	USACE	Review of any action with a federal nexus	All components
Private Aids to Navigation	US Coast Guard	Installation of fixed structure or floating object within waters of the United States	Wharf, Trestle, & ship movements
Endangered Species Act, Section 7 Consultation	USFWS and NOAA Fisheries	Potential impacts to federally listed species and/or their designated critical habitats	All components
Marine Mammal Protection Act, Marine Mammals	NOAA Fisheries	Potential impacts to marine mammals, including whales.	Wharf, Trestle, & ship movements
Magnuson-Stevenson Act	NOAA Fisheries	Potential impacts to designated Essential Fish Habitat	Wharf & Trestle
Hydraulic Project Approval(s)	WDFW	Project uses, diverts, or changes flow or bed of waters of the state	All components
Aquatic Lease Agreement	WDNR	Long-term lease of state-owned aquatic lands	Wharf & Trestle on State Lands
Forest Practices Application	WDNR	Conversion of forest lands	Upland components
Clean Water Act, Section 401 Water Quality Certification	Ecology	Discharges to waters of the US, including wetlands	All components
Coastal Zone Management Consistency Determination	Ecology	Qualifying activity within a coastal county	All components
NPDES General Industrial Stormwater Permit	Ecology	Discharge of stormwater to surface waters	All components
NPDES General Stormwater Permit for Construction	Ecology	Construction activities that disturb 1 acre or more	Upland components
Clean Air Act – Order of Approval to Construct	Northwest Clean Air Agency	New or modified source of air pollution	All components
Building Permits	Whatcom County	Constructing any permanent structure	All components
Certificate of Occupancy	Whatcom County	Begin use of constructed building	All components
Major Project Permit	Whatcom County	Land Use approval	All components
Shoreline Substantial Development Permit	Whatcom County	Land Use approval within the shoreline jurisdiction	All components within the shoreline jurisdiction
Land Disturbance Permit	Whatcom County	For any land disturbing activities	Upland components
State Environmental Policy Act Threshold Determination	Whatcom County	Any non-exempt development activities	All components
Street Vacation	Whatcom County	Vacation of public rights-of-way	Whatcom County rights-of-way

2.1.1.2 Shoreline Substantial Development Suit and Settlement Agreement

In 1997, Whatcom County issued an SSDP (SHS92-0020) and an MDP (MDP92-0003) to Pacific International Terminals allowing construction and operation of the Terminal. The SSDP was subsequently appealed[1] by the Washington State Department of Ecology (Ecology), the Washington Department of Fish and Wildlife (WDFW), and a coalition of five environmental groups represented by the Washington Environmental Council. The parties settled the appeal in 1999 with a formal Settlement Agreement. The execution of the Settlement Agreement[2] among all parties added a number of conditions to the 1997 SSDP.

In 2009, Whatcom County administratively affirmed the effectiveness of the 1997 SSDP and Settlement Agreement and determined that no additional review under the County's Shoreline Management Plan would be required for the project to be developed as it was permitted.

The 1997 SSDP provides for construction and operation of the proposed wharf and its connecting trestle as shown in the 1996 Draft EIS (Whatcom County 1996; note: the upland portion of the project was outside the Shoreline Management Act jurisdiction). The current development plan proposes to use the permitted wharf and trestle configuration. The configuration is the same as the design included in the approved 1997 SSDP, except where design features have been altered either to comply with, or as allowed by, the conditions of the Settlement Agreement.

The County's 2009 administrative decision also reaffirmed the 1997 MDP, which permitted construction and operation of the western portion of the project. The current development plan proposes to retain the purpose, operational characteristics, and infrastructure included in the original design, but changes the layout. However, the proposed Terminal now includes a second materials handling and storage area and its infrastructure, which requires environmental review and permitting.

Pacific International Terminals has been working to implement the Settlement Agreement conditions since 1999.

2.1.1.3 Additional Whatcom County Permitting Activity

Because the upland portion of the Terminal design has changed from the previously permitted project, a Major Project Permit (MPP)[3] will be required. This process will require staff review, a public hearing before the Hearing Examiner, and, probably, a closed record hearing before the County Council.

1 Neither the SEPA Final EIS nor the 1997 Major Development Permit was appealed.
2 Shoreline Hearings Board Appeals numbers 97-22 and 97-23, 1999; called 'the Settlement Agreement' in this document.
3 Note; the MPP was formerly called a Major Development Permit.

Additionally, a new SSDP[4] for the wharf and trestle is required given the change in numbers of ships and quantities and types of materials now proposed. Once the MPP is granted, several subsequent County permits will be acquired, including land disturbance, construction, and building permits.

2.1.2 Federal Permitting

Construction of project facilities that affect waters of the US, including wetlands, require an individual permit under Section 404 of the Clean Water Act, and a permit for construction in navigable waters under Section 10 of the Rivers and Harbors Act. The US Army Corps of Engineers (USACE) was identified in 1992 as the lead federal agency for the Terminal project and has continued responsibility for NEPA compliance.

Pacific International Terminals filed an initial USACE permit application (USACE Application 91-2-00203-R) for these permits after execution of the 1999 Settlement Agreement. In 2006, at the request of USACE, and given the changing nature of the project and the passage of time, Pacific International Terminals officially withdrew its original application with the express understanding that a new application would be filed in its place, without prejudice, to appropriately address environmental documentation and compliance requirements. A Joint Aquatic Resources Permit Application (JARPA) was filed for the Terminal by Pacific International Terminals on February 28, 2011, with the USACE, other appropriate agencies, and the MAP Team.

BNSF's Custer Spur improvements are expected to impact jurisdictional wetlands and streams and will require an individual Section 404 permit. The permit will also be required for expansion and upgrades to crossings of California Creek and Terrell Creek, including:

- Construction of bridge structures spanning the creeks' channels to support additional rail infrastructure; and
- Restoration of a portion of California Creek to realign it to a more natural right-angle crossing under the BNSF infrastructure.

The USACE has been identified as the lead federal agency and will be responsible for NEPA compliance for BNSF Railway's Custer Spur improvements as part of the Terminal project. This Revised Project Information Document is intended to support permitting and NEPA and SEPA processes concerning these actions.

Other permits and approvals applicable to BNSF Railway's actions are described in Table 2-2.

4 The County has issued a letter dated July 13, 2011, addressing the relationship between the new permit application and the existing permit, SHS 92-0020.

Table 2–2 Anticipated Permits and Authorizations for the Custer Spur Improvements

Permit/Authorization Name	Issuing/Performing Agency	Regulated Activity	Regulated Rail Project Components
Clean Water Act, Section 404	USACE	Discharge of dredge or fill material into navigable waters	All components
Clean Water Act, Section 401 Water Quality Certification	Ecology	Discharge to water, excavation in water, discharges to special aquatic sites	All components
NPDES General Stormwater Permit for Construction	Ecology	Construction activities that disrupt 1 acre or more	All components
National Historic Preservation Act, Section 106 Review	USACE	Review of any action with a federal nexus	All components
Coastal Zone Management Act Consistency	Ecology	Review of any action with a coastal resource nexus	All components
Endangered Species Act, Section 7 Consultation	USFWS and NOAA Fisheries	Potential impacts to federally listed species and/or their designated critical habitats	All components

2.1.3 State Approvals and Leases

At the time the SSDP and MDP applications were submitted in 1992, Pacific International Terminals also submitted an application and initiated discussions with the WDNR to secure a commercial tidelands lease. The negotiation process was placed on hold in 2002 pending the release and approval of the *Cherry Point Environmental Aquatic Reserve Management Plan* (WDNR 2010). The final plan was released in November 2010.

Other state approvals, such as Hydraulic Project Approval and Section 401 Water Quality Certification, will be pursued for the Terminal once applications are filed and in coordination with the MAP Team.

For the Custer Spur improvements, BNSF Railway will pursue a Section 401 Water Quality Certification with Ecology.

2.1.4 Environmental Review Under NEPA and SEPA

State and federal agencies with permitting jurisdiction have determined that an environmental review under SEPA and NEPA will be required. Whatcom County, the USACE, and Ecology have entered into a Memorandum of Understanding to be co-leads on a Joint NEPA/SEPA EIS that will comply with requirements under both statutes. Both SEPA and NEPA require public notice, public scoping, and an opportunity to review and comment on a Draft EIS. It is expected that these activities will be combined and conducted jointly between the three co-leads.

2.1.5 Process to Coordinate Permitting among Agencies

As shown in Tables 2-1 and 2-2, a number of agencies retain jurisdiction over various elements of the proposed project. After significant discussion with relevant federal, state, and local regulatory agencies and ORA, it was agreed that the permitting process for the Terminal would benefit from the coordination and collaboration offered by the legislatively authorized MAP Team process overseen and administered by ORA. With the agreement of all the parties involved, a MAP Team has been designated and organized to complete the permitting process for the Terminal project.

The purposes of the MAP Team are to:

- Address environmental regulatory and permit issues specific to the Terminal project.
- Provide early project review, including pre-application meetings.
- Provide interagency coordinated reviews.
- Provide regulatory and technical project comments according to a predictable schedule.
- Be a consistent review body for the project at all jurisdictional levels.

The MAP Team includes staff from Whatcom County, WDFW, WDNR, Ecology, USACE, the National Oceanic and Atmospheric Administration (NOAA), Northwest Clean Air Agency, US Environmental Protection Agency (USEPA), National Marine Fisheries Service (NMFS), local Tribes, and staff from the ORA. The MAP Team also includes technology staff providing internet-based document control and team-communication management tools.

Pacific International Terminals and BNSF anticipate securing the required permits through individual JARPA submittals respectively for the Terminal and Custer Spur improvements. BNSF Railway will directly coordinate its permitting efforts for the Custer Spur improvements with the appropriate agencies and in a manner consistent with current federal and state requirements and agreements.

2.2 TRIBAL CONSULTATION AND COORDINATION

The USACE has been leading government-to-government consultation for the project, as directed by Section 106 of the National Historic Preservation Act (NHPA), since 2009. Project description letters and vicinity maps have been sent to affected Native American Tribes, including the Lummi Nation and Nooksack Tribe. Tribal consultations on usual and accustomed fishing areas around Cherry Point, and cultural resources in the uplands, are ongoing and will continue as part of consultation under the NEPA and SEPA processes.

CHAPTER 3 PURPOSE AND NEED

Chapter 3 describes Pacific International Terminals' objective in developing the Gateway Pacific Terminal, including the purpose and the need for the proposed project.

3.1 PURPOSE OF THE PROPOSED ACTION

The purpose of the proposed Gateway Pacific Terminal project is:

> To develop and successfully operate a multimodal marine terminal, including a deep-draft wharf with access trestle and other associated upland facilities, for export and import of multiple dry bulk commodities ("multimodal deep-water bulk terminal") within the Cherry Point Industrial UGA to meet international and domestic demand. Development and operation of this Terminal furthers Pacific International Terminals, Inc.'s, business interests as an international, multimodal terminal developer and operator.

While achieving this purpose, the Gateway Pacific Terminal would further advance the economic development and environmental protection goals of the Whatcom County Comprehensive Plan's Cherry Point Industrial UGA and the WDNR-designated Cherry Point Aquatic Reserve.

3.2 PACIFIC INTERNATIONAL TERMINALS' STATEMENT OF NEED

The proposed project would meet three principal needs, each of which provides a basis for the proposed project:

1. The need to ship bulk cargo to and from Asia and other markets to meet current and future market demand;
2. The need for deep-water, bulk marine terminals in the Puget Sound region; and
3. The need for community and economic development in Whatcom County consistent with the Whatcom County Comprehensive Plan for the Cherry Point Industrial UGA.

To ensure a reasonable level of success, Pacific International Terminals needs to develop the project in a manner that responds to existing and future market demands and economic development opportunities, based on commercially efficient and effective design and operation of the Terminal, while taking appropriate measures to minimize adverse impacts on the environment.

3.2.1 The Need to Ship Bulk Commodities to and from International Markets

The Pacific Rim markets currently need a number of commodities that the US can export, including but not limited to coal, industrial minerals, aggregates, ores, wood products, and grains (see Chapter 4 for a list of potential commodities that would be handled at the Terminal). The current and

forecasted Pacific Rim demand for these commodities has been widely documented (International Monetary Fund 2010; Leow and Salamat 2010).

Forecasted growth in trade strains the capacity at US ports, particularly on the West Coast, which provides access to Pacific Rim countries. Asia represents the largest demand for commodities in the Pacific Rim region, especially China, India, Japan, and South Korea. This region includes the world's second and third largest economies in China and Japan (Barboza 2010). Estimates predict that Asia will account for 61 percent of the growth in global demand for commodities over the 15-year period from 2001 to 2015 (Griswold 2007; Park & Zhai 2004). Gross domestic product for Asia as a whole was projected to grow by about 8 percent in 2010 and by at least 7 percent in 2011, with the economies of China, India, Japan, Taiwan, and South Korea leading the way (International Monetary Fund 2010). Economic growth and improvement in the quality of life and life expectancy in Asia and across the region have created large demands for a wide range of commodities, and the demand is predicted to remain high for the long term (Leow and Salamat 2010).

The Gateway Pacific Terminal will help meet the current and expected future demand for specific commodities and for handling increased shipping trade that requires a multimodal, deep-water marine terminal.

3.2.2 The Need for a Multimodal Deep-Water Bulk Marine Terminal in the Puget Sound Region

Because of their physical nature (large quantities of voluminous, dry materials), dry bulk commodities are shipped in bulk rather than as containerized cargo. Bulk commodity cargo generally requires large ships with deep drafts. The use of large vessels allows bulk commodities to be transported more efficiently at lower cost per ton than smaller vessels would allow. The use of larger vessels also results in reduced traffic in ports and on constrained waterways.

The average size of vessels calling at US ports is growing steadily. As a result, by 2000 more than one quarter of the vessel calls to ports in the US were constrained by channel and port depths (USACE 2008). The US Maritime Administration has determined that the average size of vessels has increased as vessels have been replaced in recent years. In 2008, the average size of bulk carriers had increased 11 percent over the previous 5 years. This increase reflects the deployment of Capesize vessels into the international bulk carrier fleet. The large dimensions and deep drafts of these vessels mean that only large, deep-water terminals are capable of receiving these vessels (USACE 2008).

On the West Coast of North America, Prince Rupert, Vancouver, DeltaPort, Cherry Point, Seattle, Tacoma, and Los Angeles/Long Beach are the only locations where navigation channels with

sufficiently deep drafts (greater than 50-foot depth) are available to accommodate these vessels (Ausenco Sandwell 2010). Of those seven locations, three are located in the Pacific Northwest region of the United States. Two of these locations, Seattle and Tacoma, are already developed as ports. The Cherry Point Industrial UGA is a third location in the Pacific Northwest with the natural physical attributes to accommodate deep-draft vessels.

Over the past few decades, the demand for container terminals has also increased. As a result, most large ports in the Puget Sound region and along the West Coast with deep-water access are located in urban centers and have upgraded existing container terminals, or plan to develop new container terminals rather than deep-water bulk terminals.[1] Because container terminals occupy and are expected to continue to occupy ports with deep-water access and the substantial adjacent uplands suitable for marine terminals, the need for multimodal, deep-water bulk marine terminals is not being met in the Pacific Northwest region. No bulk marine terminal development projects are currently planned in the Puget Sound region. Moreover, ports on the Columbia River are limited by the 42-foot depth of the dredged navigation channel, and as a result can serve only smaller vessel sizes (light-loaded Panamax). Further, the Columbia River ports have been and will continue to be dependent upon continuous dredging to maintain terminal depths.

The proposed Gateway Pacific Terminal would help meet the need for deep-water bulk marine terminals that have the ability to transfer cargo effectively and efficiently between overland and waterborne modes of transport in the Puget Sound region.

3.2.3 The Need for Community and Economic Development

Both the US Government and Washington State have adopted policies and commenced initiatives to expand interstate commerce and export trade. The proposed project would help to implement both the *President's National Export Initiative* (Office of the President 2010) and the Governor's 6-Point Export Plan (Office of the Governor 2010).

The objective of the President's initiative is to double American exports over the next 5 years, starting in 2010. A critical component of stimulating economic growth in the US is ensuring that businesses can actively participate in international markets by increasing their export of goods, services, and agricultural products. The State of Washington has likewise taken steps to increase the number of Washington state companies exporting goods and services and thereby help increase exports from the state by 30 percent by 2015 (Office of the Governor 2010). Washington State's 6-point export plan was designed to generate economic growth by expanding opportunities for exporters. The 6-point

[1] See, for example, Port of Seattle's Harbor Development Strategy for Marine Cargo and Container Terminal Development Plan, and similar plans from other ports and harbors, including the Ports of Los Angeles, Long Beach, Oakland, and Tacoma.

plan aims to enhance the state's ability to move goods efficiently by supporting investments in infrastructure.

The US Department of Transportation's (USDOT) Maritime Administration determined that marine terminals are an essential link between US and foreign commerce and between waterborne transport and overland modes of transport, which together deliver goods to businesses and consumers (USACE 2008). The USDOT Maritime Administration also determined that port development and growth through increased capacity, increased efficiency, and technological improvement are crucial to support the national economy (IHS Global Insight 2009).

At the local level, Whatcom County has reiterated the need for economic and community development. The most recent update to the Whatcom County Comprehensive Plan calls for continued development of the Cherry Point Industrial UGA (Whatcom County 2010a). The Comprehensive Plan is based on many years of studies, planning, and agreements among federal, Tribal, regional, state, and local governments and interested businesses, citizens, and the community. The Plan identifies the need for natural resource industries and the potential for the Cherry Point Industrial UGA to meet this need. The County's Shoreline Master Program designates the Terminal project area as part of the Cherry Point Management Area, and specifically allows port and water-dependent uses.

The Terminal is consistent with the goals of the WDNR's Cherry Point Aquatic Reserve designation for the area and with the Reserve's Management Plan (WDNR 2010), which specifically allows this proposed development.

This project furthers state and national policies regarding international trade and economic development. The project also helps meet the economic development and other needs identified in the Whatcom County Comprehensive Plan to continue to develop the Cherry Point Industrial UGA, specifically with a multimodal, deep-water bulk marine terminal.

3.2.4 The Need for an Appropriate Site

The commercial success of the project requires a site that is strategically located to respond to existing and future market demands and economic opportunities. The site must also possess unique features and characteristics to ensure efficient and cost-effective Terminal operations. Specifically, to maximize annual throughput of commodities and to achieve the economies of scale necessary to ship low to medium value bulk commodities to international markets profitably, large trains and ships are required. A deep-draft wharf is necessary to accommodate the Panamax and Capesize vessels that currently service the commodity fleet and allow these vessels to be safely loaded or unloaded (US Maritime Administration 2009a). Since operation of these large, oceangoing vessels is the most costly

part of transporting bulk commodities, the time that each vessel spends at dock must be kept to a minimum. To achieve this operating efficiency, the Terminal must have sufficient land area, rail capacity, and ancillary infrastructure to marshal large quantities of bulk cargo quickly to or from a vessel. A large land area is needed to provide sufficient space to effectively unload and store cargo.

To meet these needs, Pacific International Terminals requires a property that:

- Is located on the West Coast of the US;
- Is of sufficient size to effectively accommodate the handling and storage of large quantities of dry bulk commodities;
- Is appropriately designated and zoned for use as a marine terminal;
- Can support a deep-water marine terminal and wharf;
- Has proximity and access to rail of sufficient length, configuration, and capacity to support the proposed use;
- Has proximity and access to major roads; and
- Has a sufficient supply of industrial water and energy.

The proposed Gateway Pacific Terminal project area meets all these criteria. The project area is strategically located and has been zoned, designated, and permitted for development as a marine terminal. The project location can accommodate the deep-draft vessels required for the successful operation of the Terminal without any development or maintenance dredging.

The proposed upland commodities handling and storage facilities are of sufficient capacity to stockpile, consistent with industry standards, on the order of 5 to 8 percent of annual throughput. The storage and handling facilities have also been designed to accommodate a complete high-capacity unit train within designated rail loops at the Terminal site.

To avoid interference with main line rail traffic, the Terminal is designed to accommodate unit trains up to 8,500 feet long within the project area. To promote efficient train handling, tracks are designed in a loop to maximize rail access and minimize area used. A rail loop of this size creates a large interior space well suited to material storage in stockpiles. The stockpile capacity required is proportional to annual throughput, since sufficient storage space must be available to handle cargo unloaded from trains and loaded into vessels efficiently. For example, the East Loop's recommended annual throughput would be approximately 2.9 million metric tons, which is consistent with the designed stockyard capacity for that area (approximately 2.75 million metric tons). Handling of different commodities requires that the commodities be segregated. Therefore, separate storage and

handling areas within the facility are required and would be accommodated with the Terminal design (i.e., the East and West Loops). Finally, the project location provides ready access to key transportation arteries and industrial water and energy sources used by existing industries.

CHAPTER 4 THE PROPOSED ACTION

This chapter presents a detailed description of the proposed action to construct and operate the Gateway Pacific Terminal. This project description is intended for consideration by "agencies with jurisdiction" during the environmental review and permitting process, and to provide information to other stakeholders and interested parties.

4.1 PROJECT OVERVIEW

The Gateway Pacific Terminal will be a multimodal, deep-water terminal to provide storage and handling for the export and import of dry bulk commodities. The Terminal would be developed on approximately 334 acres within a total project area of approximately 1,200 acres (Figure 1-2). The project area is zoned for Heavy Impact Industrial use and is located in Whatcom County's Cherry Point Industrial UGA. The Terminal would be designed to minimize impacts to associated resources while meeting the purpose and need for the project.

Terminal construction would be completed in two development stages. Construction of Stage 1 is expected to commence in 2014 when all required federal, state, and local permits and authorizations have been obtained and environmental review under NEPA and SEPA has been completed. Pacific International Terminals currently anticipates that Stage 1 will be completed by 2016 and Stage 2 by 2018 (see Section 4.4).

The Terminal would be designed to handle up to 54 million metric tons per year of dry bulk commodities. Commodities would be transferred to and from the Terminal by rail on the BNSF Railway's Custer Spur. Modern material handling equipment would be installed and effective practices would be implemented to protect the safety of Terminal employees and to protect the environment during Terminal operations.

The type and quantity of dry bulk commodities managed during the operating life of the Terminal would likely change over time depending upon customer and market demands. The Terminal's commodities storage and handling infrastructure would enable the Terminal to handle the export and import of a wide range of commodities, including grain products, coal, potash, calcined petroleum coke, and other bulk commodities. It is anticipated that the Terminal would initially manage export of calcined petroleum coke and potash from the west loop storage area and low-sulfur, low-ash coal and other coal products from the east loop storage area.

4.2 PROPERTY OWNERSHIP

Approximately 1,109 acres of the approximately 1,200-acre project area is land owned by Pacific International Terminals. The project area also includes Whatcom County road rights-of-way, state-

owned tidelands, and a small parcel of land controlled under a purchase-sale agreement (Table 4-1; Figure 1-3). In addition, a number of utility easements cross the project area. Major portions of the trestle and wharf would be located on state lands leased from the WDNR.

Table 4–1 Summary of Land Ownership and Acreage in the Project Area

Land Owner	Upland (acres)	Marine (acres)	Total (acres)
Pacific International Terminals, Inc.	1,090.5	18.2	1,108.7
Whatcom County rights-of-way	19.9	0.0	19.9
Parcel 14	29.6	0.0	29.6
State lands managed by Department of Natural Resources	0.0	43.3	43.3
Total	**1,140.0**	**61.5**	**1,201.5**

BNSF Railway would provide rail service via the Custer Spur, the only existing rail line serving the Cherry Point industrial UGA. The Custer Spur branches west from the BNSF Railway's Bellingham Subdivision main line at Custer, then travels west, then south another 6.2 miles. The width of the BNSF Railway's existing right-of-way ranges from 70 feet to over 150 feet. BNSF Railway expects to acquire approximately 43 additional acres of contiguous rights-of-way adjacent to the currently owned rights-of-way. The additional rights-of-way would be used for rail improvements required to support the Terminal and for compensatory mitigation. The estimated area of acquisition is based on an average 40-foot linear embankment along the Custer Spur, additional width for an access road parallel to the Spur between Ham Road (BNSF Railway Milepost 1.86) and Brown Road (BNSF Railway Milepost 4.95), and extra width for construction of additional receiving and departure trackage.

4.3 THE PROPOSED PROJECT

As a deep-water, multimodal marine terminal for the export and import of dry bulk commodities, the Terminal has been designed to meet the operational needs of Pacific International Terminals and to service dynamic international bulk commodity markets successfully over the long term. The Terminal design provides maximum flexibility to handle a wide range of commodities as market needs and customer demands change over time. The deep-draft wharf and storage and handling areas allow the Terminal to load large, oceangoing vessels efficiently for shipment of commodities to Asian and other international markets.

Because the Terminal would handle a broad range of dry bulk commodities during its functional life, it will be designed so that only minor changes in infrastructure would be required to accommodate different commodities, or to change from export to import. As discussed in Section 3.2.4, for successful operation, a large land area is needed to provide sufficient space to store cargo

temporarily at the Terminal and to support the required rail infrastructure. In addition, a deep-draft wharf is necessary to accommodate the large Panamax and Capesize vessels that currently service the import/export commodity trade.

For safe and effective operation, the Terminal requires extensive infrastructure and facilities, including:

- Two independently operational, industrial service rail loops (the "East Loop" and "West Loop") with sufficient trackage to handle projected bulk volumes by rail. Both loops would be connected to BNSF Railway's Custer Spur, and each loop would house associated commodity storage capacity, material handling equipment, and other required bulk handling infrastructure;
- A Shared Services Area providing access from the East and West Loops to the access trestle and wharf;
- A three-berth, deep-draft wharf with ship-loading equipment and an access trestle extending from the shoreline to the wharf;
- Stormwater management systems and other utilities;
- Specific design features to avoid, minimize, or compensate for the environmental effects of the Terminal; and
- Improvements to the BNSF Railway's existing Custer Spur, including rail receiving/departing infrastructure and a double track from the Custer Wye to the proposed Terminal.

The project layout and the locations of these general functional areas are shown in Figure 1-2.

4.3.1 East Loop

The Gateway Pacific Terminal East Loop would handle a wide variety of dry bulk commodities in its lifetime. Initially, it is anticipated that the East Loop would predominantly handle low-sulfur, low-ash coal.

The general layout of the East Loop is shown in Figure 4-1. The East Loop would include the following facilities:

- Service rail loop and unloading station;
- 80-acre stockyard and associated machinery, including stacking and reclaiming machines;
- Approximately 8,000 square feet of new buildings;
- Conveyors for outloading and inloading commodities; and
- Access roadways.

The East Loop would also include development of utilities, such as stormwater treatment facilities, electrical power, lighting, water, communications, and wastewater facilities. Features that are common throughout the Terminal are described in Sections 4.3.6 through 4.3.8.

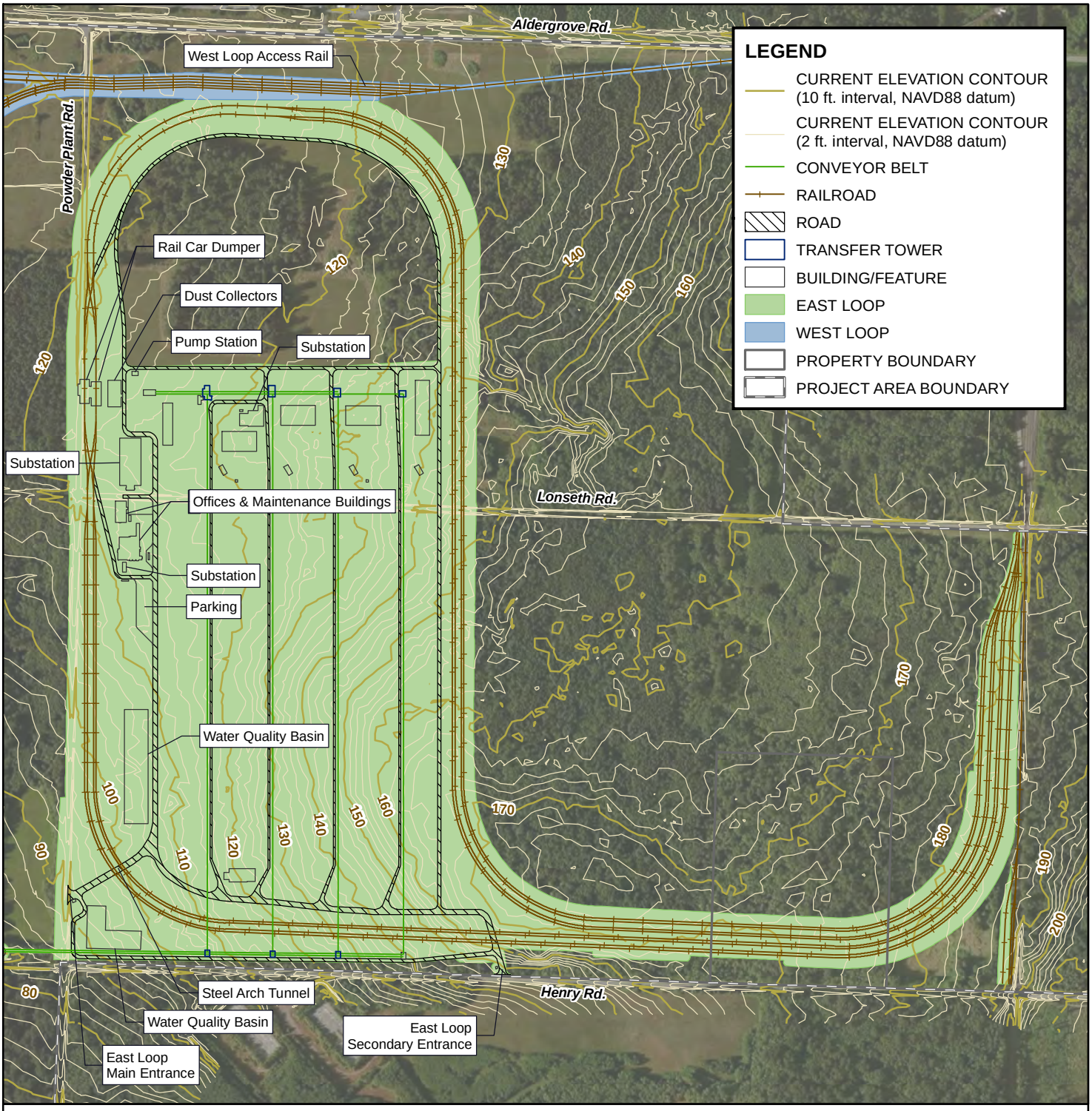
4.3.1.1 *East Loop Rail and Unloading Station*

Rail access to the East Loop would be provided from the Custer Spur. A new multiple-switch connection and new connecting trackage would join the Custer Spur just north of BNSF Railway's existing Elliot Rail Yard, located between Aldergrove Road and Lonseth Road (Section 4.3.5). The East Loop would be designed to allow unobstructed unloading of rail cars. The loop would also support staging of both loaded, inbound bulk commodity trains preparing for dumping, and empty, outbound trains being inspected for departure. When developed to its full capacity, the East Loop rail facilities would be capable of accommodating multi-train dumping of bulk commodities, with capacity to stage up to eight trains for either inbound or outbound Terminal movements. The rail would be built on an engineered embankment to provide a level rail surface, thereby minimizing fuel consumption, and improving rail operations and safety.

The East Loop would include a commodities unloading station incorporating appropriate dust controls. The station would house a single unloading shed employing a tandem rotary dumper to unload two gondola-style railway cars into a dumper pit simultaneously. The shed at the unloading station would allow commodities to be unloaded within a covered structure. At full buildout, the East Loop would house a second unloading station with a second shed to allow two trains to be unloaded simultaneously.

The proposed unloading stations would be built over a conveyor that moves the delivered commodity to the stockyard. This conveyor would also be covered and operated to control dust during cargo transfer operations. A certified scale would be integrated into the rail bed to determine the amount of commodities delivered or loaded.

To support rail-loading operations for import of commodities, a loading facility could be added to the rail loop, and the proposed outloading conveyor systems could be replaced with conveyors that feed instead to a train-loading station from the stockpiles. If a different commodity were to be handled at the East Loop, the unloading station would be modified to handle the type of rail cars used for that commodity. The remaining infrastructure would remain largely the same to manage any other bulk commodity.



Source:
Ausenco Sandwell, 143166-A100-WC001-1.dwg (Rev. P1), 12/22/2011.
David Evans & Associates, svTPXpiti0006-DEGROSS.dwg, 01/16/2012.

0 400 800 1,600
Feet

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Pacific International Terminals

CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: EAST LOOP

DWN BY:	DATUM:	DATE:
SD	NAD83	MARCH 2012
CHK'D BY:	REV. NO.:	PROJECT NO.:
KD	1	091515338C-18-01
PROJECTION:	SCALE:	FIGURE No.:
WA SP North, Ft.	1 inch=800 feet	FIGURE 4-1

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-1 - East Loop.mxd

4.3.1.2 *East Loop Stockyard and Material Handling Equipment*

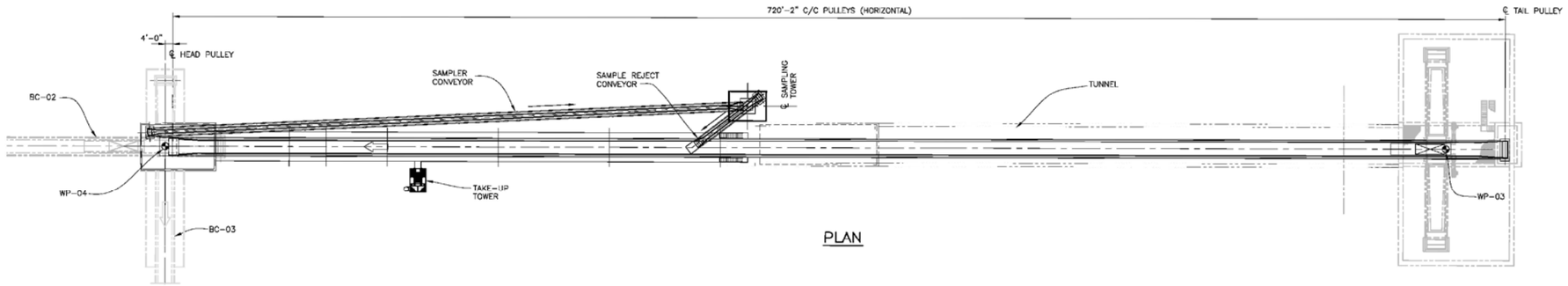
The East Loop would include infrastructure required for handling dry bulk commodities. For coal, these would include a single large, open-air stockyard serviced by stacking and reclaiming machines (called "stacker/reclaimers") and outloading/inloading conveyor lines with surge bins. The stockyard would be created on a "patio"—an approximately 80-acre, unpaved, level area with gravel-surfaced lanes between commodity stockpiles. If commodities were stored in continuous piles, the total capacity of the stockyard would be approximately 2.75 million metric tons. Initially, two stacker/reclaimers would service three stockpiles (approximately 1.25 million metric tons). At maximum capacity, the East Loop stockyard would have the capacity for five stockpiles, managed with four stacker/reclaimer lines. Stockpiles would be approximately 2,500 feet long and up to about 62 feet high; the stacker/reclaimers would be approximately 110 feet high. The rail-mounted stacker/reclaimers would move along the lanes between stockpiles to service the stockpiles. Commodities would be stockpiled by the stacker/reclaimers.

4.3.1.3 *East Loop Conveyors*

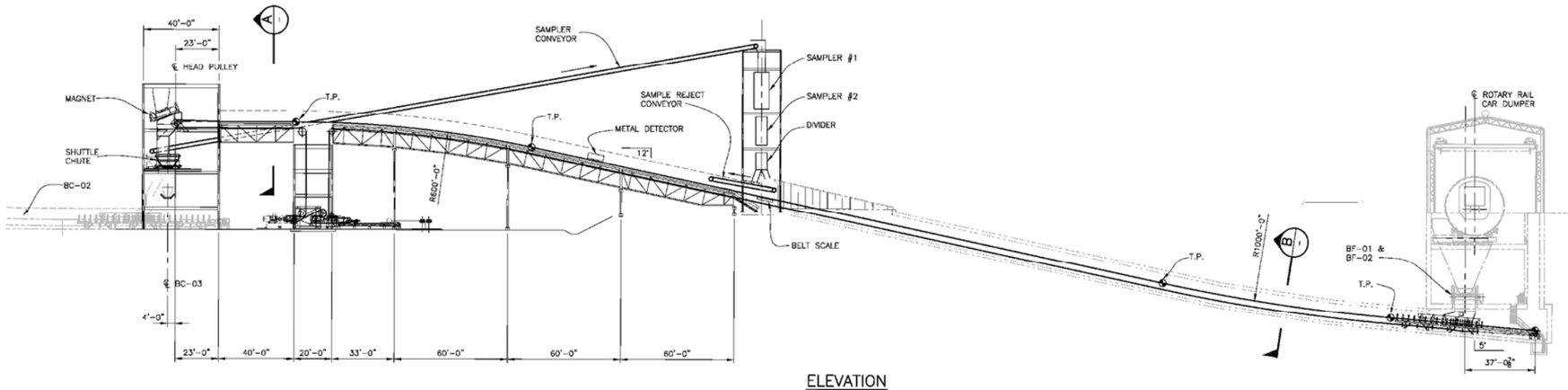
The East Loop would have multiple belt conveyor lines connected at transfer towers to move materials from one location to another (Figure 4-2). A transfer conveyor would move material from the unloading station to the infeed transfer conveyor. The infeed transfer conveyor would connect at a transfer tower to one of the four stockyard conveyor lines. These stockyard conveyors would in turn feed materials to the stacker/reclaimers that service the stockpiles.

From the stacker/reclaimers, separate conveyors would move material to other transfer towers connected to the outfeed transfer conveyor line. The outfeed conveyor would move material from the stockpiles to a surge bin that regulates the flow of material onto the shipping conveyor line. Lying outside the East Loop, the shipping conveyor would move material out of the East Loop to conveyors in the Shared Services Area, and subsequently to a final set of conveyors on top of the trestle serving shiploaders at the wharf.

Figure 4-2 shows a typical conveyor gallery and a cross section of the conveyor housing. Conveyors used for material handling at the Terminal would be constructed with covers to control dust (Figure 4-3). The conveyor belts would be driven by electric motors. Transfer points between conveyor belts at transfer towers and at the surge bin would be equipped with passive enclosure dust control systems, including staggered conveyor curtains and covered chuting.



PLAN



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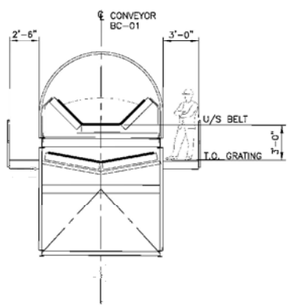
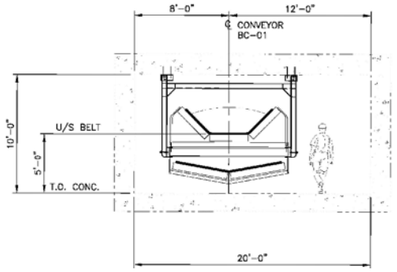


SECTION A



SECTION B

Source:
Ausenco Sandwell, 154199-A400-42050.dwg (Rev. B), 05/21/2010.

Pacific International Terminals
A Gemix Enterprise

CLIENT: PACIFIC INTERNATIONAL TERMINALS

DWN BY: SD
CHK'D BY: KD
DATUM: -
PROJECTION: -
SCALE: NOT TO SCALE

PROJECT: GATEWAY PACIFIC TERMINAL

TITLE: EXAMPLE CONVEYOR CROSS-SECTION

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: 1
FIGURE NO.: FIGURE 4-2

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-2 - Example Unload Station with Rotary Dumper and Conveyor System.mxd

Source: Pacific International Terminals, Inc.		CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.	DWN BY: SD CHK'D BY: KD DATUM: - PROJECTION: - SCALE: -	PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL TITLE: EXAMPLE OF COVERED CONVEYOR	DATE: MARCH 2012 PROJECT NO.: 091515338C-18-01 REV. NO.: - FIGURE NO.: FIGURE 4-3

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-3 - Example of Covered Conveyor.mxd

4.3.1.4 *East Loop Service Buildings*

The East Loop would have four buildings: a maintenance building (15,000 square feet), a single-story administration building that includes changing facilities (7,200 square feet), and two security gatehouses (250 square feet each).

The maintenance building would be an industrial-style, slab-on-grade, structural steel building with a painted, corrugated steel roof. The administration/changing facility would be a modular building with painted steel roof. A paved parking area with lighting would be located adjacent to these buildings. While the maintenance building is currently planned as a separate structure, it could be combined with the common administration/changing facility into a single structure with the same approximate total square footage.

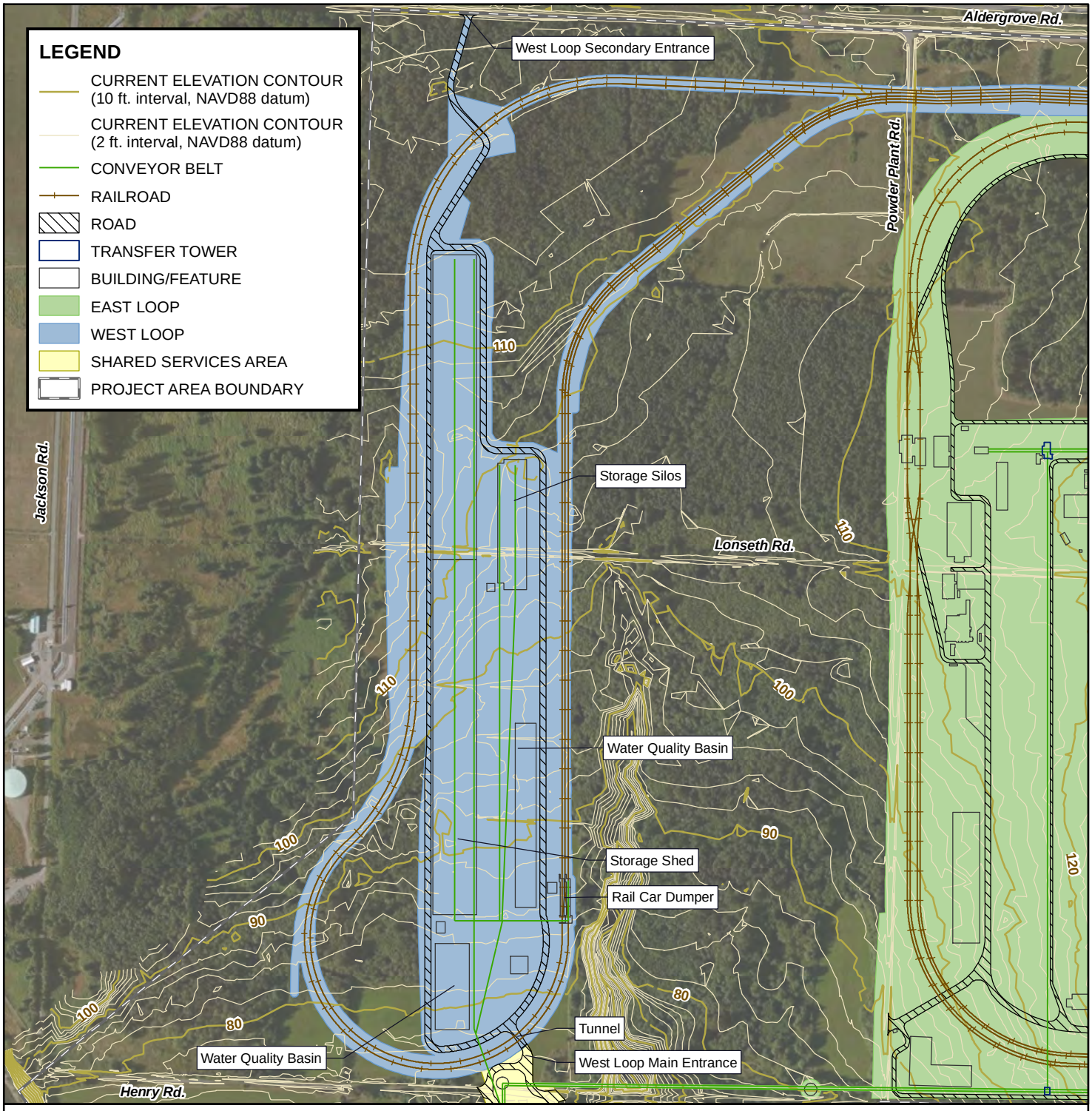
4.3.1.5 *Access Roadways*

A new paved road would be constructed to provide primary access to the East Loop (Figure 4-1). The paved access road would connect near the intersection of Gulf and Henry Roads and would be considered the Terminal's main entrance. Other East Loop roads, including a loop road paralleling the rail tracks, would be paved and would provide access to the stockyard patio and other facilities. Approximately 4 miles of roads would be built within the East Loop. The new roads would be 24 feet wide with 3- to 5-foot shoulders on both sides.

Near the main entrance, a steel-arch tunnel conveying the access road beneath the rail bed embankment would be provided to allow unobstructed access to the East Loop at all times, including when the rail lines are in use. The structure would have a span of approximately 28 feet, an interior height of 17 feet, and a length of 50 feet from headwall to headwall. To serve as a secondary access point, an at-grade crossing connecting to Henry Road would be located at the southeast corner of the East Loop. This access point would be blocked approximately 50 percent of the time at full buildout due to the presence of trains.

4.3.2 West Loop

The Gateway Pacific Terminal West Loop would be designed to handle multiple types of dry bulk commodities. Similar to the East Loop, the West Loop would be designed so that changes in types of commodities or a change from export to import operation would require only minor changes in infrastructure. The West Loop is initially planned to handle export of calcined petroleum coke and potash. The West Loop would provide rail infrastructure and covered bulk commodity storage areas. The area would include stacking and reclaiming conveyors, an unloading station, and outloading/inloading conveyor lines.



Source:
Ausenco Sandwell, 143166-A100-WC001-1.dwg (Rev. P1), 12/22/2011.
David Evans & Associates, svTPXpiti0006-DEGROSS.dwg, 01/16/2012.

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Feet

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CLIENT:
PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: WEST LOOP

DWN BY:	DATUM:	DATE:
SD	NAD83	MARCH 2012
CHK'D BY:	REV. NO.:	PROJECT NO.:
KD	1	091515338C-18-01
PROJECTION:	SCALE:	FIGURE No.:
WA SP North, Ft.	1 inch=700 feet	FIGURE 4-4

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-4 - West Loop.mxd

The West Loop would house the following features (Figure 4-4):

- Rail loop and unloading station;
- 752,500 square foot storage area and associated machinery;
- Conveyors and conveyor lines; and
- Access roadways.

Development of the West Loop would also include electrical power, water, stormwater, lighting, communications, and wastewater facilities. These features are described in Sections 4.3.6 through 4.3.8.

4.3.2.1 *West Loop Rail and Unloading Station*

Rail access to the West Loop would branch from BNSF Railway's BP lead (also called ARCO lead) via a new switch just north of Aldergrove Road. The BP lead is in turn connected to the Custer Spur. The switch would be located approximately 4,000 feet east of Powder Plant Road (Figure 1-2). From this new switch, the West Loop track would cross Aldergrove Road diagonally with a barrier-style, at-grade crossing and extend westward, running parallel to Aldergrove Road and avoiding an existing utility corridor.

The West Loop rail infrastructure would provide two inbound and two outbound tracks leading to the rail unloading station, with a third track along the east side of the loop for empty trains leaving the Terminal. This proposed rail configuration would enable two trains to be filled or unloaded at the same time, while a third train is staged on site (Figure 4-4).

The rail infrastructure along the south end of the loop would be built on an engineered embankment, while the existing grade near and along Aldergrove Road would be cut and filled to provide level elevations at the rail unloading station.

The proposed unloading station would incorporate two bottom dumper systems to allow simultaneous unloading of up to four closed-top hopper rail cars carrying commodities such as potash (see Figure 4-4). The unloading station would be built on a concrete structure designed to support the trains on continuous welded rails. The working area of each of the bottom dumper systems would be protected by a shed with open ends. A conveyor in the receiving hopper below the dumper would move delivered materials to the storage shed. The unloading station would be equipped with dust control facilities. A certified scale would be integrated into the rail bed to determine the amount of commodity delivered or loaded.

If in the future trains were to be loaded rather than unloaded, a railcar loading facility could be added to the rail loop and the conveyors replaced to provide train-loading capability from the storage area.

4.3.2.2 *West Loop Storage and Material Handling Equipment*

Covered storage facilities are planned for the West Loop, assuming that potash and calcined petroleum coke would initially be handled in this area. Storage facilities to be constructed would include a single A-frame potash storage shed with a total capacity of approximately 360,000 metric tons and six storage silos for calcined petroleum coke. The area would also be capable of housing other types of storage, such as grain silos, flat bottom sheds, or covered bins.

The A-frame potash storage shed would be supported by a concrete perimeter foundation, which also would form part of the shed's retaining walls. The shed floor would be asphalt. Inside the ridgeline of the shed's roof, a gallery structure would support a conveyor, tripper, and soft drop chutes for moving materials into the structure. At the base of the walls and on top of the concrete retaining walls, a crane rail would support a portal-style reclaim machine to feed material onto a reclaim conveyor (Figure 4-5).

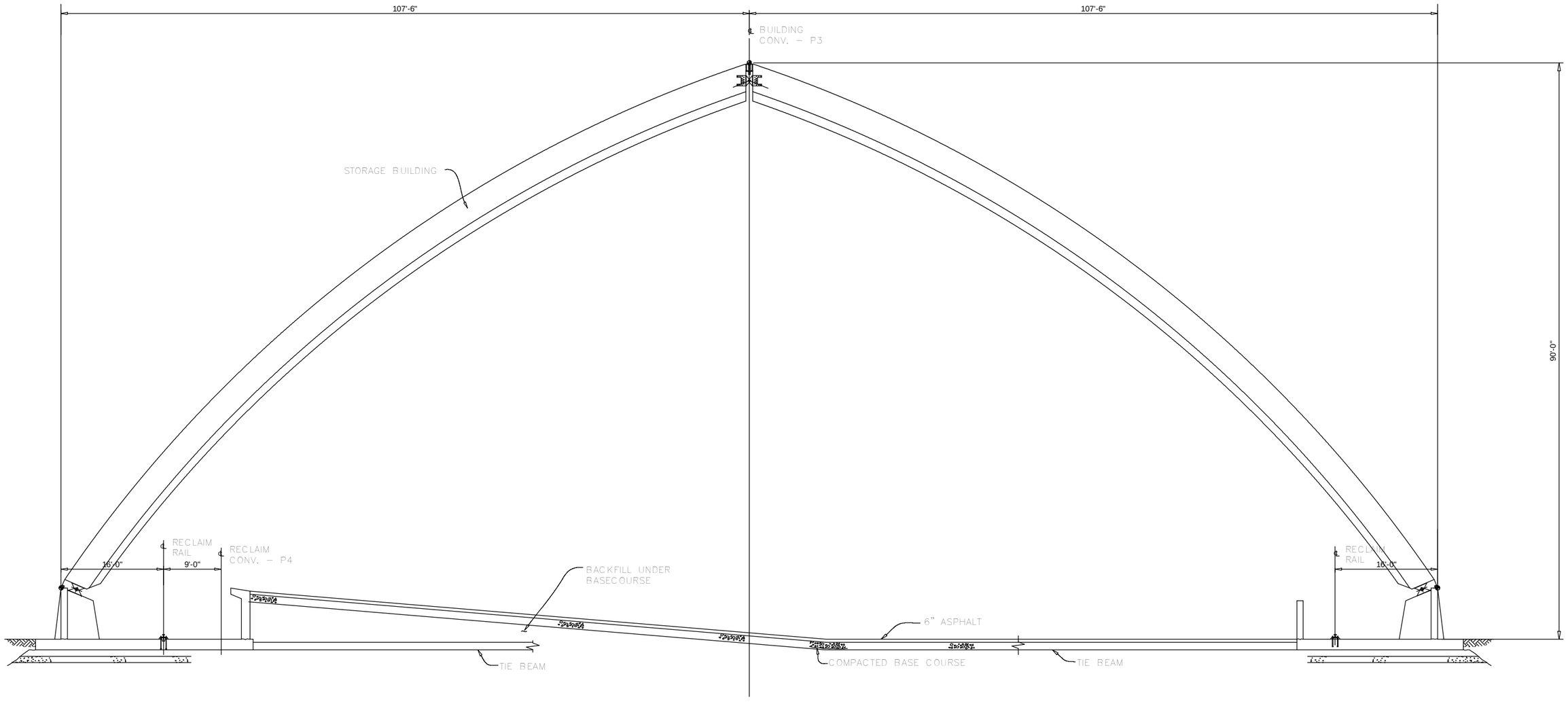
Six storage silos are currently anticipated for the storage of calcined petroleum coke at the West Loop (Figure 4-6). The cast-in-place silos would each have a capacity of 13,500 metric tons for a total storage capacity of 81,000 metric tons. Each silo would be approximately 100 feet in diameter and 180 feet tall and built on steel pilings with concrete foundations. The calcined coke would be delivered at the unloading station and fed onto a conveyor that moves the material into the top of each silo. The bottom of each silo would have a steel hopper system that opens to feed onto an out-loading conveyor that connects to the conveyors in the Shared Services Area. Both the in-loading and out-loading equipment would be covered and fitted with dust control systems.

4.3.2.3 *West Loop Conveyors*

In addition to the conveyors from the unloading station (Section 4.3.2.1), those operating inside the shed (Section 4.3.2.2), and those managing materials to and from the silos, covered transfer conveyors would move materials from the storage area to the Shared Services Area (Figure 4-4).

4.3.2.4 *West Loop Access Roadways*

A new paved road would be constructed to provide primary access to the West Loop from Henry Road. This location would be considered the main entrance for the West Loop (Figure 4-4). Other West Loop roads would include a paved road paralleling the length of the storage shed and continuing on to the secondary entrance on Aldergrove Road. The roadways would be approximately 24 feet wide with 3- to 5-foot shoulders on both sides. Approximately 2.8 miles of asphalt roadway would be built within the West Loop.



Source:
Ausenco Sandwell, 154020-6003.dwg (Rev. P1), 08/21/2006.

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PACIFIC INTERNATIONAL TERMINALS, INC.

DWN BY: SD
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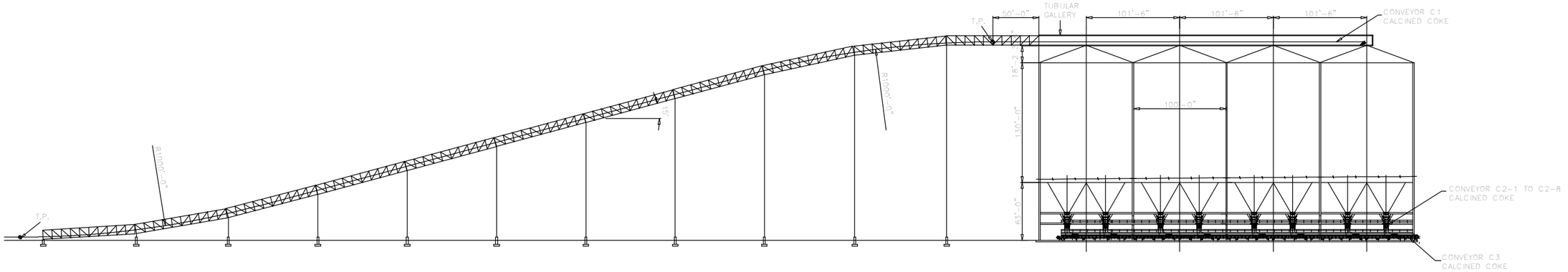
DATUM: -
PROJECTION: -
SCALE: NOT TO SCALE

PROJECT:
PROPOSED GATEWAY PACIFIC TERMINAL

TITLE:
EXAMPLE SHED DIMENSIONS

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: 1
FIGURE NO.: FIGURE 4-5

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-5 - Example Shed Dimensions.mxd



NOTE: Although drawing only shows 4 storage silos, 6 storage silos will actually be constructed.

ELEVATION

SCALE : 1

Source:
Ausenco Sandwell, 154020-2391.dwg (Rev. P1), 08/21/2006.

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CLIENT: PACIFIC INTERNATIONAL TERMINALS

DWN BY: SD
CHK'D BY: KD
DATUM: -
PROJECTION: -
SCALE: NOT TO SCALE

PROJECT: GATEWAY PACIFIC TERMINAL

TITLE: EXAMPLE STORAGE SILOS

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: 1
FIGURE NO.: FIGURE 4-6

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-6 - Example Storage Silos.mxd

A concrete box tunnel would be constructed near the main entrance at Henry Road to convey the access road beneath the rail bed embankment, allowing unobstructed access to the East Loop at all times, including when the rail lines are in use. The structure would have a span of 15 feet, an interior height of 20 feet, and a length of 100 feet from headwall to headwall. To serve as a secondary access point, an at-grade crossing connecting to Aldergrove Road would be located at the northern extent of the West Loop. When the Terminal is in full operation, this access point would be blocked approximately 20 to 30 percent of the time due to the presence of trains.

4.3.3 Shared Services Area

The linear corridor that begins at Henry Road and extends to the abutment of the access trestle would be used as a Shared Services Area (Figure 4-7). The corridor would include an access roadway as well as conveyor lines running from the East and West Loops to the access trestle. The East Loop's shipping conveyor would terminate in the Shared Services Area, and the West Loop conveyor would deliver material to the north end of the Shared Services Area.

A service building, which would serve as a longshoreman's services and administration building, would be located next to the roadway. In addition, the Shared Services Area would include a water treatment plant next to the administration building to treat sanitary wastewater from the building, an electrical substation, and a parking area.

No rail access is planned for this area.

4.3.4 Wharf and Access Trestle

Gateway Pacific Terminal would incorporate a three-berth, deep-draft wharf with ship loading equipment and an access trestle extending from the shoreline to the wharf (Figure 4-8).

The wharf and part of the access trestle would be built on state aquatic lands. The area proposed for construction of the wharf and trestle has been designated in the state's *Cherry Point Environmental Aquatic Reserve Management Plan* (WDNR 2010). The Shoreline Substantial Development Permit issued in 1997 by Whatcom County authorized the design and configuration for the wharf and trestle described here. As specified in that permit, the wharf would be 2,980 feet long and 105 feet wide, with access provided by a 1,100-foot-long, 50-foot-wide access trestle.

4.3.4.1 *Access Trestle*

The access trestle would begin at a constructed abutment inland of the shoreline bluff, cross above the bluff, and descend to the wharf (Figure 4-8). With this design, the trestle would cross over the water from above the bluff, which would remain largely undisturbed at its existing elevation. The

trestle is designed to provide access to the wharf where the vessels berth; it will not have any docking facilities.

The trestle's 50-foot width would allow two vehicles to pass each other as one enters and one leaves the wharf. The side section is designed to accommodate two enclosed conveyor lines running parallel at deck height (see Figure 4-9). At full buildout, a third enclosed conveyor line would be added to increase transfer capacity. The third conveyor would be either stacked above the other two or cantilevered off to the side (third conveyor not shown in figure). Trestle conveyors would be fully enclosed in a gallery. The design of the first two spans of the access trestle over the nearshore area will use steel deck grating to minimize shading in the intertidal zone.

4.3.4.2 *Wharf*

The wharf would be located at the trestle head and generally parallel to the shoreline; it would be designed to berth up to three vessels (Figure 4-9). The wharf would have one berth southeast of the trestle head and two berths northwest of the trestle head.

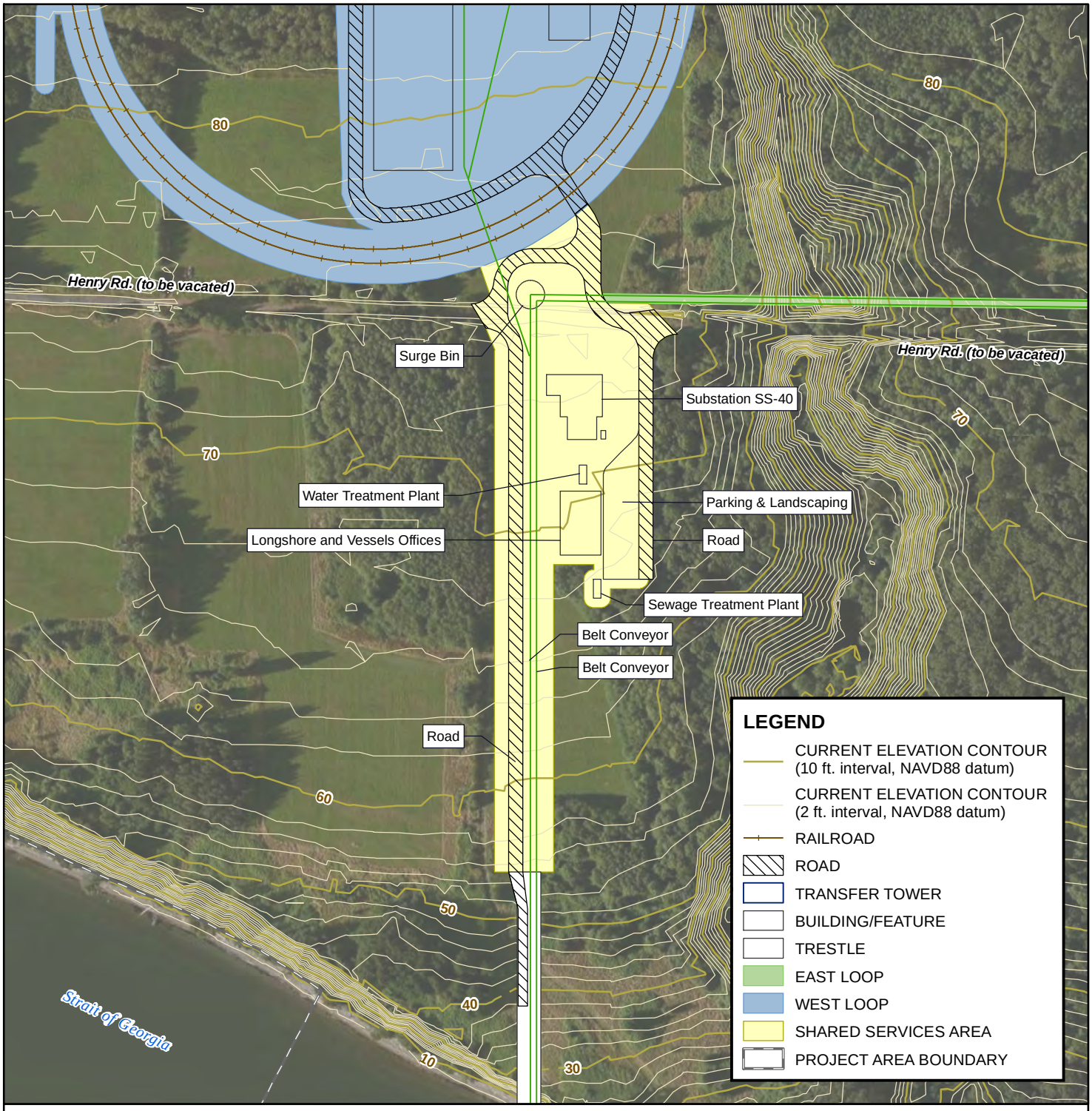
The wharf would have three berths, each of different lengths (Figure 4-8):

- Berth 1—1,137 feet long,
- Berth 2—1,227 feet long, and
- Berth 3—636 feet long.

Berth 1 is the northwestern-most berth.

The wharf would support up to three shiploaders, belt conveyors in an enclosed elevated gallery leading to each of the shiploaders, berthing fenders, and a vessel-mooring system. The wharf would be sufficiently wide to allow two lanes of vehicle access beneath the legs of the shiploaders. The elevated gallery would be located on the shore side of the wharf behind the shiploaders. The wharf would include containment for control of potentially contaminated stormwater. Uncontaminated stormwater runoff from the wharf and trestle would be discharged to the water.

Shiploaders are machines specifically designed to fill the holds of vessels with bulk commodities (Figure 4-10). Material travels on enclosed conveyor belts to the shiploader, where it is fed on a boom onto the ship and into the hold. The shiploader travels the length of the berth on rails and the boom moves up, down, inward, outward, and side-to-side to fill the vessel's hold completely and evenly while accommodating changing vessel heights from tidal change. The material discharges at the end of the boom though a chute that is designed specifically to reduce dust generation by containing the product flow into a tight stream. In addition, the shiploader would be equipped with a dust suppression



Source:
Ausenco Sandwell, 143166-A100-WC001-1.dwg (Rev. P1), 12/22/2011.
David Evans & Associates, svTPXpiti0006-DEGROSS.dwg, 01/16/2012.

0 150 300 600 Feet

N

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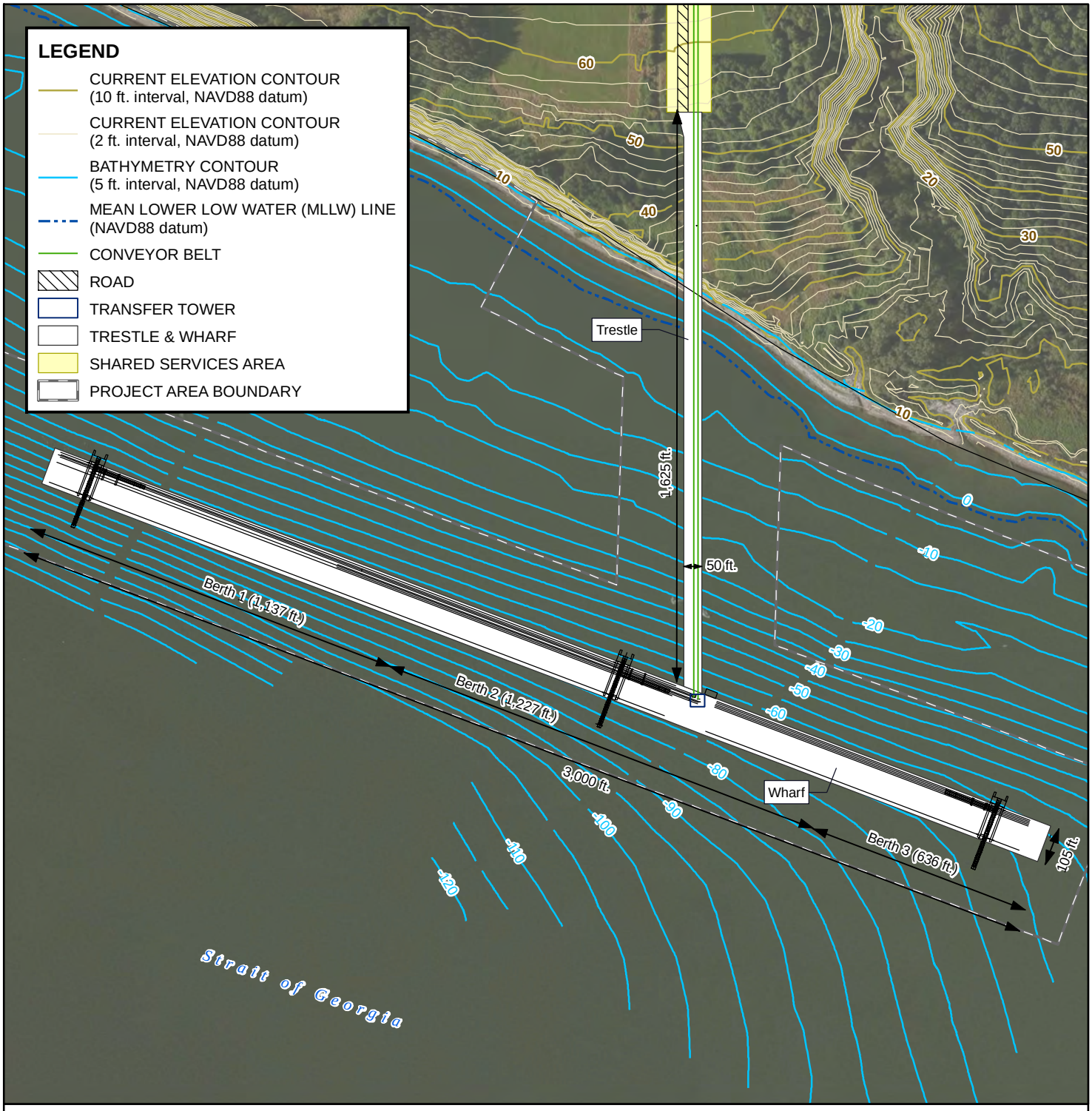
CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: SHARED SERVICES AREA

DWN BY:	DATUM:	DATE:
SD	NAD83	MARCH 2012
CHK'D BY:	REV. NO.:	PROJECT NO.:
KD	1	091515338C-18-01
PROJECTION:	SCALE:	FIGURE No.:
WA SP North, Ft.	1 inch=300 feet	FIGURE 4-7

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-7 - Shared Services Area.mxd



Source:
Ausenco Sandwell, 143166-A100-WC001-1.dwg (Rev. P1), 12/22/2011.
David Evans & Associates, svTPXpiti0006-DEGROSS.dwg, 01/16/2012.
David Evans & Associates, svEM02piti0006-Tide Topo.dwg, 02/23/2012.

0 200 400 800 Feet

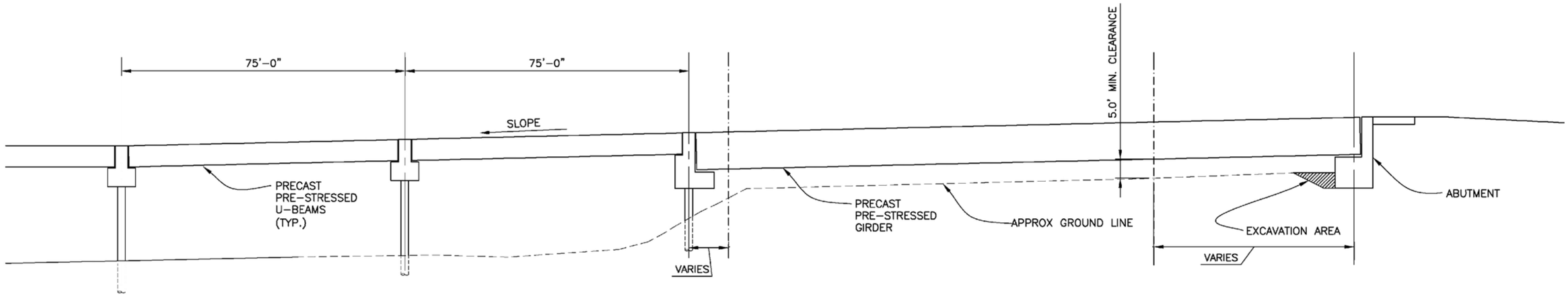
CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: WHARF AND ACCESS TRESTLE

DWN BY:	DATUM:	DATE:
SD	NAD83	MARCH 2012
CHK'D BY:	REV. NO.:	PROJECT NO.:
KD	1	091515338C-18-01
PROJECTION:	SCALE:	FIGURE No.:
WA SP North, Ft.	1 inch=400 feet	FIGURE 4-8

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-8 - Wharf and Access Trestle.mxd



Source:
Ausenco Sandwell, 154199-A700-50107.dwg (Rev. B), 12/13/2010.

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DWN BY: SD
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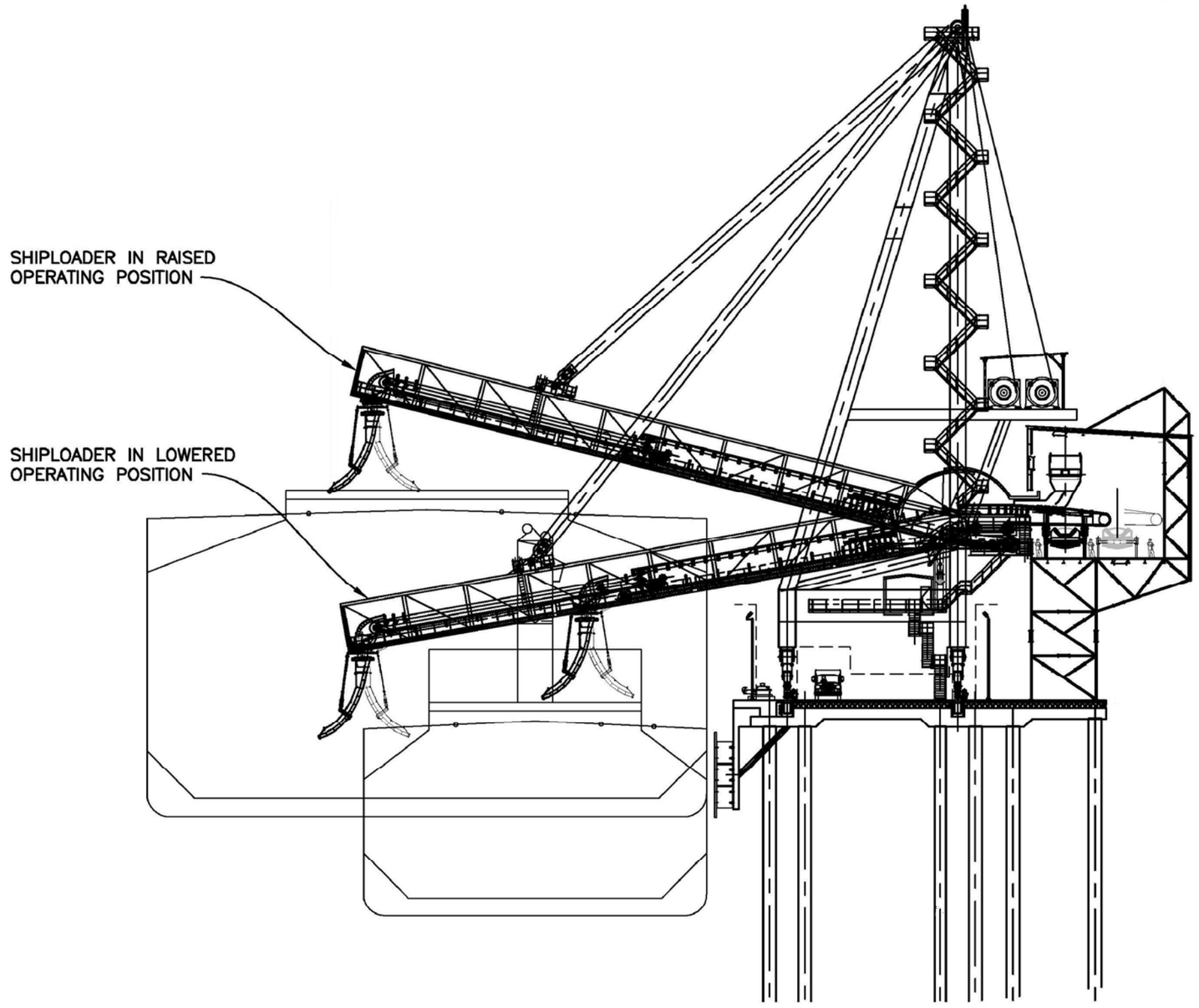
DATUM: -
PROJECTION: -
SCALE: NOT TO SCALE

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: EXAMPLE CROSS-SECTION OF ACCESS TRESTLE

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: 1
FIGURE NO.: FIGURE 4-9

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-9 - Example Cross-Section of Access Trestle.mxd



Source:
Ausenco Sandwell, 143166-A100-WC005.dwg (Rev. P1), 12/22/2011.

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CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

DWN BY: SD
CHK'D BY: KD
DATUM: -
PROJECTION: -
SCALE: NOT TO SCALE

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: EXAMPLE SHIPLOADER

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: 1
FIGURE NO.: FIGURE 4-10

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-10 - Example Shiploader.mxd

system to minimize fugitive dust from both the transfer of the commodity from the wharf conveyor to the shiploader and at the discharge at the end of the boom.

The wharf's mooring configuration would meet Puget Sound Pilots' standards for berthing, with three headlines, two breast lines, and two backsprings fore and aft on standard bollards for each berth. Each of the three berths would have embedded junction boxes and conduits for future "cold ironing" connections, which would allow vessels to use shore power while at berth. The arrangement of mooring equipment on the wharf would allow vessels to berth with either side against the dock, depending on the direction of the prevailing wind and current. The wharf would accommodate vessels with capacities of up to 250,000 dwt.

4.3.5 Rail Access

The BNSF Railway would provide the main inland freight access via BNSF Railway's existing Pacific Northwest rail network. Specifically, the BNSF Railway's existing Bellingham Subdivision runs approximately north-south roughly parallel to Interstate 5 in the project vicinity. This main line feeds the Custer Spur, the only existing rail line developed to service the Cherry Point Industrial UGA. The Custer Spur branches west from the Bellingham Subdivision main line at Custer, then travels west, then south approximately 9 miles, terminating in the Cherry Point rail yard near the ConocoPhillips Refinery, the southernmost industrial facility in the Heavy Impact Industrial zone (Figure 4-11). Improvements to approximately 6 miles of the Custer Spur are necessary to accommodate the number, length, and weight of trains that are anticipated to access the Terminal (Figure 4-11). Initially, 7,000-foot-long trains are expected, and longer trains up to 8,500 feet long may service the Terminal ultimately. To support the expected tonnages of bulk commodities to be handled at the Terminal, the following improvements would be made to the Custer Spur:

- Up to three receiving and departure tracks (called "R&D" tracks) would be developed on the south side of the BNSF Railway's Cherry Point Subdivision line starting from the Custer Wye through the Intalco Yard, Valley View Road, and to Ham Road (Figure 4-12). Each R&D track would be long enough to provide a holding area for trains up to 8,500 feet long to avoid blockage of at-grade public crossings or blocking of the BNSF Railway's main lines. Construction of the R&D tracks would include a new railbed, trackage, bridge, and drainage structures. A schematic cross section of the R&D tracks is shown in Figure 4-13.
- The Custer Spur's rails would be upgraded from the existing jointed light-rail sections to 141-pound, continuous-welded rail. This upgrade is needed to accommodate the expected tonnage of transported commodities and to manage efficiently the required maintenance demands resulting from increased numbers of trains while maintaining current service levels.

This rail upgrade would also include any required rehabilitation of the existing rail ties and other existing railbed structural improvements.

- Pending terminal volume, a second track would be added along the complete length of the Custer Spur from the Custer Wye approximately 6 miles to the new proposed Terminal connection point (Figure 4-11). The Custer Spur currently services several existing industries by way of a single main line track. A second track would protect existing rail service and switching capabilities for all customers along the line and efficiently accommodate increased rail traffic to and from the Gateway Pacific Terminal.
- A new terminal lead to connect existing tracks to the proposed Terminal would also be installed, and improvements would be made to BNSF Railway's existing Elliot Yard to support the additional rail connectivity (Figure 4-14).

No interdependent projects have been identified on the BNSF Railway's mainline—Bellingham Subdivision, or any other portion of BNSF Railway's infrastructure. BNSF Railway would be the permitting applicant for any needed permits to complete improvements on the Custer Spur. BNSF Railway would rely on this document to provide disclosure of potential effects under the requirements of NEPA and SEPA.

4.3.6 Stormwater Management Systems

The Gateway Pacific Terminal would require significant earthmoving during construction in an area with a number of known wetlands, streams, and drainage areas. As such, effective and active management of stormwater is essential to protecting local and downstream water quality and quantity.

This section describes the conceptual plan for a permanent stormwater management system to manage stormwater during both construction and operation of the Gateway Pacific Terminal. Specific procedures to protect water quality and temporary stormwater management systems that would be employed only during construction are described in Section 4.6.4.

To protect water quality and to regulate the volume of stormwater discharge from the facility during Terminal operations, a comprehensive stormwater management system would be constructed at the Gateway Pacific Terminal. As noted in Chapter 2, National Pollutant Discharge Elimination System (NPDES) industrial and construction stormwater general permits would be required from Ecology. The stormwater management system will be designed pursuant to the requirements of Whatcom County code and Ecology stormwater requirements.

SOURCE:
Burlington Northern Santa Fe Railway(BNSF), C-1X0003-Site Layout.dgn, 02/11/2011.

		Pacific International Terminals	CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL	DWN BY: SD	DATUM: -	DATE: MARCH 2012
TITLE: EXISTING RAIL FACILITIES AND PROPOSED CUSTER SPUR IMPROVEMENTS	CHK'D BY: KD	REV. NO.: 1	PROJECT NO.: 091515338C-18-01
	PROJECTION: -	SCALE: NOT TO SCALE	FIGURE No.: FIGURE 4-11

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-11 - Existing Rail Facilities.mxd

Source:
Burlington Northern Santa Fe Railway(BNSF), C-1X001-R&D_Tracks.dgn, 02/01/2011.

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CLIENT:
PACIFIC INTERNATIONAL TERMINALS, INC.

DWN BY: SD
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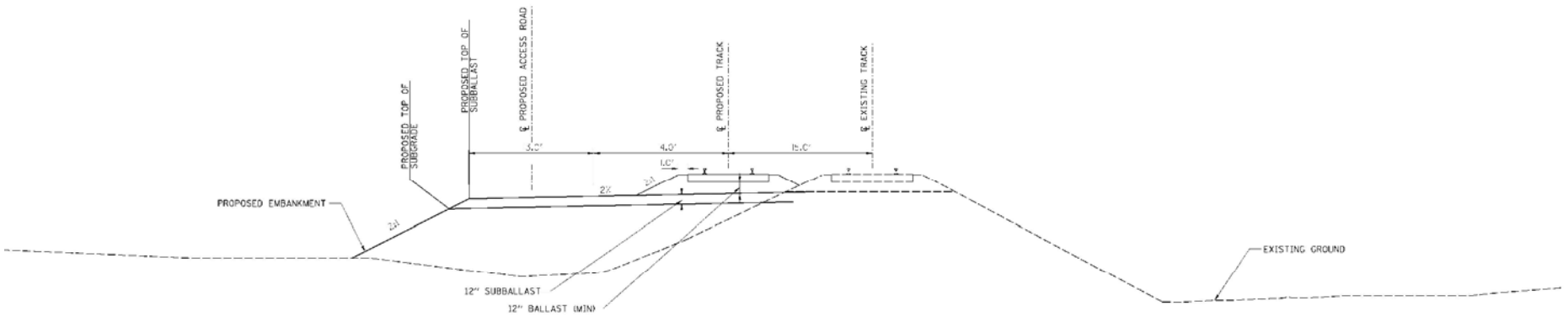
DATUM: -
PROJECTION: -
SCALE: NOT TO SCALE

PROJECT:
PROPOSED GATEWAY PACIFIC TERMINAL

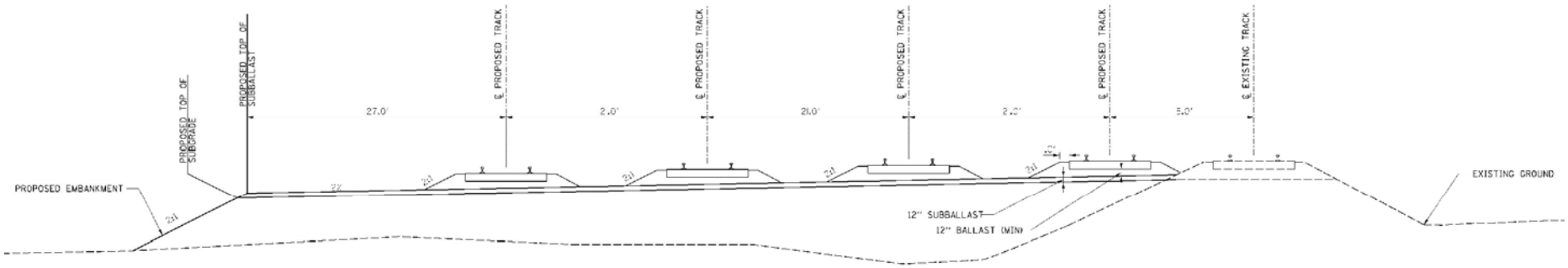
TITLE:
PROPOSED BNSF R/D IMPROVEMENTS

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: -
FIGURE NO.: FIGURE 4-12



DOUBLE TRACK TYPICAL SECTION

N.T.S.



R&D TRACKS TYPICAL SECTION

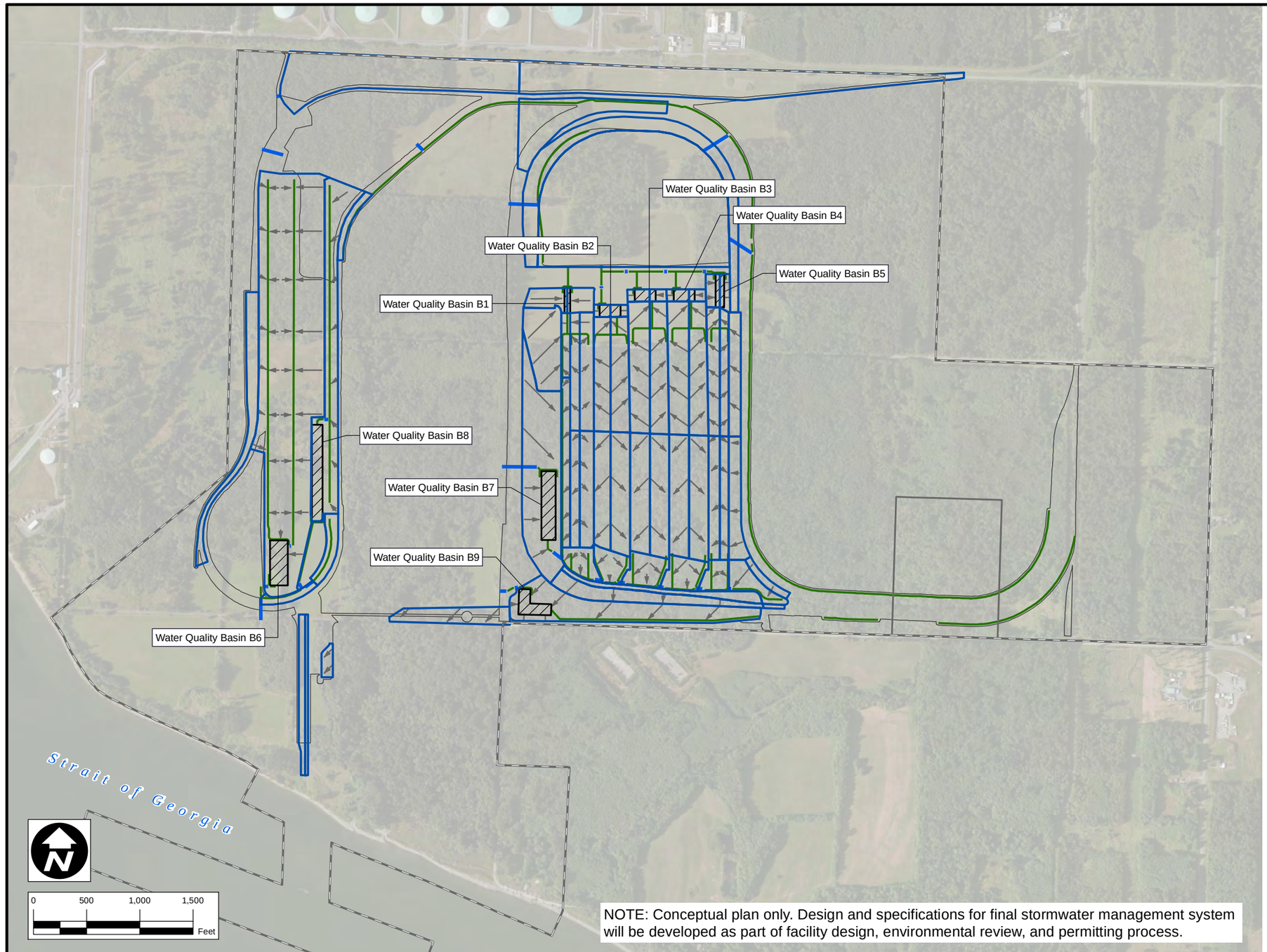
N.T.S.

Source: Burlington Northern Santa Fe Railway(BNSF), C-3X001-TYP.dgn, 02/01/2011.	Pacific International Terminals.	CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.	DWN BY: SD CHK'D BY: KD DATUM: - PROJECTION: - SCALE: NOT TO SCALE	PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL TITLE: PROPOSED BNSF TYPICAL RAILROAD SECTION	DATE: MARCH 2012 PROJECT NO.: 091515338C-18-01 REV. NO.: - FIGURE NO.: FIGURE 4-13

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-13 - Proposed BNSF Typical Railroad Section.mxd

Source: Burlington Northern Santa Fe Railway(BNSF), C-1X002-Elliott Yard.dgn, 02/01/2011.	Pacific International Terminals.	CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.	DWN BY: SD CHK'D BY: KD DATUM: - PROJECTION: - SCALE: NOT TO SCALE	PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL TITLE: PROPOSED BNSF ELLIOTT YARD IMPROVEMENTS	DATE: MARCH 2012 PROJECT NO.: 091515338C-18-01 REV. NO.: - FIGURE NO.: FIGURE 4-14

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-14 - Proposed BNSF Elliott Yard Improvements.mxd



LEGEND

- PROPOSED SITE DITCH
- PROPOSED CULVERT
- CATCHMENT FLOW DIRECTION
- WATER QUALITY BASIN
- CATCHMENT BASIN
- DEVELOPMENT FOOTPRINT
- PROPERTY BOUNDARY
- PROJECT AREA BOUNDARY

NOTE: Conceptual plan only. Design and specifications for final stormwater management system will be developed as part of facility design, environmental review, and permitting process.

Source:
Ausenco Sandwell, Catchments.dwg, 02/24/2012.

Pacific International Terminals
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CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

DWN BY: SD
CHK'D BY: KD
DATUM: NAD83
PROJECTION: WA SP North, Ft.
SCALE: 1 inch = 1,000 feet

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: STORMWATER DRAINAGE PLAN

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: 1
FIGURE NO.: FIGURE 4-15

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-15 - Proposed Stormwater Drainage Plan.mxd

The stormwater management system would be an integral part of the civil and geotechnical design of the Terminal, and would be developed pursuant to requirements of the Stormwater Manual for Western Washington (Ecology 2005). A feasibility study and conceptual design for a stormwater management system have been completed. A preliminary conceptual stormwater plan is presented in Figure 4-15. The final design and specifications for the stormwater management system would be completed as part of the facility design, environmental review, and NPDES permitting processes.

As currently conceived (Figure 4-15), the stormwater management system would consist of the following features:

- A number of sediment-trapping stormwater treatment facilities for detention and treatment of stormwater generated within the commodities-handling areas prior to discharge from the Terminal;
- A series of bioswales to capture and treat stormwater;
- A system of drainage ditches to convey stormwater to and from the sediment-trapping stormwater management basins and/or to existing natural drainage features;
- A water quality treatment facility (covering about 36 acres) in the East Loop to receive treated stormwater from the treatment ponds as well as manage runoff from undeveloped portions of the Terminal property for the overall benefit of hydrologic functions (Section 5.4.6); and
- Created and enhanced streams and riparian systems to detain and filter significantly more stormwater than under current conditions, which would have a net benefit on wetlands hydrology.

It is currently anticipated that runoff from any area within the stockyards, commodity storage areas, roadways, parking and vehicle maintenance, and loading and unloading areas would be directed to the stormwater treatment systems (Figure 4-15). After collection and treatment, the treated stormwater would be released to the water quality treatment facilities or to constructed wetlands (see Section 5.4.6). Stormwater from undeveloped portions of the Terminal property, or from areas within the development footprint that do not have the potential for becoming contaminated with pollutants, would be directed to natural and restored drainages and streams. Sheet flow on vegetated surfaces would be encouraged and concentrated flows avoided for natural drainage, allowing additional protection from sedimentation and erosion.

Construction stormwater management ponds would be built in the same locations as the containment areas for the final permanent stormwater management systems. Installation of the construction stormwater system will be among the first steps in site development and would be completed before other heavy earthwork is initiated at the Terminal (Section 4.6.4). Individual components of the stormwater management system would be designed to manage water quality for a wide range of particulates that may be entrained in stormwater during Terminal operations. Stormwater sediment-

trapping basins would be designed to trap soil sediment effectively during construction. These basins would also be designed to contain runoff so that the volumes of stormwater runoff are maintained at pre-development levels. Finally, the runoff collection trenches would be aligned to follow existing and natural watercourse routes as much as possible.

4.3.6.1 *Stormwater Management Basins*

All runoff generated within the loading areas and storage areas in the East Loop and West Loop would be collected by low-velocity interceptor ditches and conveyed to a system of sediment-trapping stormwater management basins for detention and treatment prior to discharge from the Terminal (Figure 4-15).

Sediment-trapping basins would be located in both the East Loop and West Loop. The basins would be sized to manage the characteristics of specific commodities, for example, fine particles.

It is currently anticipated that the stormwater management basins would consist of a series of three individual bays separated by finger dikes. The three bays would provide sequential stormwater treatment consisting of:

- Bay 1: Initial settlement of coarse particles;
- Bay 2: Fine particle settlement and flocculation area; and
- Bay 3: “Polishing” bay.

It is anticipated that stormwater management basins would be developed using the following preliminary design criteria:

- Detain runoff volumes to maintain stormwater discharge at the regulatory predevelopment rates; and
- Provide sufficient dwell time so that fines or other suspended solids with diameters as small as 0.025 millimeters will settle.

Final design criteria will be established during the design and environmental review process. Treated stormwater from the sediment-trapping basins would be conveyed either to the water quality treatment facility near the northern end of the commodities stockpile area or to restored or currently existing drainages. The water quality mitigation pond in the northern end of the East Loop would drain via a culvert installed in the existing watercourse as the embankment for the new railway is constructed.

The stormwater management facilities would be functional during construction to control construction stormwater. Following construction activities, the stormwater management facilities would be converted to permanent stormwater management facilities for use during Terminal operations.

4.3.6.2 *Natural Drainage System*

A system of perimeter ditches, interceptor ditches, and collector swales would convey runoff toward the water quality treatment facility or other natural drainages. These ditches and swales would be constructed as much as practical along the existing, permanent ditch and swale alignments. Vegetative lining would be provided in conveyance ditches and around the stormwater management ponds. The vegetative lining would help to reduce increases in water temperatures during sunny periods, to trap sediment and possibly adsorb some deleterious constituents in the runoff, and to minimize erosion. Open ditches would generally be V-shaped, with a maximum side slope of 2H:1V. Catch basins may be required at remote low points. Where used, underground pipes would run parallel and perpendicular to the roads, from catch basins to the nearest ditches.

4.3.6.3 *Shared Services Area*

The Shared Services Area will not house commodities storage or handling facilities. It is currently anticipated that stormwater runoff from roads and parking lots in the Shared Services Area would be treated by infiltration using roadside bioswales.

4.3.6.4 *Access Trestle and Wharf*

A stormwater management plan for the trestle and wharf would be included in the facility stormwater management system. It is anticipated that a piped system to collect stormwater would be installed in areas on the access trestle and wharf where oils or fluids would be likely to occur, such as near the shiploaders. The industrial stormwater from these locations would be collected and piped to a treatment plant located in the Shared Services Area or West Loop. It is anticipated that stormwater from other portions of the access trestle and wharf that are not exposed to potential pollutants could be drained to the adjacent upland or into the water.

4.3.7 Lighting

All roads within the Terminal would be illuminated with 150-watt, pole-mounted lighting fixtures along the roadways and trestle to provide security for traffic movement. Stanchion, ceiling, or wall-mounted, 100-watt lighting fixtures would also be installed along the conveyor walkways and transfer towers to provide illumination for worker safety, and 400-watt floodlights mounted along the wharf conveyor would provide illumination for the working areas on the wharf. Marine directional lighting would be used to minimize lighting impacts on the marine environment.

4.3.8 Utilities

This section describes utilities and other ancillary facilities proposed to support the handling of dry bulk commodities at the Terminal.

4.3.8.1 *Wastewater Management*

Sanitary wastewater from buildings would be treated in separate treatment areas adjacent to each building. Three prefabricated ("package") wastewater treatment systems would be established, one each for the East and West Loop facilities and one for the Shared Services Area. Treated wastewater from the treatment systems would be discharged to septic fields pursuant to applicable permits. Sanitary sewage from the washroom facility to be installed on the wharf would be treated, and the treated effluent would be trucked off site for treatment and disposal in accordance with applicable regulatory requirements.

4.3.8.2 *Industrial Water*

Whatcom County Public Utility District No. 1 is the designated water purveyor within the industrial area. Water supplied by Whatcom County Public Utility District No. 1 is not considered potable. Industrial, non-potable water would be supplied to the Terminal via a new, 12-inch underground pipe that connects to the existing industrial water main near the intersection of Henry Road and Kickerville Road. Water would be supplied throughout the Terminal from the main at Henry Road via several connection points. An 8-inch supply line would service the Shared Services Area, access trestle, and wharf.

4.3.8.3 *Drinking Water*

Potable domestic water for use at the facility would be provided by treating the industrial water provided by Whatcom County Public Utility District No. 1. Prefabricated ("package") reverse osmosis treatment systems would be used to service each group of buildings. Potable water would not be provided for use on ships docked at the wharf.

4.3.8.4 *Electrical Supply*

Incoming electrical power would be provided at 115 kilovolts. A new, dedicated 115 kilovolt overhead line would interconnect to the existing Bonneville Power Administration (BPA) utility transmission system located adjacent to Aldergrove Road. A new main substation would be built near the connection point east of the East Loop rail embankment. The power would be distributed from this location at 34.5 kilovolts to five large substations and at 4.16 kilovolts to two smaller substations. One of the small substations would serve the administration and maintenance buildings and the second would serve the wharf. Preliminary estimated electrical demand, based on nominal capacity, is 25 megavolt amperes.

4.3.8.5 *Communications Infrastructure*

A central control room/operations center would be housed in the main administration building in the East Loop to provide communication control between all areas of the Terminal. Fiber optic cables

would be used for communications. A site radio network and a land-based telephone network would also be installed. A closed circuit video system would be installed to allow security surveillance. The security system would use dedicated fiber optic and/or radio channels in the communications infrastructure.

4.4 PLANNED TERMINAL CONSTRUCTION STAGING

Large infrastructure involves large capital expenditures and large-scale construction activities. To spread the capital expenditures over time and reduce potential environmental effects associated with the large-scale construction, the Terminal would be constructed in two stages. During Stage 1 construction, the East Loop and other infrastructure required for opening the Terminal would be developed, including the trestle and wharf, while the West Loop area would be completed during Stage 2.

4.4.1 Stage 1 Terminal Construction

Stage 1 would involve construction of all infrastructure needed to support initial bulk-handling operations at the Terminal. Stage 1 would include construction of the East Loop, the Shared Services Area, and the access trestle and wharf. Together these components would provide the infrastructure required to support dry bulk handling capacities approaching 25 Mtpa with open-air storage.

Stage 1 construction would include installation of the following elements:

- Access trestle and wharf with one shiploader connected to one belt conveyor line;
- The Shared Services Area, including the longshoreman's services building;
- Compensatory mitigation for the fully developed facility (to address potential impacts of both Stage 1 and Stage 2 construction);
- Rail infrastructure required at full terminal capacity for the East Loop, including:
  - All bulk earthwork required for full terminal capacity, including the earthworks required to support four inbound rail lines and four outbound rail lines;
  - Tracks for two inbound rail lines and two outbound rail lines (two tracks would be installed at a later date); and
  - One rail unloading station;
- The entire East Loop stockpile patio area;
- Two stacker/reclaimer lines;
- Covered, elevated conveyor systems leading to and from the stacker/reclaimers and to the Shared Services Area;
- Access roadways and parking areas for the East Loop and Shared Services Area;

- Stormwater management facilities at the East Loop, Shared Services Area, wharf, and access trestle;
- Administration and maintenance buildings for the East Loop;
- All utilities that would be required at complete development, including water, electrical, wastewater management, and communications;
- Up to three R&D tracks on the Custer Spur near the Valley Yard; and
- Upgrade of the existing Custer Spur tracks to include structural hardening and continuous welded rail from the Valley Yard to the Terminal.

4.4.2 Stage 2 Terminal Construction

Stage 2 construction would complete the West Loop infrastructure and would provide improvements to the wharf to increase the material handling capacity by an additional 6 Mtpa of commodities. This stage of construction would add operating capacity and flexibility to handle different types and quantities of commodities at the Terminal.

Stage 2 construction would include installation of the following facilities:

- All of the West Loop's infrastructure, including:
  - All bulk earthwork for the West Loop rail lines;
  - Construction of the West Loop rail lines;
  - One rail loading/unloading station;
  - Access roadways;
  - A-frame storage shed;
  - Bulk storage silos;
  - Conveyor lines; and
  - Stormwater management system;
- A second shiploader on the wharf connected to a new conveyor line on the access trestle; and
- A second conveyor line in the Shared Services Area.

4.4.3 Operational Phasing

Four operational phases dictated by the growth in capacity of the Terminal (nominal maximal throughput) are anticipated (Table 4-2).

Table 4–2 Commodity Handling Capacity by Terminal Development Phase and Location

Operational Phase	Approximate Year (estimated)	Capacity at West Loop (Mtpa)	Capacity at East Loop (Mtpa)	Total Nominal Maximum Terminal Capacity (Mtpa)
1	2016	0	25	25
2	2018	6	25	31
3	2021	6	39	45
4	2026	6	48	54

Mtpa millions of metric tons per year

The Terminal would begin operations at completion of Stage 1 construction with an operational capacity of approximately 25 Mtpa (Table 4-2). At the completion of Stage 2 construction, Terminal capacity would reach 31 Mtpa. Two subsequent operational thresholds are envisioned (achieved approximately by 2021 and 2026), with the maximum capacity of the Terminal (54 Mtpa) reached during Operational Phase 4.

Capacity would grow from 25 to 45 Mtpa during Phase 3 by addition of a third stacker/reclaimer at the East Loop to manage an additional stockpile of 1 million metric tons within the existing East Loop patio area. Additional equipment upgrades needed to accomplish this level of capacity would likely include:

- Two additional rail lines adjacent to the two existing lines in the East Loop (no new embankment would be needed because all earthwork was completed during Stage 1 construction);
- An additional shipping conveyor with its own surge bin, running from the East Loop to the Shared Services Area;
- An additional (third) conveyor in the Shared Services Area, access trestle, and wharf; and
- A third shiploader added to the wharf.

To reach the full operational capacity of 54 Mtpa, all of the infrastructure described above would be needed along with one additional stacker/reclaimer installed at the East Loop.

4.5 TERMINAL OPERATION

The terminal would operate to move large quantities of fairly uniform, granular materials from rail transportation to oceangoing vessels. Single-commodity trains are made up of specific and consistent rail car types designed for efficient loading and unloading of commodities. Trains of this type are often called “unit” trains because they travel as a unit from the production site to the Terminal. The rail cars used to haul bulk commodities have varying lengths, and the Terminal will be designed to accommodate these variances with capabilities to handle train lengths up to 8,500 feet. Initially, unit

trains approximately 7,000 feet long are expected to serve the Terminal, and the Terminal would provide capacity to handle trains potentially up to 8,500 feet long as volumes increase.

Once a train arrives at the Terminal, it would pass through the enclosed unloading station, and rail cars would be emptied two or more at a time into a bin beneath the rails. Some types of rail cars unload through bottom doors, while rotary gondola-style cars are flipped upside down to empty.

Once unloaded, the commodity would be moved from the dumper bin along large conveyor belts to a storage area, either open or covered. At the storage area, stacker/reclaimers would place the material in storage piles managed to minimize commodity loss and maximize the efficiency of handling. Enough material would be stored in the stockpiles at the Terminal so that a vessel could be loaded immediately once at berth. A “reclaimer” would scoop commodities from open stockpiles, or from inside storage structures, onto a conveyor that connects to a “shiploader.” Both machines are specifically designed for their purpose. A reclaimer needs to be able to reach almost all portions of a pile and move material quickly onto the conveyor belts. The shiploader is specifically designed to load a floating vessel safely, subject to tides and sensitive to load balance.

4.5.1 Employment

Operating hours for the Terminal are anticipated to be 24 hours a day, 365 days a year. When fully developed, the Terminal is expected to employ 213 shift workers and 44 other workers. One-hundred seventy three (173) people are expected to be employed by the railroad and marine industries to support terminal operations directly. Table 4–3 shows the anticipated numbers of Terminal shift workers for each operational phase.

Table 4–3 Estimated Number of Terminal Employees by Shift for Each Operational Phase

Phase	Approximate Year (estimated)	Operational Capacity (Mtpa)	Number of Terminal Employees by Shift			
			7 AM–4 PM	3 PM–12 AM	11 PM-8 AM	Total
1	2016	25	39	26	24	89
2	2018	31	67	48	45	160
3	2021	45	83	61	57	201
4	2026	54	88	65	60	213

4.5.2 Commodities Likely to be Handled

A number of different dry bulk commodities are expected to be handled by the Terminal during its operational lifetime. Commodities handled would be driven by customer and market needs and by the specific terms of contracts negotiated with customers. Table 4–4 lists some of the most likely

commodities that could be handled at the Terminal within the foreseeable future, and provides some of the physical properties for these materials.

It is anticipated that in the first 10 years, the Terminal would likely manage exports of low-sulfur, low-ash coal, Canadian potash, and locally produced calcined petroleum coke.[1] In the future, various grains are also likely export commodities because of increased overseas demand and high US production rates. Aggregate materials could likely be imported during terminal construction. Other dry bulk commodities listed in Table 4–4 could be handled for import or export.

Based on the physical properties, such as solubility or degradation when wet, covered storage would be required for some products for safe handling and reducing potential environmental impacts. The East Loop is currently planned to provide uncovered storage and the West Loop to provide covered storage so that suitable facilities are available for various types of commodities.

4.5.3 Rail Operations Characteristics

The Terminal is designed to support sufficient and scalable rail infrastructure for efficient rail operations. Table 4-5 lists the number of trains anticipated to arrive at and depart the Terminal daily during the four operational phases, based on the assumption of trains up to approximately 7,000 feet long. The rail cars initially serving the East Loop would be rotary aluminum gondolas with a net carrying capacity of approximately 109 metric tons per car. Cars initially servicing the West Loop would be closed-top hopper cars with a net carrying capacity of approximately 102 metric tons per car. To manage up to 25 Mtpa, approximately five loaded trains per day would arrive at the Terminal. When the Terminal is developed to its full operating capacity, up to nine trains would arrive per day.

At approach to the Terminal and traversing the proposed terminal rail loops, trains would travel at average speeds of approximately 6 miles per hour unimpeded. It is estimated that a single train up to 125 cars long would be unloaded, on average, in 4 to 6 hours at the unloading station.

1. Calcined coke is a by-product of oil refining and is used as an energy source or a carbon-rich starting material for other manufacturing processes.

Table 4–4 Likely Commodities to Be Handled at the Terminal and Their Properties

Commodity	Solubility (mg/L)	Particle Size Range Generally as handled	Bulk Density (kg/m^3)	Bulk Density Specific gravity
Industrial Minerals				
Alumina	Very low	15% greater than No. 100 mesh 5% less than No. 300 mesh	961	3.4 - 3.6
Lime rock (crushed limestone)	Negligible	Less than 3/8 inch diameter to very fine	1,550	1.7 - 3.0
Phosphate rock	Negligible	Greater than No. 200 mesh	1,762	2.3 - 2.6
Potash	Soluble: approx 357,000 at 25°C	25% greater than No. 6 mesh 0.5% less than No. 14 mesh	1,281	2.0
Sulfur (prilled)	Not soluble	Prilled pellets – varies by source	1,920 - 2,070	2.07 at 21°C
Salts	Soluble: approx 359,000 at 25°C	1 – 5 mm	2,165	
Grain Products				
Barley	Not soluble	Unhulled, dried, grain size	Varies	See note 1
Corn	Not soluble	Shucked, dried, grain size	Varies	
Feed pellets/meal	Varies with product type	2 - 7 cm	Varies	
Soybeans	Not soluble	Cleaned, dried beans	750	
Wheat	Not soluble	Dried wheat berries	Varies	
Oil seeds	Not soluble	Clean seeds – size varies with type	Varies	
Carbon Products				
Coal	Not soluble	4% greater than 2 inch 29% less than No. 4 mesh	880	1.2
Petroleum coke (green)	Not soluble	20% 6-inch minus 80% 3-inch minus	881	>1.0
Calcined petroleum coke	Not soluble	40% less than No. 35 mesh 100% less than 18 mm	945	2.07
Aggregates				
Sand	Negligible	<2 - 20 mm	1,650	2.3 - 2.5
Gravel	Negligible	<1/2 inch	1,650	2.3 - 2.5
Crushed	Negligible	<1/2 - 8 inch	1,650	2.3 - 2.5
Wood Products				
Wood chips		95% greater than 0.21 mm 96% less than 4 mm	Varies	0.1 - 0.7
Wood pellets		1/4 inch to 2 inches	Varies	
Ores				
Pelletized ore	Not soluble	4% greater than 16 mm 2% less than 5 mm	5,000	
Concentrate	0.01 - 1.4	Lump: less than 38 mm Fines: greater than 100 mesh	2,595	

Note 1. Grain products will generally sink in water. However, some individual grains will float for a short time until saturated, then will sink. The proportion that will sink or float depends in part on moisture content, which varies with grain, season, and source.

Table 4–5 Trains per Day by Operation Phase

			Serving West Loop				Serving East Loop				Total Terminal
Phase	Approximate Year (estimated)	Operational Capacity (Mtpa)	Loaded Trains	Cars / train	Metric tons/ car	Metric tons/ train	Loaded Trains	Cars / train	Metric tons / car	Metric tons / train	Loaded Trains
1	2016	25	0.0	0.0	0.0	0.0	5.0	125	109	13,625	5.0
2	2018	31	1.0	170	101.6	17,272	5.0	125	109	13,625	6.0
3	2021	45	1.0	170	101.6	17,272	6.5	150	109	16,350	7.5
4	2026	54	1.0	170	101.6	17,272	8.0	150	109	16,350	9.0

4.5.4 Wharf Operational Characteristics

Upon initial development, commodities would be loaded into vessels at a peak rate of up to 10,000 metric tons per hour using a dedicated shiploader. Individual vessels would be loaded using a single shiploader. Typical operations for arriving vessels would include tug-assisted berthing, mooring, and preloading inspections. Once a vessel was cleared for loading, an operator would control the shiploader motions. The cargo selection and vessel loading plan would be managed though a central control room. Complete vessel loading typically takes multiple shifts over several days. Post-loading operations include a draft survey to confirm shipment size, releasing mooring lines, and tug-assisted deberthing.

4.5.5 Dust Control Measures during Operations

Procedures would be implemented and equipment would be installed to control dust during operations at the Terminal. While different commodities may require specialized handling practices, the equipment and operating procedures identified below represent potential options to effectively address the management of dust in connection with wide-ranging commodities handling operations, including the storage and transfer of coal at the East Loop during initial operations.

As commodities handled at the Terminal change over time, Pacific International Terminals will continue to review and reassess the appropriateness and effectiveness of existing systems and to implement other measures when appropriate to manage dust at the Terminal properly.

4.5.5.1 *Dust Control during Loading and Unloading Operations*

Many commodities brought to the Terminal, including coal and potash, would be unloaded inside an enclosed rail car shed building at the unloading station. The shed would be equipped with a dust collection system to control dust during rail car unloading activities. The system would consist of internal baffles to capture dust for collection in fabric filters associated with the system. The system would effectively reduce dust emissions vented from the shed during rail car unloading activities to

less than 10 percent opacity. Figure 4-16 provides a photograph of an example rail car unloading shed with an associated dust collection system.

4.5.5.2 *Dust Control at Conveyors and Transfer Points*

Other than stacker/reclaimer conveyors at the commodities storage pile, all process conveyors designed to transfer commodities throughout the Terminal would be covered to minimize exposure to external conditions, thus reducing the potential for dust production. Only the conveyors associated with the stacker/reclaimers at the commodities storage pile would be uncovered. Figure 4-3 shows a photograph of a representative similar covered conveyor system. All conveyors over water would be fully enclosed in a gallery.

Specially designed passive enclosure dust controls, including staggered conveyor curtains and curved chuting, would be employed at transfer points to manage dust effectively during these operations. Figure 4-17 shows a schematic representation of this system and a photograph of an example system. For certain commodities, such as coal, a fog-based dust collection system would be used as needed during commodity transfer operations at the Terminal. These fogging systems generate atomized water droplets that adhere to the fugitive particles of a given commodity to reduce airborne dust. Figure 4-18 provides a schematic diagram of an example fogger system.

4.5.5.3 *Dust Control at Commodities Stockpiles*

Uncovered storage of large quantities of dry particulate commodities has the potential to generate windblown dust. Dust control measures to be implemented at stockpiles would consist of a combination of compaction, fogging systems, water sprays, perimeter soil berms, regular pavement sweeping, and/or application of chemical surfactants. A water cannon would be located along the stacker/reclaimer lanes in the stockpile patio area. The water cannon would also be used to apply surfactant for additional dust suppression in the stockpile area when needed. Windscreens would be employed as needed to minimize dust generation during operations.

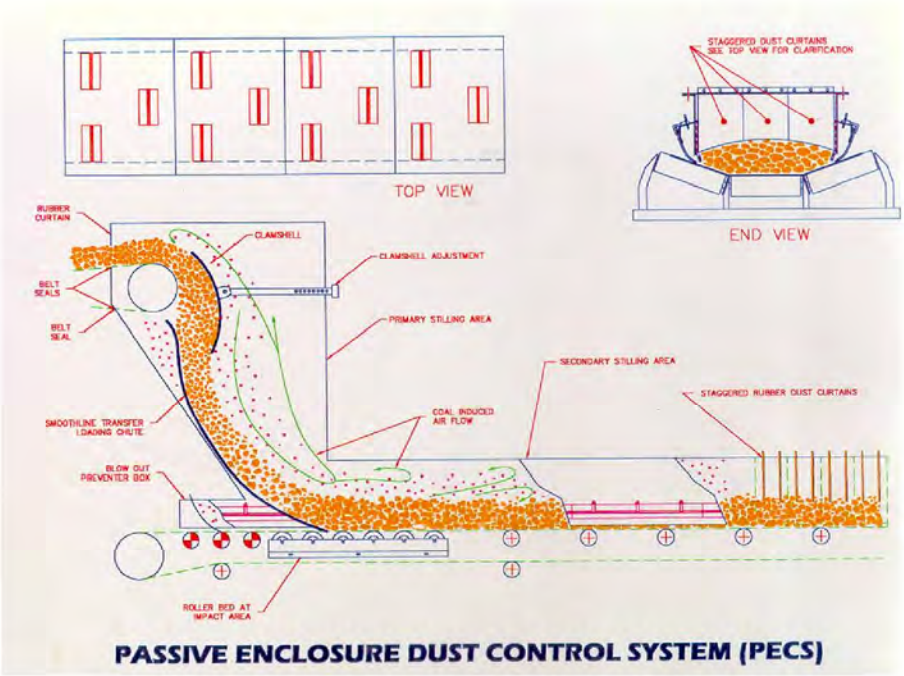
Water conservation features to be implemented would include controlling the dust suppression sprinkler system through an on-site meteorological station so that it would not operate during or just after rainfall, or when the stockpiled materials are sufficiently damp. The sprinkler would operate only during sunny periods, while also taking into account the drying effect of wind.

4.5.6 Vessel Traffic

Commodities would be moved by oceangoing vessel to and from the Terminal. Approximately 221 vessels (144 Panamax vessels and 77 Capesize vessels) are expected to call at the Gateway Pacific Terminal per year during Phase 1 operations. At full operational capacity, approximately 487 vessels per year are expected to call at Gateway Pacific Terminal (Table 4–6).

Source: Pacific International Terminals, Inc.		CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.	DWN BY: SD CHK'D BY: KD DATUM: - PROJECTION: - SCALE: -	PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL TITLE: EXAMPLE RAIL CAR UNLOADING SHED	DATE: MARCH 2012 PROJECT NO.: 091515338C-18-01 REV. NO.: - FIGURE NO.: FIGURE 4-16

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-16 - Example Rail Car Unloading Shed.mxd

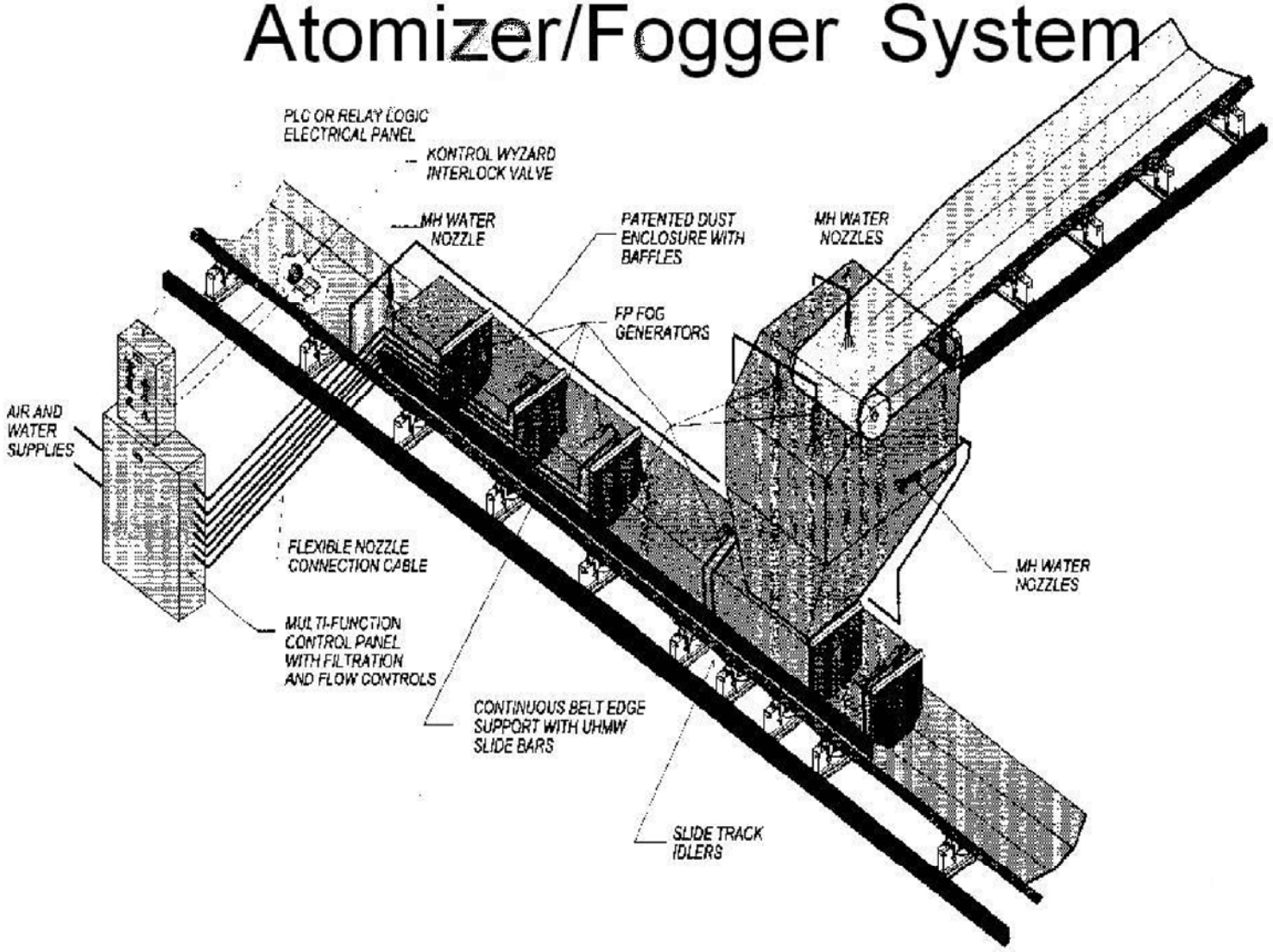


Source:
Pacific International Terminals, Inc.

		Pacific International Terminals	CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.	
PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL		DWN BY: SD	DATUM: -	DATE: MARCH 2012
TITLE: SCHEMATIC DRAWING AND PHOTOGRAPH OF EXAMPLE PASSIVE ENCLOSURE DUST SYSTEM		CHK'D BY: KD	REV. NO.: 1	PROJECT NO.: 091515338C-18-01
		PROJECTION: -	SCALE: -	FIGURE No.: FIGURE 4-17

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-17 - Example Passive Enclosure Dust System.mxd

Atomizer/Fogger System



Source: Pacific International Terminals, Inc.		CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.	DWN BY: SD CHK'D BY: KD DATUM: - PROJECTION: - SCALE: -	PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL TITLE: SCHEMATIC DRAWING OF EXAMPLE FOGGER SYSTEM	DATE: MARCH 2012 PROJECT NO.: 091515338C-18-01 REV. NO.: - FIGURE NO.: FIGURE 4-18

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 4-18 - Example Fogger System.mxd

Table 4–6 Vessels per Year by Vessel Class and Operations Phase

Operation Phase	Approximate Year (estimated)	Operational Capacity (Mtpa)	Capesize/yr		Panamax/yr		Total
			Serving East Loop	Serving West Loop	Serving East Loop	Serving West Loop	
1	2016	25	77	0	144	0	221
2	2018	31	77	31	144	59	311
3	2021	45	122	31	229	59	441
4	2026	54	138	31	259	59	487

4.5.7 Emergency Response

A site-specific emergency response plan would be developed and kept available at the Terminal at all times. The emergency response plan would specify safety procedures and spill and response measures to be implemented following an emergency or release of dangerous materials. The plan would also describe procedures for reporting and notification following an incident in a manner that is consistent with local, state, and federal rules and regulations.

Development of emergency response procedures would be coordinated with adjacent industries (BP and ALCOA), Whatcom County, the US Coast Guard, and other relevant agencies and individuals. Such coordination would include first responder protocols, notification plans, and contingency plans. The emergency response plans would define personnel responsibilities, actions to be taken, evacuation routes, and assembly areas, and would identify the location of water shutoff valves. A separate safety and emergency response plan would be developed for each specific commodity handled at the Terminal.

4.5.7.1 *Upland Spill Response*

In the event of a spill of regulated petroleum products or hazardous materials, the appropriate Gateway Pacific Terminal personnel would contact the individuals and agencies identified in the site-specific emergency response plan, alert them to the status of the situation, and work closely with the supervising agency to address the matter appropriately.

The facility design and operational plans include a number of measures to reduce the risk of hazardous materials spills:

- Hopper doors on the rail cars would be closed after they have been emptied.
- An emergency cable would be installed along the length of each conveyor so that the conveyors can be stopped immediately in the event of an emergency.

Additional spill response procedures would be described in the Emergency Response Plan and the Spill Prevention, Control, and Countermeasures (SPCC) Plan to be developed for the facility prior to initiating operations.

4.5.7.2 *Marine Spill Response*

A port operations manual including procedures for port operations and emergency response will be developed for operation of the marine terminal facility. The operations manual would define the responsibilities of vessel owners and operators calling at the Gateway Pacific Terminal, including condition and safe operations of the vessel and spill response and countermeasures. An SPCC Plan for wharf and trestle operations would be developed and implemented and will include positioning of appropriate spill containment equipment.

4.5.8 Energy Conservation

The facility has been designed to include measures for electrical energy conservation:

- Capacitor banks would be used for power factor correction, which reduces the reactive component of current and losses.
- The primary distribution system would deliver power throughout the facility at 34.5 kilovolts to reduce feeder losses with lower annual cost.
- Other energy conservation measures being considered include:
  - Loss evaluation of transformers to determine lowest life cycle cost,
  - Use of high efficiency motors,
  - Variable frequency conveyor drives, and
  - Use of energy-efficient lighting systems.

The use of variable frequency drives would help to reduce energy peaks when starting large motors by gradually ramping the motor up to speed, thus reducing the current drawn.

4.6 CONSTRUCTION

This section describes the projected construction schedule, the preliminary site preparation work needed to prepare the site for construction, and appropriate construction practices to be implemented to protect worker health and safety and the environment during the construction phase.

In general, the proposed project represents a combination of civil, site, and structural improvements to include both in-water and upland bulk handling infrastructure.

4.6.1 Terminal Construction Logistics

Terminal construction would proceed in two stages to reduce environmental effects associated with construction and to optimize fiscal management (Section 4.4). Stage 1 construction activities are anticipated to begin in 2014, after all permits and approvals are obtained, and to take approximately 2 years to complete. All construction for the East Loop, Shared Services Area, and access trestle would be completed during Stage 1. Remaining construction for the West Loop would be completed during Stage 2. No further earthwork would be needed within the Terminal to expand operations capacity beyond Stage 2 construction. Achieving full operational capacity following Stage 2 construction would involve installation of additional rail infrastructure, conveyors, stacker/reclaimers, and shiploaders to increase total freight-handling capacity. Because of the size of the in-water structures, it would take an estimated 18 months to complete the wharf and access trestle. The first commodities would be moved through the facility in 2016 with the completion of the East Loop's initial rail infrastructure, and the wharf and trestle.

The nominal finished elevation of the East Loop would be 130 feet. The top of the rail embankment near the easternmost portion of the East Loop rail embankment would be excavated to lower the elevation. This material removed would be used to fill the western portion of the East Loop area and to form the East Loop railway embankments. Based on current earthwork estimates, it is anticipated that excavated material in the East Loop would total approximately 2.2 million cubic yards, and fill at 2.7 million cubic yards.

Similarly, during Stage 2 construction of the West Loop, existing higher elevations in the northern vicinity of the West Loop would be cut to fill and raise the southern loop sections and to build rail embankments.

It is currently anticipated that any excavated overburden material would be stockpiled on site, and then later be incorporated into the constructed embankments. However, soil at the site is sensitive to moisture content, and preliminary analysis indicates it is not suitable for fill when wet. Therefore, most earthwork would be carried out during the summer months when the soil can be spread, worked, and dried if necessary to reduce its moisture content before final placement and compaction.

4.6.2 Wharf and Trestle Construction Logistics

The access trestle and wharf would be constructed using floating equipment, including one or more barge-mounted pile drivers, workboats, barges, and tugs. Equipment would also include concrete pumps and booms, welding equipment, and other miscellaneous equipment.

The trestle would be built by driving a combination of approximately 64 precast concrete piles and/or steel-pipe piles into the seabed using an impact and/or vibratory hammer. Piles are estimated to be

24 to 30 inches square, or in diameter, and estimated to average 122 feet long. Piling size and spacing is currently designed to be approximately 75 feet apart to minimize the number needed.

The wharf would be built by driving approximately 730 steel-pipe piles, each estimated to be up to 48 inches in diameter and estimated to average about 172 feet long. Piles would be driven into the seabed using an impact and/or vibratory hammer.

Piling will be delivered to the construction site by barge and driven to the proper depth. Deck construction is similar for the access trestle and wharf, and begins with construction of cast-in-place pile caps on the piling. Concrete deck beams span between the pile caps and are either cast-in-place or can consist of pre-cast beams placed with a marine derrick. Following the deck beams, the deck structure can also be cast-in-place concrete or constructed by placing pre-cast pre-stressed deck panels with a derrick. The wharf's piled foundations would provide support beneath the shiploaders, and lateral and transverse support to berthing forces. The deck would be overlaid, except in the grated area of the access trestle, with a wearing surface of up to 4 inches of asphalt. Conduits and electrical vaults would be built into the wharf structure to support potential future powering of vessels at berth with shore power. The wharf would also include crane rails to support the shiploaders, vessel mooring bollards, and a fender system.

4.6.3 Custer Spur Rail Construction Logistics

Custer Spur construction sequencing is anticipated to progress as follows and will be based on Terminal volume requirements, with the objective of limiting impacts on future rail operations, the public, and the environment as additional freight volumes are realized during future operational phases at the Terminal:

- Civil/structural improvements for both the proposed R&D tracks, as well as the double track along the Custer Spur, would be completed concurrently with Stage 1 Terminal construction.
- Rail infrastructure would be added as Terminal volumes warrant, starting first with the proposed R&D tracks and eventually the proposed double track.
- Considering potential site and soil sensitivities, all heavy civil, grading, and embankment work that directly impacts wetlands, streams, or flowing tributary ditches is projected to be completed during low-precipitation months of the year.

Preliminary construction sequencing for the railway improvements is summarized below:

- Mobilization, installation of work staging areas, and installation of stormwater/sediment management facilities;
- Clearing/grubbing the construction footprint as needed for the specific construction activity phase;

- Heavy civil construction work, including rough grading of construction footprint;
- Structural construction, including culverts and bridges along both R&D and double track segments (California and Terrell Creeks);
- Drainage profiling, including outfall protection and potential site mitigation;
- Final grading to include sub-ballast placement;
- Track construction to include surfacing; and
- Clean-up of the construction area and right-of-way.

Preliminary estimates project that construction of the BNSF Railway improvements would involve the following quantities of construction materials:

- 0 cubic yards of material imported for embankments,
- 41,000 cubic yards of excavated material moved to on-site embankments,
- 110,200 cubic yards of excavated material disposed off site,
- 34,500 cubic yards of rock fill material,
- 69,550 cubic yards of sub-ballast base material, and
- 100,000 cubic yards of rail ballast material.

4.6.4 Construction Practices

Construction will be planned to reduce environmental effects. Work would be scheduled to reduce effects on sensitive wildlife species and to protect water quality, and effective management practices would be implemented to reduce potential effects due to stormwater runoff and dust generation.

Construction of the wharf and in-water portions of the approach trestle would occur during allowed in-water construction periods from approximately July 15 through February 15 in order to reduce potential effects on marine species. No in-water work would occur below the level of mean higher high water (MHHW) between February 16 and July 14 of any year.

Prior to commencing construction, a complete construction stormwater management plan, including an SPCC Plan, would be prepared, and an NPDES General Construction Stormwater Management Permit would be obtained. The stormwater management plan would be designed to minimize the impacts to local water and environmental features associated with stormwater runoff during construction. The stormwater management plan would specify effective management practices to be implemented during construction, including sediment and erosion control and water quality protection. While erosion hazards at the site are expected to be minimal due to moderate slopes in construction areas, appropriate erosion and sediment management practices would be implemented during construction to monitor and control the turbidity of runoff discharging from the project area and to control fugitive dust. The first steps of site development would be to build temporary construction-related stormwater management features. The final design and specifications for the construction

stormwater management system would be developed as part of the environmental review and design process. Typically, a sediment-trapping geotextile filter cloth fence (“silt fence”) would be installed around the perimeter of the construction area and/or around the perimeter of any isolated, standalone work area. The geotextile fabric would be embedded into the soil, with a sandy gravel berm installed along the toe at the upgradient side of the silt fence. Other temporary erosion and sediment control features identified in the construction stormwater management plan would also be established.

Following establishment of the temporary stormwater and erosion control features, sediment-trapping basins would be constructed. The outlets of these construction stormwater management facilities would discharge treated water to selected discharge points that lead to the water quality treatment facility or to original watercourses. Next, the perimeter and interceptor ditches and collector swales that will all drain into the basins would be constructed. These ditches and swales would be constructed as much as practical along the existing, permanent ditch and swale alignments. No other bulk earthwork would commence prior to establishment of the stormwater management system.

During construction, site preparation, including earthmoving, cutting, and filling, would proceed consistent with the construction management plan. The ditches, sediment-trapping basins, and perimeter silt fences would all be monitored for sediment accumulation, which would be removed periodically. The ditches and swales would be regraded as required during construction until finished grade is achieved. Any sediment disturbed in the ditches would end up in the sediment-trapping basin, if it does not settle in the ditches. Permanent exposed cut surfaces would be vegetated, including those portions of the ditches that do not require smooth, hard surfaces.

During earthmoving work, appropriate construction practices to control dust and sedimentation would be followed, as specified in the construction stormwater management plan. These practices could include stabilizing areas quickly following earthwork, using water-spraying trucks in work areas to control dust, sweeping/and or installing wheel washes at truck entrance and egress areas, and other appropriate housekeeping procedures.

During construction, spill containment facilities would be constructed and maintained around the equipment fueling area, to supplement drip trays and other control works.

CHAPTER 5 ENVIRONMENTAL RESOURCES AND PROJECT EFFECTS

Chapter 5 describes the existing natural and human environment in and around the proposed project area and describes the potential effects of the proposed Terminal on these resources. Where effects are identified, measures to avoid, minimize, or mitigate those effects are identified.

The description of existing conditions and assessment of effects is based on the best information available at the time the original Project Information Document was issued in February 2011. Pacific International Terminals is completing specific discipline reports that describe in detail the nature and extent of specified environmental resources and associated potential effects implicated by the Terminal project. The environmental resources addressed in these referenced discipline reports include: Air Quality; Archaeological, Cultural, and Historic Resources; Earth; Fish; Hydrology; Marine Resources; Noise; Socioeconomics; Stormwater; Streams; Traffic; Wetlands; and Birds and other Wildlife. Table 5-1 includes a list of discipline reports to be issued by Pacific International Terminals, and shows the environmental resource areas addressed in each report.

The February 2011 Project Information Document included sections that addressed Wetlands, Streams, and Other Drainage; Archaeology, Cultural, and Historical Resources; Roadway and Transportation; and Air Quality Resource Areas. These sections have been omitted from the Revised Project Information Document because specific discipline reports covering these topics will be issued by Pacific International Terminals. The other sections have been retained. Additional information on environmental resources and potential project effects will also be provided in the EIS to be prepared by Whatcom County, the USACE, and Ecology pursuant to NEPA and SEPA.

Table 5-1 List of Discipline Reports

Discipline Report	Resource Topic Addressed														
	Air Quality	Archaeological, Cultural, and Historic Resources	Earth	Fish	Hydrology and Groundwater	Marine Resources	Noise	Socioeconomics	Stormwater	Streams	Traffic	Vessel Traffic and Risk Assessment	Wetlands	Wildlife - Birds	Threatened and Endangered Species
Air Quality Technical Report	■														
Avian Habitat Report						■								■	
Biological Evaluation (Preliminary Draft)				■		■				■				■	■
Cultural Resources Report		■													
Economic Impact Report								■							
Engineered Traffic Study											■				
Environmental Noise Report							■								
Geotechnical Report (Marine and Upland)			■												
Hydrologic and Hydrogeologic Investigation Report					■										
Marine Biology Baseline Inventory						■									
Marine Current and Tides Report						■						■			
Marine Sediment and Water Quality Report						■									
Preliminary Conceptual Compensatory Mitigation Plan – Revision 1										■			■		
Stormwater Information Report									■						
Stream Habitat Characterization and Fish Presence Assessment				■						■					
Vessel Traffic, Moorage, and Risk Assessment Report						■						■			
Wetland Determination and Delineation Report for Pacific International Terminals, Inc., Property										■			■		
Wetland Determination and Delineation Report for Parcel 14										■			■		
Wetland Determination and Delineation Report for Parcel 15										■			■		

5.1 EARTH

This section describes the existing physical characteristics of the project area and surrounding properties and provides an assessment of the potential environmental impacts of the Terminal on topography, geology, and soils. The site geology and soils dictate geotechnical design, including the type of foundations needed to support the structures and the specifications for the earthwork required to support related infrastructure and utilities. Facility design and construction methods can in turn have impacts on site physical characteristics.

Key issues of concern related to topography, geology, and soils include:

- Minimizing disturbance to surface soils at the Terminal site and
- Developing the site in a manner that creates stable surfaces and minimizes potential for erosion and sedimentation.

5.1.1 Affected Environment

This section describes the existing topography, soils, and geology of the project area and surrounding areas, including seismic characteristics.

5.1.1.1 *Topography and Geology*

Unstable slopes are not present in the project area except for areas along the shoreline. Generally flat to gently rolling slopes characterize the terrain. Elevations range from 70 feet below mean sea level at the proposed location of the wharf to a little more than 200 feet above mean sea level along the eastern site boundary. The highest land elevations occur nearest the eastern property boundary, with site elevation gradually decreasing to the west and to the south (Figure 5-1). Moderate slopes and steep bluffs border the westernmost stretch of shoreline. Stream 1 flows through a ravine in the south central portion of the property and drains to the Strait of Georgia.

Previous geotechnical studies (GeoEngineers 1997 and 2010; Shannon & Wilson 1993) described the project area lying within an area mapped by others as the Bellingham Glaciomarine Drift. Geologic strata characterized as Vashon Stade Advance Outwash and Cherry Point Silt underlie the glaciomarine drift.

The surficial Bellingham Glaciomarine Drift unit consists of unsorted, unstratified silt and clay with varying amounts of sand, gravel, cobbles, and occasional boulders. Glaciomarine drift is derived from sediment entrained in floating glacial ice that melts, with the sediment deposited on the seafloor. This material typically contains shells and wood fragments. The Bellingham Glaciomarine Drift is thought to have been deposited during the Everson Interstade (a period between glacial periods) approximately

11,000 to 12,000 years before present. At that time, the land surface was depressed 500 to 600 feet below current levels due to the weight of glacial ice during previous glaciation periods.

The Vashon Stade, a substage of the Vashon glaciation marked by the re-advance of glaciers, occurred between approximately 11,000 and 18,000 years ago. Sand and gravel outwash was deposited by meltwater streams in front of and along the glacial ice. As the glacier advanced, the advance outwash was eventually overridden by the glacier. As the ice retreated, recessional outwash, similar in gradation to the advance outwash, was deposited.

The retreat of the Vashon Stade Glacier approximately 13,000 years before present left the Cherry Point area at least partially submerged below sea level. The retreating ice deposited glacial debris, gravel, sand, and rock, forming depositional units up to several hundred feet thick. Over time, waves reworked and re-deposited the upper layers. The land surface rebounded upward from glacial depression, while sea level dropped, bringing the area above sea level.

The pre-Vashon sediments for the site include the Cherry Point Silt. The glacially over-consolidated Cherry Point Silt consists of stratified marine clay and silt with minor sand interbeds.

According to Shannon & Wilson (1993), Cherry Point is located in the northern reaches of the Puget Lowland, which is a moderately active tectonic province. During the brief 165-year recorded history of seismic events in the Pacific Northwest, this region has been subjected to numerous small- to moderate-magnitude earthquakes and occasionally to strong earthquakes. The four largest earthquakes to have affected the northern portion of the Puget Sound Lowland during the historic period include:

- North Cascade Earthquake, December 14, 1872: magnitude 7.3;
- Vancouver Island Earthquake, June 23, 1946: magnitude 7.3;
- Olympia Earthquake, April 13, 1949: magnitude 7.1; and
- Seattle-Tacoma Earthquake, April 29, 1965: magnitude 6.5.

These events had Modified Mercalli intensities ranging from VIII (1946, 1949, and 1965) to XI (1892) at the epicenters. Even so, Shannon & Wilson (1993) reported that none of these events exceeded intensity VI at Cherry Point. They estimated that intensity VI ground shaking would correspond to a peak ground acceleration of about 0.1 gravity (g), the maximum ground shaking to have historically occurred at the site. Shannon & Wilson (1993) proceed to recommend peak ground accelerations of 0.12 g and 0.27 g for Level 1 and Level 2 seismic designs, respectively.

Source:
NGS USA Topographic Maps provided by ArcGIS Map Service:
http://server.arcgisonline.com/v93
U.S. Geological Survey. Lummi Bay quadrangle, Washington.
1:24,000. Washington D.C.: USGS, 1973.

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CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

DWN BY: SD
CHK'D BY: KD
DATUM: NAD83
PROJECTION: WA SP North, Ft.
SCALE: 1 inch = 1,100 feet

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: USGS TOPOGRAPHIC MAP

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: 1
FIGURE NO.: FIGURE 5-1

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 5-1 - USGS Topographic Map.mxd

The project geotechnical engineer, GeoEngineers, Inc., plans additional geotechnical investigations. These investigations will include assessment of upland and marine areas and final geotechnical design recommendations.

5.1.1.2 *Soils*

This section presents both the soils classifications and descriptions for the project area based on both the Natural Resources Conservation Service (NRCS) maps and site-specific geotechnical investigations. The Soil Taxonomy classifications are used by environmental engineers, land use planners, agronomists, and wetlands specialists as a tool in the site evaluation and planning process. Geotechnical soils classifications are used by civil engineers to determine design requirements for subsurface and surface structures and related infrastructure.

Soil Taxonomy

The NRCS has identified and mapped seven soil series within the project area (Figure 5-2): Birchbay silt loam, Edmonds-Woodlyn loam, Hale silt loam, Kickerville silt loam, Neptune very gravelly sandy loam, Whatcom silt loam, and Whitehorn silt loam. Table 5-2 presents selected characteristics of each soil series. Soils are usually considered to include only the top 40 inches of depth.

Table 5-2 Mapped Soil Series in the Project Vicinity

Soil Series	Slope (percent)	Drainage Class	Parent Material	Landscape Position
Birchbay silt loam	0 to 3	Moderately well drained	Volcanic ash, loess, glaciofluvial deposits, and glaciomarine drift	Glaciomarine drift plains
Birchbay silt loam	3 to 8	Moderately well drained	Volcanic ash, loess, glaciofluvial deposits, and glaciomarine drift	Glaciomarine drift plains
Birchbay silt loam	8 to 15	Moderately well drained	Volcanic ash, loess, glaciofluvial deposits, and glaciomarine drift	Terraces and plains
Edmonds-Woodlyn loam	0 to 2	Poorly drained	Volcanic ash, loess, and glacial outwash	Outwash terraces and outwash plains
Hale silt loam (hydric)	0 to 2	Poorly drained	Volcanic ash, loess, and glacial outwash	Outwash terraces
Kickerville silt loam	3 to 8	Well drained	Volcanic ash, loess, and glacial outwash	Outwash terraces
Neptune very gravelly sandy loam	0 to 3	Excessively drained	Coastal beach deposits	Marine ridges, spits, and terraces
Whatcom silt loam	30 to 60	Moderately well drained	Volcanic ash, loess, and glaciomarine drift	Glaciomarine drift plains
Whitehorn silt loam (hydric)	0 to 2	Poorly drained	Volcanic ash, loess, glaciofluvial deposits, and glaciomarine drift	Glaciomarine drift plains

Geotechnical Classifications

Soil interpreted to be glaciomarine drift was encountered in the previous geotechnical borings advanced in uplands areas at the project site (GeoEngineers 1997, 2010). The glaciomarine drift is classified as very stiff in the upper near-surface layers, transitioning to medium stiff to soft or very soft with depth. The glaciomarine drift generally consists of clay and silt to sandy clay with variable gravel content. The glaciomarine drift deposits extend to depths of up to 120 feet below ground surface. The lower 30 to 50 feet of the glaciomarine drift in some of the borings was interpreted to be a transition zone, with significant interbedding and increased sand and gravel content beyond that typically attributed to the glaciomarine drift unit, including lenses and layers of clayey and silty sand.

Material interpreted to be glacial outwash was encountered below the glaciomarine drift in previous geotechnical borings. The glacial outwash generally consists of dense to very dense silty sand with occasional gravel to gravel with sand and silt. The glacial outwash deposits extended to the full depth (131.5 feet) explored in previous subsurface explorations.

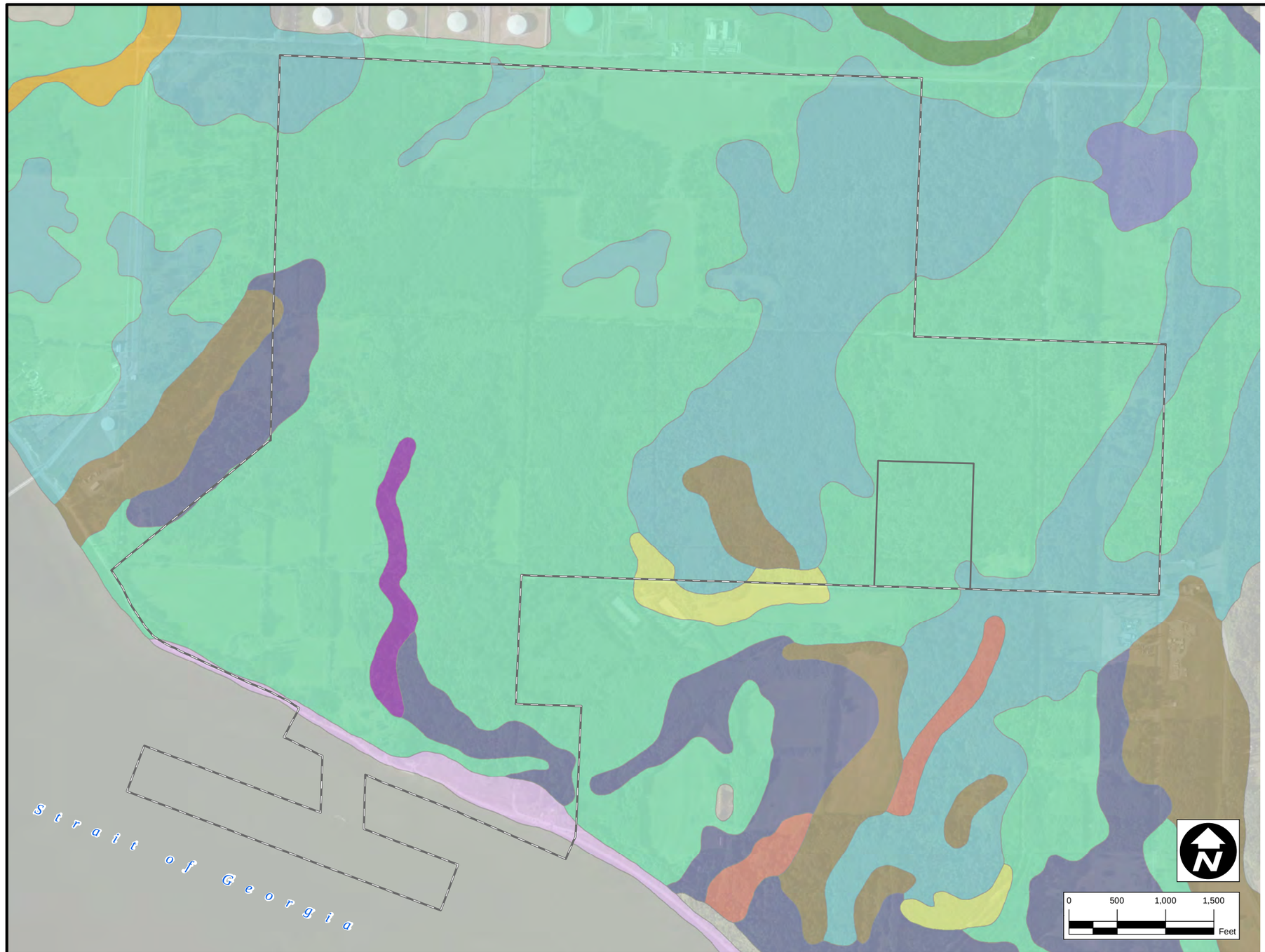
Offshore soils interpreted to be glacial outwash were encountered in previous geotechnical borings advanced during investigations for the proposed trestle and wharf plans of 1997 (Shannon & Wilson 1993). The glacial outwash encountered in borings generally consisted of very loose to loose (near the mudline) silty sand with occasional gravel to gravel with sand and silt, transitioning to dense to very dense with depth. The boring logs noted significant interbedding with depth and increased silt and clay content, including lenses and layers of clayey and silty sand and layers of sandy clay and silt. The glacial outwash deposits extended to the full depth explored in the previous explorations.

5.1.2 Potential Effects on Topography, Soils, and Geology

This section summarizes potential effects of the Terminal on topography and soils.

5.1.2.1 *Topography*

Substantial areas within the East Loop and West Loop will be graded to create level surface for rail embankments and commodity storage areas. Grading would alter the existing topographic elevations to create large level areas for commodity handling. Filling and compaction would be needed to create level rail embankments and level areas for construction of other required infrastructure, such as buildings. Even though the onshore portions of the project area are largely flat, the existing topography would be altered to new contours in many locations within the project footprint.



LEGEND

SOIL CLASSIFICATION:

- BIRCHBAY SILT LOAM (0 to 3 percent slopes)
- BIRCHBAY SILT LOAM (3 to 8 percent slopes)
- BIRCHBAY SILT LOAM (8 to 15 percent slopes)
- CLIPPER SILT LOAM - DRAINED (0 to 2 percent slopes)
- EDMONDS-WOODLYN LOAMS (0 to 2 percent slopes)
- HALE SILT LOAM - DRAINED (0 to 2 percent slopes)
- KICKERVILLE SILT LOAM (3 to 8 percent slopes)
- NEPTUNE VERY GRAVELLY SANDY LOAM (0 to 3 percent slopes)
- TROMP LOAN (0 to 2 percent slopes)
- WHATCOM SILT LOAM (30 to 60 percent slopes)
- WHITEHORN SILT LOAM (0 to 2 percent slopes)
- PROPERTY BOUNDARY
- PROJECT AREA BOUNDARY

Source:
Soil Classification data from U.S. Department of Agriculture:
http://SoilDataMart.nrcs.usda.gov

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CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

DWN BY: SD
CHK'D BY: KD
DATUM: NAD83
PROJECTION: WA SP North, Ft.
SCALE: 1 inch = 1,100 feet

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: NATIONAL RESOURCES CONSERVATION SERVICE SOIL MAP

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: 1
FIGURE NO.: FIGURE 5-2

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 5-2 - NRCS Soil Map.mxd

An in-depth geotechnical engineering evaluation is currently underway, and a complete civil engineering evaluation will be conducted as part of the final Terminal design. The design will include recommendations and specifications to maintain stable earth structures and prevent erosion hazards. These will include recommendations for erosion control measures, construction stormwater management and drainage, final facility stormwater management, cut and fill specifications, and earthworks and shoring to maintain site stability.

5.1.2.2 *Geotechnical Soil Conditions*

Geotechnical soil conditions underlying the site vary in complexity and would affect the planned Terminal development in several ways. This section summarizes these potential effects as previously reported in available geotechnical documents or as currently interpreted for the currently proposed Terminal. This section also presents strategies identified to reduce these impacts.

5.1.2.3 *Onshore Structures and Site Development*

Previous exploration programs (GeoEngineers 1997, 2010) produced consistent results: glaciomarine drift in the project area overlies advance outwash, with a transitional zone between the two units. The glaciomarine drift was typically stiff to very stiff silt and clay grading softer with depth, and the transitional zone varied from medium stiff to stiff. The glaciomarine drift and transitional zone were much thicker (over 100 feet) in the explorations at the center of the site than at the southern perimeter of the site (approximately 45 to 50 feet). GeoEngineers (1997, 2010) provided the following conclusions for preliminary planning purposes:

- Lightly loaded structures can typically be supported using conventional shallow foundations without excessive settlement from foundation loads.
- Large, heavily loaded foundations would transfer loads to the soft, compressible glaciomarine drift.
- If deep foundations are necessary because of high loads, high capacity end-bearing piles are feasible at the southern end of the site where the advance outwash was encountered at shallower depths. In the northern portions of the site, deep foundations will likely consist of lower capacity friction piles because of the greater depth to bearing soils (greater than 120 feet at recent boring locations).

5.1.2.4 *Offshore Wharf and Trestle Structure*

Conditions encountered during previous explorations (Shannon & Wilson 1993) have been interpreted to be glacial outwash. The glacial outwash encountered in borings generally consisted of very loose to loose (near the mudline) silty sand with occasional gravel to gravel with sand and silt, and transitioned

to dense to very dense with depth. Deep foundations will be necessary to accommodate high loads and the need to carry the trestle and wharf above sea level.

5.1.2.5 *Rail Loops*

Based on the American Railway Engineering and Maintenance-of-Way Association (AREMA) standards, the clay and silty to sandy clay composing the glaciomarine drift is considered a “poor” to “bad” subgrade for a railway embankment. Under these conditions, geotechnical risks arise without adequate subgrade preparation. These geotechnical risks include medium- to high-severity frost heave, fair to poor drainage, and slight to high severity pumping action along the rail alignments.

5.1.3 Proposed Design Features Intended to Reduce Impacts

This section describes design features incorporated into the proposed project to reduce environmental impacts associated with the Terminal. Plans for the Terminal would concentrate development within two rail loops, allowing major portions of the project area to remain unaltered.

5.1.3.1 *Offshore Wharf and Trestle Structure*

Deep pile foundations would be required to support the high loads of the trestle and wharf. Previous geotechnical analyses had assessed geotechnical conditions of the seabed and design requirements for the trestle and wharf foundations. Lymon C. Reese & Associates (1993) reported that a number of small-diameter piles in clusters (pile groups) or a single large-diameter pile could support the trestle and wharf foundations. The depth of pile penetrations to sustain the axial loadings that would occur is expected to be approximately 60 feet or less. For large-diameter single piles, open-ended steel tube is preferred. Pile installation with a vibrator hammer should be considered.

Ben C. Gerwick, Inc. (1993) reviewed the Lymon C. Reese & Associates (1993) report and commented that pile penetration to a depth of about 80 feet would be necessary for large-diameter single piles, but this depth of penetration could be reduced with more detailed information and analysis. Ben C. Gerwick, Inc., also concluded that installation of the piles by driving and jetting using a Vulcan 560 hammer would be reasonable.

5.1.3.2 *Onshore Structures and Site Development*

Large, heavily loaded foundations would transfer loads to the soft, compressible glaciomarine drift. Possible design features to reduce impacts could include founding heavily loaded structures on deep foundations such as piles.

Large areas of fill and embankments would be prone to settlement resulting from consolidation of the soft clayey soil that makes up the glaciomarine drift underlying the site. As noted by GeoEngineers (1997), these settlements would occur over an extended period, with 50 to 90 percent of the total

settlement occurring gradually over a period of 1 to 3 years, and remaining settlement occurring continuously over a period of many years. Therefore, preloading alone is not considered an effective option.

The clay and silty to sandy clay composing the glaciomarine drift is considered a “poor” to “bad” railway roadbed subgrade. To mitigate this condition, over-excavation of the roadbed subgrade to depths of up to 5 feet should be anticipated, with the removed surface layer replaced with properly compacted structural fill. Prior to placing the structural fill on the cut subgrade, placement of a regular or heavy-duty geotextile fabric should be anticipated to provide separation between the native subgrade and structural fill.

To minimize settlement in areas anticipated to receive fill and embankments, the design will require a number of potential mitigative strategies. Those presented below are possible alternatives that could be considered for site development. Actual mitigative measures would be determined by the project geotechnical engineer, civil engineer, and structural engineer during final design.

Lightweight Fill

Lightweight fill can consist of a variety of materials, including geofoam, lightweight aggregate, wood chips, shredded rubber tires, and other materials. Lightweight fills are used rather infrequently for large areal fills, due to relatively high costs or other disadvantages, such as the limited bearing capacity of fill-supported structures when using these materials.

Subgrade Improvement

Subgrade improvement using compacted stone columns or aggregate piers beneath the planned fill embankments can be used to minimize settlement. These methods, though, can have relatively high costs and are generally used only when placing fill embankments that support critical structures.

Avoidance

Since secondary compression is expected to continue for many years, critical structures and site features should not be placed on large fill embankments. After the fill embankment is constructed, settlement would occur continuously over time, and periodic maintenance would be required to maintain planned site grades and drainage. Placement of a geogrid between the native soils and fill embankments would aid in minimizing the effects of differential settlements across the fill embankment, but it would not minimize overall settlement.

The ongoing geotechnical review will produce updated evaluation with more specific design specifications needed to construct stable pile structures.

5.2 UPLAND VEGETATION, WILDLIFE, AND HABITATS

This section describes the upland biological resources in the project area and provides an assessment of potential environmental effects of the Terminal on upland vegetation, wildlife, and habitat. While the focus of this section is terrestrial biological resources, some of the species discussed utilize wetland, marine, and/or riparian habitats at times, and references to these habitats are included here. Marine and wetland resources are discussed in detail in Section 5.3.

This section includes an evaluation of potential effects on State Priority Habitats and Species listed by the WDFW, and on federally listed species. This section also identifies potential mitigation measures designed to limit impacts. Additional details on the proposed mitigation are presented in Section 5.4.3. The information presented in this section is based on information published in the 1996 Gateway Pacific Terminal Draft EIS, literature reviews, and field investigations conducted in 2006-2010.

Key issues of concern related to upland vegetation, wildlife, and habitats include:

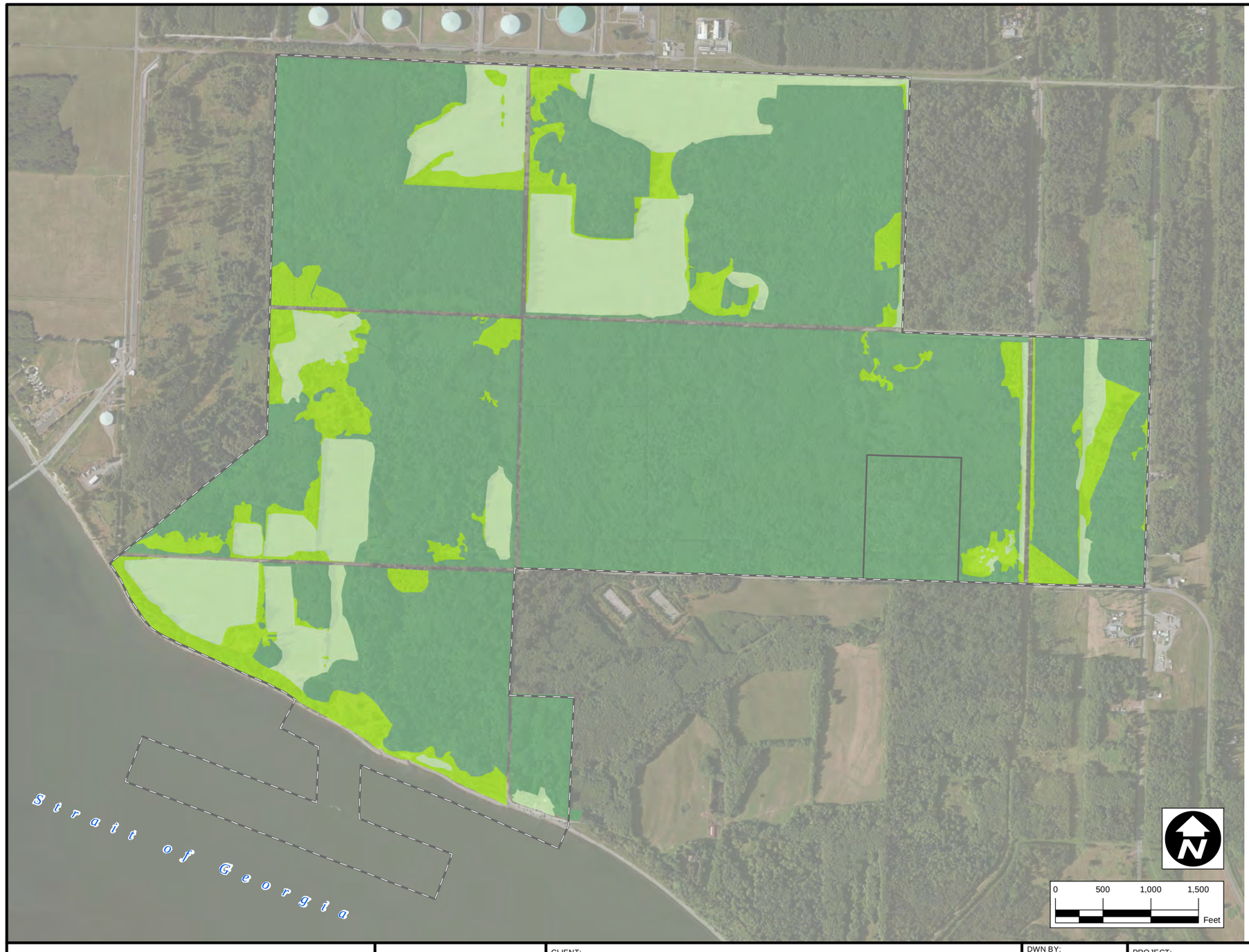
- Displacement of upland vegetation and habitats by Terminal infrastructure and
- Direct mortality and disturbance to state threatened, endangered, and priority species and habitats.

5.2.1 Affected Environment

This section describes existing upland biological resources in the project area, including vegetation, wildlife, habitat, and listed and protected species. More studies are underway to better understand the upland vegetation, wildlife, and habitats.

5.2.1.1 *Vegetation and Habitat*

A map of vegetation communities at the Terminal is shown in Figure 5-3. Terrestrial habitat quality at the project site is generally marginal, and the habitat is fragmented into blocks of approximately 20 acres by paved roads. A number of habitat types are present at the Gateway Pacific Terminal site, including riparian communities (along Stream 1 and Stream 2), deciduous forests, shrub communities, pasture, hayfields, and nearshore habitat, including a coastal lagoon. Terrestrial habitats are described below. The nearshore community and coastal lagoon are described in detail in Section 5.3.



LEGEND

VEGETATION TYPE:

- EMERGENT (184.10 acres)
- FOREST (831.20 acres)
- SHRUB (108 acres)
- PROPERTY BOUNDARY
- PROJECT AREA BOUNDARY

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CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

DWN BY: SD
CHK'D BY: KD
DATUM: NAD83
PROJECTION: WA SP North, Ft.
SCALE: 1 inch = 1,100 feet

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: EXISTING VEGETATION TYPES

DATE: MACRH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: 1
FIGURE NO.: FIGURE 5-3

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 5-3 - Existing Vegetation Types.mxd

Terrestrial and wetland habitats across the project area have similar vegetation in many locations. Vegetation in forested areas consists primarily of deciduous species—red alder (*Alnus rubra*)[1] and black cottonwood (*Populus balsamifera*)—and infrequent individual western red cedar (*Thuja plicata*) or Douglas-fir (*Pseudotsuga menziesii*) trees. Overall, forested stands represent several different forest management events. Generally, the oldest and largest trees are found near riparian corridors. Some small areas have tree species that were probably planted when the area had farms with yards.

Most of the forested areas have a dense understory of shrubs—vine maple (*Acer circinatum*), common snowberry (*Symphoricarpos albus*), salmonberry (*Rubus spectabilis*), Indian plum (*Oemleria cerasiformis*), clustered rose (*Rosa pisocarpa*), and red elderberry (*Sambucus racemosa*)—and forested wetlands with red osier dogwood (*Cornus sericea*), willows (*Salix* spp.), and twinberry (*Lonicera involucrata*). Where present, the herbaceous layer is dominated by sword fern (*Polystichum munitum*), bracken fern (*Pteridium aquilinum*), and Pacific blackberry (*Rubus ursinus*). Piggyback plant (*Tolmiea menziesii*), soft rush, and slough sedge are present in the forested wetland areas.

Dense thickets of Nootka rose (*Rosa nutkana*) and Himalayan blackberry (*Rubus armeniacus*) are common along forest and pasture boundaries and roadsides. Patches of shrub wetlands are present throughout the project area and are commonly dominated by Nootka rose, Douglas spirea (*Spiraea douglasii*), and Himalayan blackberry.

Vegetation in hayfields that are seeded and hayed annually consists of grasses and forbs, including red fescue (*Festuca rubra*), bentgrass (*Agrostis* spp.), sweet vernalgrass (*Anthoxanthum odoratum*), common velvetgrass (*Holcus lanatus*), and English plantain (*Plantago lanceolata*). In less frequently managed pasture areas, dominant grass species include red fescue, meadow foxtail (*Alopecurus pratensis*), Canadian thistle (*Cirsium arvense*), bentgrass, quackgrass (*Agropyron repens*), and orchardgrass (*Dactylis glomerata*). Mowing occurs annually along power line and pipeline easements and promotes thick stands of reed canarygrass (*Phalaris arundinacea*).

Whatcom County describes riparian areas as zones where aquatic and terrestrial ecosystems interact, including both marine and freshwater areas (Parametrix and Adolfson 2005). Riparian vegetation is important for providing habitat for fish, birds, and amphibians. Along Stream 1, especially in the reaches south of Lonseth Road (Reaches 1 and 2), riparian vegetation provides a variety of habitat functions, such as shade, bank stability, sediment/nutrient filtering, and organic nutrient input. The value of riparian vegetation in the marine environment at the site is limited due to the steep bluff near the project footprint. However, the vegetation along the bluff provides habitat for birds foraging in the nearshore.

1 Plant species names are according to the NRCS PLANTS Database (USDA, NRCS 2012).

5.2.1.2 *Wildlife*

Terrestrial animal communities in the project area include resident and migratory birds, mammals, amphibians, and reptiles. An extensive literature search was conducted to identify the presence and abundance of terrestrial mammals, amphibians, and reptiles in the project area, and intensive field investigations were conducted in 2008 and 2009 to document the bird species that inhabit the project area.

A search of the WDFW Priority Habitats and Species (PHS) database did not identify the potential for any federally- or state-recognized threatened, endangered, or priority mammal, amphibian, or reptile species to occur in the project area.

This section describes the terrestrial wildlife species that may use the project area, including birds, mammals, and amphibians and reptiles.

Birds

The Gateway Pacific Terminal site includes forest, shrub and open areas (pastures and hayfields), riparian areas, and marine/nearshore habitats suitable for a variety of bird species. Bird surveys were conducted in 2008 and 2009 to identify birds present at the project area. Birds identified included year-round resident species, seasonal migrants, and migrating birds using the site as a stopover area.

American robins were the most abundant species detected during the non-breeding season, followed by song sparrows, black-capped chickadees, and winter wrens. Song sparrows were the most abundant species detected during the breeding season, followed by American goldfinches, American robins, and savannah sparrows. Species detected most often during the surveys are habitat generalists adapted to a variety of environments and generally tolerant of human presence and other types of disturbance.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-712 §703) established federal responsibility for the protection of nearly all species of migratory birds and their eggs and nests. A migratory bird is any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle.

Under the MBTA, it is illegal to “take” migratory birds or their eggs, feathers, or nests. The MBTA defines “take” to include any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof. More than 800 species of migratory birds are currently protected under the MBTA. Protection of nests by the MBTA includes only nests with eggs and/or young.

Barn swallows, brown-headed cowbirds, common yellowthroats, harlequin ducks, olive-sided flycatchers, orange-crowned warblers, Pacific-slope flycatchers, red-breasted mergansers, rufous hummingbirds, savannah sparrows, Swainson's thrushes, and warbling vireos were observed in a variety of habitats in the project area during the breeding season, and were presumed to be breeding in the project area (Table 5-3). Western tanagers and Swainson's thrushes were limited to riparian areas, warbling vireos were limited to forested areas, common yellowthroats were limited to shrub areas, and barn swallows and brown-headed cowbirds were limited to the hayfield adjacent to the shoreline.

Non-migratory Birds

A list of non-migratory birds identified during field surveys is provided in Table 5-4. The numbers of individual birds detected for some year-round resident species, such as American goldfinch, olive-sided flycatcher, orange-crowned warbler, Pacific-slope flycatcher, rufous hummingbird, and savannah sparrow, were higher during the breeding season than during the non-breeding season. This is likely the result of either an increased abundance of birds during the breeding season where suitable breeding habitat exists, or higher rates of detection due to increased bird vocalizations associated with breeding.

Non-migratory birds were generally present in all habitats in the project area, with a few exceptions. Northern harriers were found only in riparian areas; golden crowned kinglets, hairy woodpeckers, Hutton's vireos, pileated woodpeckers, and red-winged blackbirds were identified in the forests; merlins were only found in shrub communities; Cooper's hawks and red-tailed hawks were observed in the pasture and hayfields; and pelagic cormorants were found in the nearshore.

Amphibians and Reptiles

Although frequent rain and the mild climate of the Pacific Northwest create an excellent environment for amphibians, the local habitats on the project site are limited in their suitability to many amphibian species. Based on range and distribution maps, 10 species of amphibians could occur near and within the proposed Gateway Pacific Terminal site. Many of the species are associated with mature and old growth coniferous forests that provide downed logs and other debris for abundant hiding cover (Nussbaum, et al. 1983, Leonard, et al. 1993). The absence of old-growth forests in the project area reduces the number of species that may occur at the site. Because most of the site is vegetated by young deciduous forest, pastures, and hayfields, and because the site lacks large woody debris on the ground for refugia, habitat for amphibians is limited. Wetland areas throughout the site provide the most potential habitat for breeding and rearing of pond-breeding amphibians that may also utilize shallow inundation, such as the northwestern salamander (*Ambystoma gracile*) and Pacific tree frog (*Pseudacris regilla)*.

Table 5-3 Migratory Bird Species Identified in the Project Area

Common name	Scientific name[1]	Migratory status	Habitat Type
barn swallow	*Hirundo rustica*	Breeding	Hayfield (bluff above nearshore)
Barrow's goldeneye	*Bucephala islandica*	Non-Breeding	Hayfield (bluff above nearshore), Nearshore
brown-headed cowbird	*Molothrus ater*	Breeding	Hayfield (bluff above nearshore)
common goldeneye	*Bucephala clangula*	Non-Breeding	Nearshore
common loon	*Gavia immer*	Non-Breeding	Nearshore
common yellowthroat	*Geothlypis trichas*	Breeding	Shrub
cormorant species	*Phalacrocorax* spp.	Migratory	Hayfield (bluff above nearshore), Nearshore
harlequin duck	*Histrionicus histrionicus*	Breeding	Hayfield (bluff above nearshore), Nearshore
herring gull	*Larus argentatus*	Non-Breeding	Nearshore
horned grebe	*Podiceps auritus*	Non-Breeding	Hayfield (bluff above nearshore), Nearshore
loon species	*Gavia* spp.	Migratory	Hayfield (bluff above nearshore), Nearshore
olive-sided flycatcher	*Contopus cooperi*	Breeding	Hayfield (bluff above nearshore), Pasture, Shrub
orange-crowned warbler	*Vermivora celata*	Breeding	Pasture, Riparian, Shrub
Pacific-slope flycatcher	*Empidonax difficilis*	Breeding	Pasture, Riparian, Forest, Shrub
red-breasted merganser	*Mergus serrator*	Breeding	Nearshore
ruby-crowned kinglet	*Regulus calendula*	Non-Breeding	Riparian, Shrub
rufous hummingbird	*Selasphorus rufus*	Breeding	Pasture, Riparian, Forest
savannah sparrow	*Passerculus sandwichensis*	Breeding	Hayfield (bluff above nearshore), Nearshore, Pasture, Shrub
surf scoter	*Melanitta perspicillata*	Non-Breeding	Nearshore
Swainson's thrush	*Catharus ustulatus*	Breeding	Riparian
unidentified gull	family *Laridae*	Migratory	Hayfield (bluff above nearshore), Nearshore, Pasture, Riparian, Forest
warbling vireo	*Vireo gilvus*	Breeding	Forest
western grebe	*Aechmophorus occidentalis*	Non-Breeding	Nearshore
western tanager	*Piranga ludoviciana*	Breeding	Riparian
willow flycatcher	*Empidonax traillii*	Breeding	Shrub
Wilson's warbler	*Wilsonia pusilla*	Breeding	Pasture
yellow warbler	*Dendroica petechia*	Breeding	Pasture, Riparian, Forest
yellow-rumped warbler	*Dendroica coronata*	Breeding	Hayfield (bluff above nearshore), Pasture, Riparian

1. Species names are according to Seattle Audubon Society's Birdweb (Audubon 2012).

Table 5-4 Non-Migratory Bird Species Identified During Field Investigations

Common name	Scientific Name[1]	Habitat Type
American crow	*Corvus brachyrhynchos*	Nearshore, Riparian, Forest
American goldfinch	*Carduelis tristis*	Nearshore, Pastures, Riparian, Forest, Shrub
American robin	*Turdus migratorius*	Forest, Shrub
Anna's hummingbird	*Calypte anna*	Upland meadow (bluff above nearshore), Forest
bald eagle	*Haliaeetus leucocephalus*	Hayfield (bluff above nearshore), Nearshore, Pastures, Riparian, Shrub
Bewick's wren	*Thryomanes bewickii*	Hayfield (bluff above nearshore), Pastures, Forest, Shrub
black-capped chickadee	*Poecile atricapillus*	Pastures, Riparian, Forest, Shrub
brown creeper	*Certhia americana*	Pastures, Riparian, Forest
bushtit	*Psaltriparus minimus*	Pastures
chestnut-backed chickadee	*Poecile rufescens*	Pastures, Riparian, Forest, Shrub
Cooper's hawk	*Accipiter cooperii*	Hayfield
dark-eyed junco	*Junco hyemalis*	Nearshore, Forest, Shrub
golden-crowned kinglet	*Regulus satrapa*	Forest
great blue heron	*Ardea herodias*	Hayfield (bluff above nearshore)
hairy woodpecker	*Picoides villosus*	Forest
Hutton's vireo	*Vireo huttoni*	Forest
marsh wren	*Cistothorus palustris*	Hayfield, Riparian
merlin	*Falco columbarius*	Shrub
mourning dove	*Zenaida macroura*	Hayfield (bluff above nearshore), Nearshore, Shrub
northern flicker	*Colaptes auratus*	Hayfield (bluff above nearshore)
northern harrier	*Circus cyaneus*	Riparian
Pacific wren	*Troglodytes pacificus*	Riparian, Forest, Shrub
pelagic cormorant	*Phalacrocorax pelagicus*	Nearshore
pileated woodpecker	Dryocopus pileatus	Forest
pine siskin	*Carduelis pinus*	Riparian, Forest, Shrub
red-tailed hawk	*Buteo jamaicensis*	Pastures
red-winged blackbird	*Agelaius phoeniceus*	Forest
song sparrow	*Melospiza melodia*	Hayfield (bluff above nearshore) , Riparian, Forest
spotted towhee	*Pipilo maculatus*	Riparian, Forest
western gull	*Larus occidentalis*	Hayfield (bluff above nearshore), Nearshore

1. Species names are according to Seattle Audubon Society's Birdweb (Audubon 2012).

Field investigations conducted in 1993 identified four species of amphibian (two species of salamander and two species of frog) and one species of reptile, as well as large numbers of ranid (true frog) and tree frog tadpoles. The two species of salamander observed at the project site, the northwestern salamander and the long-toed salamander (*Ambystoma macrodactylum*), are widespread in western Washington, and occur from sea level to over 6,000 feet in elevation (Leonard, et al. 1993). Both the northwestern salamander and the long-toed salamander are pond breeders that commonly use subterranean refugia during summer and cold winter periods (Leonard, et al. 1993).

Similarly, the two species of frog observed at the site, the red-legged frog (*Rana aurora*) and the Pacific tree frog, are common in Washington State. Red-legged frogs occur primarily in terrestrial habitat, while the Pacific tree frog uses a wide range of habitats and can be found in ponds, woodlands, pastures, and meadows. Both species use inundated areas for breeding, where eggs are attached to submerged emergent vegetation.

Six additional amphibian species could possibly occur in the project vicinity. However, most of these species are not likely to be common to the area. Two species, the Pacific giant salamander (*Dicamptodon tenebrosus*) and western redback salamander (*Plethodon vehiculum*), are most commonly found in pure conifer forest habitat, which does not occur on the project site. The ensatina (*Ensatina eschscholtzii*) most commonly occurs under bark or other wood debris associated with mature forest habitat, which is lacking in the project area. The western toad frog (*Anaxyrus boreas*) may possibly occur on the site, because it is commonly found near marshes and small lakes, but it also can be found in terrestrial habitats (Leonard, et al. 1993; Nussbaum, et al. 1983). The rough-skinned newt (*Taricha granulosa*) may occur in the project area but was not identified during field investigations. The rough-skinned newt may be found in shallow water habitats and lay eggs on submerged vegetation. It is possible the newt inhabits areas adjacent to the coastal lagoon. The bullfrog (*Rana catesbeiana*), an introduced exotic species, is highly aquatic. If it occurs on the site, it would also likely be limited to the coastal lagoon at the mouth of Stream 1.

The one species of reptile identified during field investigations was the western terrestrial garter snake (*Thamnophis elegans*). The garter snake generally inhabits grassy or shrubby areas on the edges of water bodies. Individuals may be found in wetland areas, as well as stream edges, ponds, shrub areas, and lakes (Hallock and McAllister 2009).

None of the amphibians or reptiles observed at the site, or those possibly occurring on the project site, are listed as sensitive, threatened, or endangered by WDFW or the USFWS.

Mammals

Terrestrial mammals likely to occur at the Gateway Pacific Terminal site include those species typical of urban open-space. Raccoon, eastern gray squirrel, black-tailed deer, and coyote were all identified during various field investigations.

Federally Listed Threatened and Endangered Species

No upland species federally listed as threatened or endangered use the project area. Marbled murrelets may use the offshore portion of the site for foraging. A more detailed analysis of these issues will be provided in a Preliminary Draft Biological Evaluation.

Gray wolves are a federally listed threatened species under USFWS jurisdiction. Though occasional sightings of grey wolves have been reported in the state, no breeding pairs or packs of wolves are currently documented in the State of Washington. The Whatcom County Critical Areas Ordinance, Best Available Science Review describes gray wolves as rare visitors to North Cascades National Park. Sightings in the project vicinity reported by WDFW are likely to have involved lone wolves straying from Canada or wolf/dog hybrids that have been released into the wild (Parametrix and Adolfson 2005).

State Priority Habitats and Species

This section identifies the State Priority Habitats and Species that potentially use the project site. The WDFW PHS database identifies several bird species that inhabit the site area as State Priority Species.

Seven priority species were observed during field investigations conducted in 2008-2009 (Table 5-5).

None of the State Priority Species identified in the project area are listed as threatened or endangered by state or federal regulatory agencies. The only migratory State Priority Species identified during the breeding season was the harlequin duck. No nests were identified during the field investigation.

Four nearshore species (common loon, western grebe, great blue heron, and harlequin duck) and bald eagle use the project area for foraging in the marine environment. Bald eagles were identified perched on the bluffs above the nearshore area searching for potential prey and roosting in trees above the nearshore.

Table 5-5 WDFW Priority Species that may occur in Whatcom County

Common Name	Scientific Name	State Status	Federal Status	Habitat Type on-site
Common loon	*Gavia immer*	Sensitive	None	Nearshore
Western grebe	*Aechmophorus occidentalis*	Candidate`	None	Nearshore
Great blue heron	*Ardea herodias*	None	None	Nearshore
Harlequin duck	*Histrionicus histrionicus*	None	None	Nearshore
Bald eagle	*Haliaeetus leucocephalus*	Sensitive	Species of Concern	Bluff above the nearshore and riparian areas
Merlin	*Falco columbarius*	Candidate	None	Shrub communities
Pileated woodpecker	*Dryocopus pileatus*	Candidate	None	Riparian

Source: WDFW 2010

Merlins were identified in shrub communities and pileated woodpeckers were identified in forested communities, primarily in the riparian corridor.

A great blue heron nesting rookery is located approximately 1 mile north of the proposed project site, east of Birch Bay State Park (WDFW 2012). Studies conducted by BP indicate that foraging areas for great blue heron include marine shorelines, intertidal zones, wetlands, streams, riparian areas, and upland fallow fields. The most concentrated foraging during the nesting season occurs in the intertidal areas nearest the colony (WDNR 2010), north of Point Whitehorn, approximately 1.5 miles from the proposed Terminal.

5.2.2 Potential Effects on Upland Vegetation, Wildlife, and Habitat

This section describes the potential effects of the proposed Terminal on upland vegetation, wildlife, and habitats.

5.2.2.1 *Construction Related Effects*

Construction may affect upland vegetation, wildlife, and habitats through changes to the surface and vegetation, construction noise, and other effects. This section describes the effects of construction on upland vegetation, wildlife, and habitats.

Vegetation and Habitat

Construction of the Terminal would remove vegetation and soil from the project footprint. It is anticipated that the conversion of vegetation communities would be permanent. Temporary vegetation disturbance would occur in an area estimated to be 20 feet beyond the final footprint to allow maneuvering during construction. This area would be restored following construction.

Vegetation communities that would be displaced by project construction include 224 acres of forested habitat, 36 acres of shrub habitat, and 69 acres of pasture and hayfields (Figure 5-4).

No federal or state endangered, threatened, or sensitive plant species occur within the onshore portions of the Terminal, and therefore none would be affected by construction of the proposed project.

Loss of vegetation would affect all species using the vegetation as habitat. The effects of the project, and loss of vegetation on wildlife, are described below.

Wildlife

Construction of the Gateway Pacific Terminal would result in direct habitat loss as described above. Indirect effects would include increased fragmentation by rail embankments and other project infrastructure. Impacts to habitat would displace wildlife species that currently depend on the habitat. It is assumed that most mobile wildlife species, such as birds and larger mammals, would move away from areas of disturbance and would colonize nearby suitable habitats. However, it is possible that nearby habitats would not be able to satisfy the needs of additional animals, resulting in the loss of some individuals. Most small mammals, amphibians, and reptiles would be directly affected by construction due to limited mobility, resulting in a loss of some individuals of these species.

Most of the bird species identified during field investigations appear to be habitat generalists, using a variety of the habitat types that occur on site, with some exceptions, as described in Section 5.2.1. Species using exclusively the riparian community associated with the lower reaches of Stream 1 (migrating western tanagers and Swainson’s thrushes and resident northern harriers) are not likely to be affected by construction of the terminal, as no construction activities would occur in the riparian corridor.

Bird species using portions of the project area that would be directly affected by construction would likely be temporarily or permanently displaced due to the loss and/or alteration of breeding and foraging habitats and increased habitat fragmentation. Specifically, species using the hayfield above the nearshore community (Barrow's goldeneye, common goldeneye, common loon, harlequin duck, herring gull, horned grebe, loon species, red-breasted merganser, western grebe, great blue heron, and western gull) would likely be temporarily displaced during construction due to noise and general disturbance. These species are expected to resume use of the area following construction.

Abandonment of nesting sites and the loss of eggs or young could also occur, especially by birds nesting in the forested community during clearing of the site. Seventeen species of migratory birds were identified in the Terminal project area during the breeding season (Table 5-3). Although nesting

birds were not recorded, it is possible that any of these species could be nesting in the project area, and would be disturbed if construction were to occur during the nesting season.

Effects on mammals would include the loss and/or alteration of breeding and foraging habitats and increased habitat fragmentation. Mortality would likely also occur to less mobile species.

The proposed project would displace 12,814 linear feet of streams and ditches that could provide habitat for amphibians, although these are either in pastures or roadside drainages and do not have high quality habitat.

Federally Listed Threatened and Endangered Species

No federally listed threatened or endangered mammal, amphibian, or reptile species are known to occur within the project footprint, and thus none would be displaced by the Terminal.

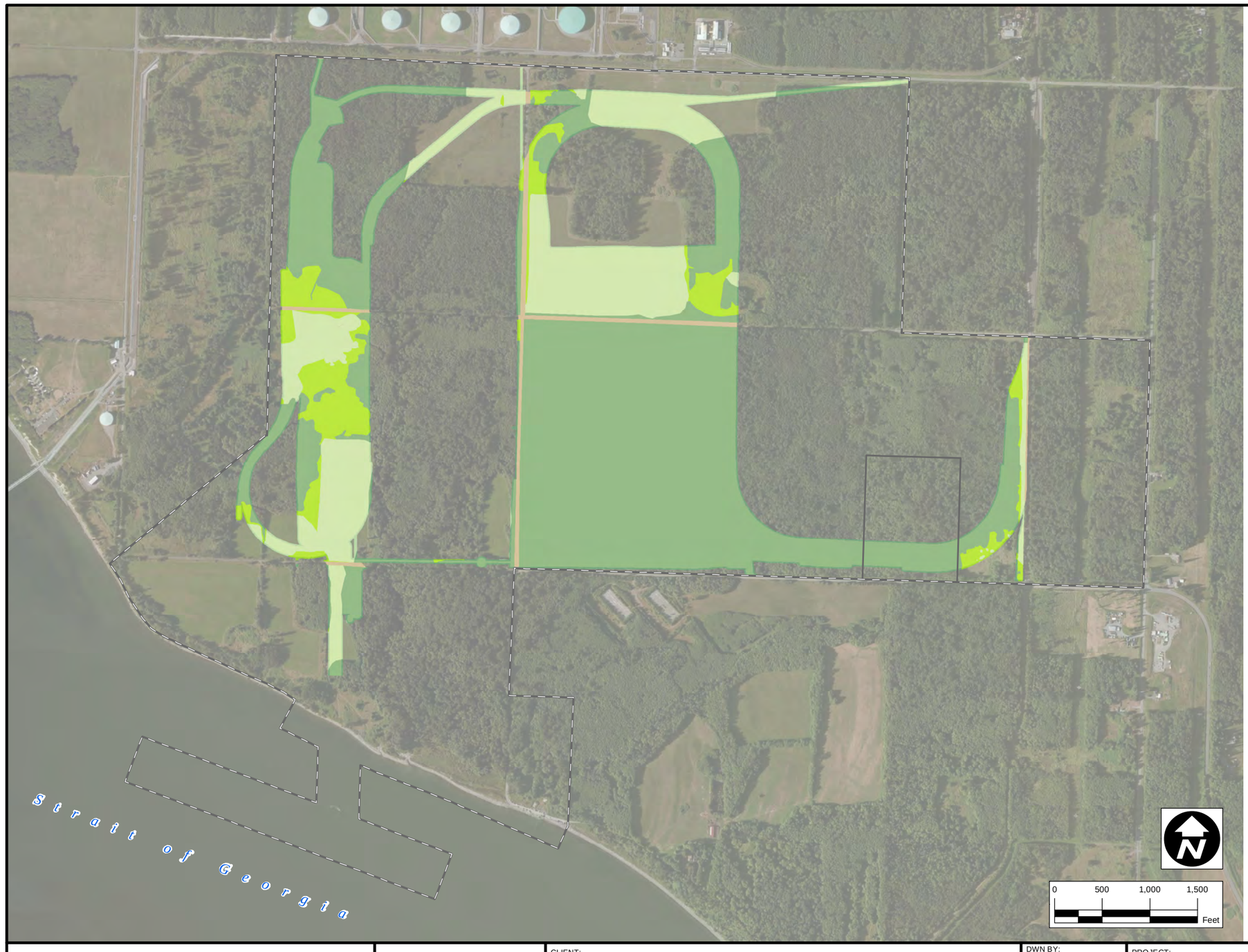
State Priority Habitats and Species

Effects of the construction of the Terminal on common loon, western grebe, great blue heron, and harlequin duck would be similar to those described for marbled murrelets in the marine resources section (Section 5.3). These species would likely be disturbed during construction of the terminal.

Merlins were identified primarily in shrub communities. It is possible that merlins would be displaced during construction of the proposed project. However, similar existing habitat at the Gateway Pacific Terminal project site would not be disturbed during development, and this would likely provide adequate alternative habitat away from the proposed project footprint.

Ultimately, the project would result in a net improvement in habitat for pileated woodpeckers and other species using the riparian corridor. Pileated woodpeckers were identified using the riparian area of Stream 1's lowest reach. No Terminal construction activities would occur within the riparian area. Restoration activities in the riparian area are proposed as part of the overall Terminal mitigation plan to improve habitat.

The nearshore bird species (common loon, western grebe, great blue heron, and harlequin duck) that may use the project site for foraging in the marine environment would also likely be displaced during construction, with effects similar to those described for marbled murrelets in the Marine Resources section (Section 5.3). None of the nearshore bird species were identified nesting in the project area during the 2008-2009 bird surveys, so breeding is not anticipated to be disturbed.



LEGEND

VEGETATION IMPACT AREA (348.05 acres):

- EMERGENT (82.76 acres)
  (Permanent: 76.5 acres)
  (Temporary: 6.26 acres)
- FOREST (233.87 acres)
  (Permanent: 219.27 acres)
  (Temporary: 14.6 acres)
- SHRUB (31.42 acres)
  (Permanent: 29.62 acres)
  (Temporary: 1.8 acres)
- UNVEGETATED
- PROPERTY BOUNDARY
- PROJECT AREA BOUNDARY

Pacific International Terminals
A Cermix Enterprise

CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

DWN BY: SD
CHK'D BY: KD
DATUM: NAD83
PROJECTION: WA SP North, Ft.
SCALE: 1 inch = 1,100 feet

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: VEGETATION IMPACTS: PROPOSED ACTION

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: 1
FIGURE NO.: FIGURE 5-4

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 5-4 - Map of Vegetation Types - Proposed Action.mxd

5.2.2.2 *Operational Effects*

This section describes effects that could potentially arise at the Terminal due to operational activities, such as commodities handling.

Vegetation and Habitat

Other than the aforementioned construction-related effects, operation of the Terminal would not affect existing vegetation communities. Long-term vegetation maintenance plans would be developed along with the proposed wetland mitigation and facilities maintenance plans.

Wildlife

Operation of the proposed project is not anticipated to adversely affect bird, terrestrial mammal, or amphibian species if appropriate mitigation and best management practices are applied. Wildlife species have coexisted with the adjacent BP Cherry Point Refinery for over 30 years and a similar response is anticipated for the proposed project.

Federally Listed Threatened and Endangered Species

No federally listed upland threatened or endangered species would be affected by the operation of the Terminal. A more detailed analysis of these issues will be provided in a Preliminary Draft Biological Evaluation.

State Priority Habitats and Species

As described above, it is anticipated that the priority species identified in the project area would be displaced during construction. Bald eagles displaced during construction would be unlikely to return to their nesting sites once they are displaced and would instead find new, alternative nesting sites. Merlins displaced during construction may continue to use the Terminal area after construction or may occupy new habitat at proposed wetland mitigation sites or elsewhere. The pileated woodpeckers identified in the project area would likely continue to use the Terminal site, especially the restored riparian corridors, after construction. The nearshore birds identified using the project area (common loon, western grebe, great blue heron, and harlequin duck) would be predicted to resume foraging in the marine environment once facility construction was complete and operation of the facility began.

5.2.3 Proposed Design Features Intended to Reduce Impacts

Impacts to songbird breeding and foraging habitat would be mitigated at the proposed wetland mitigation sites. The need to preserve and improve existing priority habitats for birds was identified as a primary objective of the Terminal wetland mitigation design, and mitigation areas within the Terminal property were selected and designed to expand upon and/or protect priority habitats, especially riparian areas.

If land clearing were to occur during the breeding season, a qualified biologist would first survey the affected area. If field surveys identified nests, or if other evidence of nesting were observed, a protective buffer (the size depending on the habitat requirements of the species) would be delineated, and the entire buffer area would be avoided to prevent destruction or disturbance to nests until the nests were no longer active.

5.3 MARINE RESOURCES

The proposed Terminal would be located in an industrial area along the marine waterfront, and would include a marine trestle and wharf that would be constructed in the nearshore environment. The marine trestle and wharf could have potential effects on marine resources during both construction and operation.

The Cherry Point area is recognized by the State of Washington as an aquatic reserve, with an environment that balances multiple unique features, including important natural habitats and deepwater access for industrial use. The herring stock found there has supported important commercial fisheries in the past and is an important resource for local Native American Tribes. The Cherry Point nearshore area also supports other fish species, marine mammals, and marine birds.

5.3.1 Affected Environment

This section describes the existing marine environment at the Gateway Pacific Terminal site. A more detailed analysis of the proposed Terminal on threatened and endangered and priority species will be provided in the Preliminary Draft Biological Evaluation. Key resources include the marine habitat and characteristic species, including salmon and herring. This section begins with a description of the nearshore marine physical processes, since the physical structure plays a key role in shaping habitat for marine biota.

5.3.1.1 *Marine Physical Process and Bathymetry*

Oceanographic features, such as waves, currents, and sediment transport, characterize physical conditions of the habitat. Westmar Consultants, Inc., (Westmar 1996) developed preliminary data on key physical characteristics of the nearshore marine environment at the site. A follow-up study is currently underway to generate additional data on physical conditions. These data will be used to refine the engineering design of the wharf and to evaluate the potential effects of the proposed Terminal on littoral drift and sediment transport.

Currents at the project site include both wind- and wave-induced currents, and tidal currents in deeper water. Tidal currents near the project area range from 0.7 to 1.0 feet per second flowing to the northwest during flood tide and to the southeast during ebb tide. Wind-induced currents include a drift

current in the direction of wind waves. In addition, waves approaching the shoreline give rise to a longshore current parallel to shore (Westmar 1996).

Sediment at the beach near the project area consists of cobble overlying gravel and coarse sand. Sediment characteristics in deeper water (below -13 feet relative to mean lower low water [MLLW]) are dominated by sand and mud (Shapiro & Associates 1996). Because of the relatively large sediment sizes at the site, sediment transport tends to occur as bedload (rolling, sliding, or bouncing along the bottom) rather than as sediments suspended in the water (Westmar 1996). Most open ocean beaches undergo seasonal changes due to changes in swell conditions. During calm conditions typical of the summer months, wave action moves sediment shoreward to build up the beach face. During storm activity typical of the winter months, the beach profile is generally lowered as sand is moved offshore to a bar that forms near the breaker zone. In addition, the longshore current causes a general movement of sand parallel to the beach. This movement of sediment transported by the longshore current is termed *littoral drift*.

The bathymetry along the Cherry Point shoreline in the proposed project area is unique in that it provides water depths of more than 70 feet relatively close to shore, thereby allowing access for large vessels without the need to dredge shipping channels or berthing areas. Nearshore water depths within the project vicinity range from 0 to -100 feet below MLLW.

5.3.1.2 *Marine Biological Communities*

The nearshore marine community is unique in providing direct functional interaction between upland and marine habitats. In this document, the nearshore marine community is defined as the transition from upland habitat to marine habitat in waters to a depth of-100 feet relative to MLLW, the deepest water within the proposed project area. Underwater video was taken to document and characterize the marine biological communities throughout the entire project area. Maps generated from the underwater video analysis will be provided in the Marine Biology Baseline Inventory Report (AMEC 2012a). The following description of the affected environment provides information about nearshore communities in the Pacific Northwest, and previous studies specific to the Cherry Point area.

Nearshore marine communities are classified by depth or *vertical zonation* (Figure 5-5). These classifications consist of:

1. the backshore (supralittoral) zone extending from the base of the bluffs to the mean higher high water (MHHW) mark;
2. the intertidal (eulittoral) zone, from MHHW to -3 feet below MLLW;
3. the shallow subtidal zone, from -3 feet to -16 feet below MLLW; and

4. the deep subtidal zone, below -16 feet below MLLW (Figure 5-5).

The proposed Terminal footprint extends into all of these classes of nearshore community. The project area also includes a coastal lagoon south of the proposed development footprint.

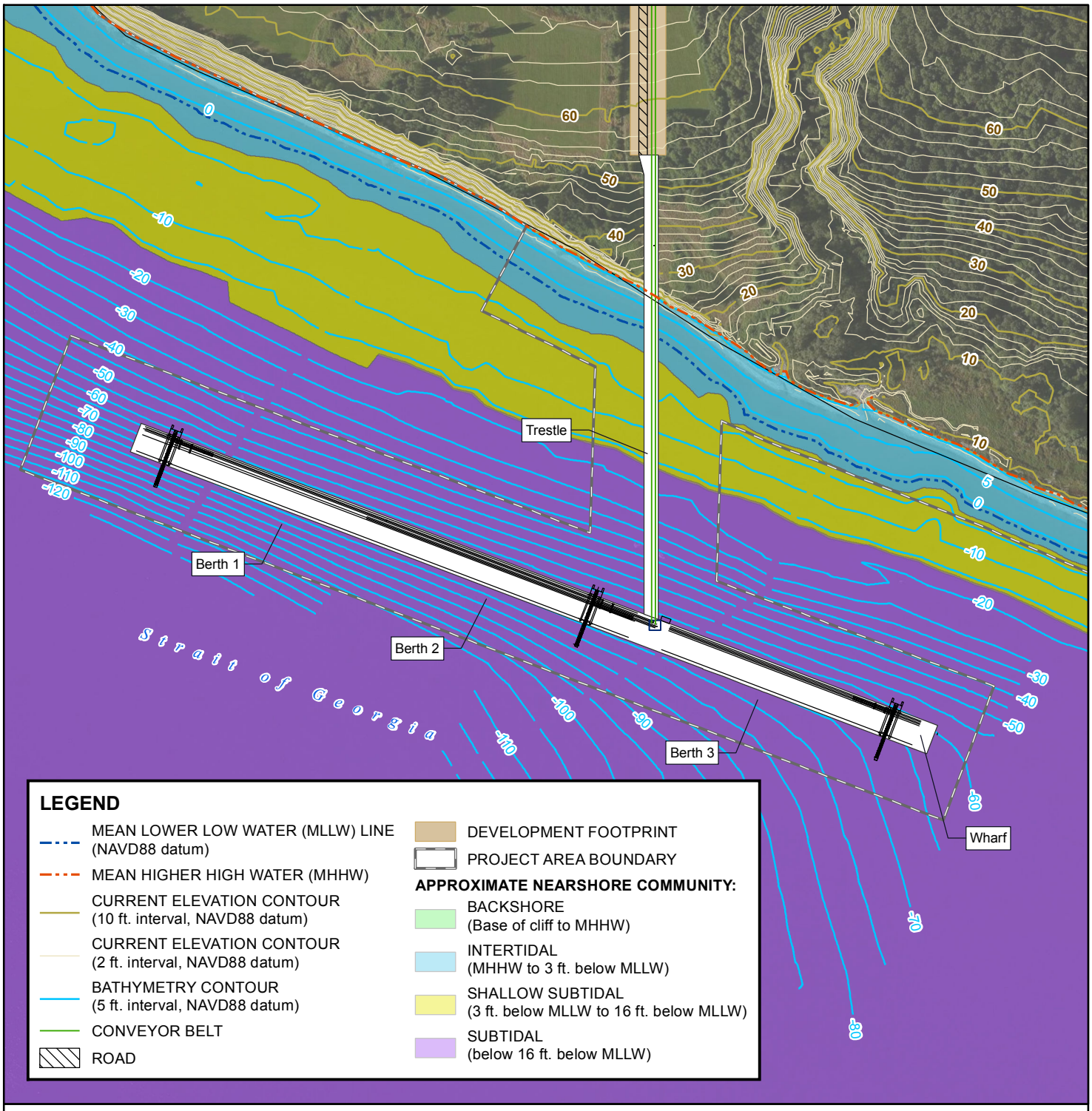
The Backshore

The shoreline in the vicinity of the project area is characterized by mostly flat to gently sloping terrain on the uplands with steep bluffs bordering the westernmost 2,500 feet of beach. Only extreme storm-driven tides inundate the backshore. Wood accumulates in the backshore through transport at extreme high tides. The woody debris that accumulates along the shoreline in the project area helps to stabilize the shoreline and provides microhabitats for invertebrates and birds.

A portion (11.17 acres) of the backshore at the project area, west of Gulf Road, is characterized as a *coastal lagoon*, a “shallow coastal water body separated from the ocean by a barrier, connected at least intermittently to the ocean by one or more restricted inlets” (Kjerfve 1994). Coastal lagoons are formed and maintained through sediment transport processes. Sediment carried by rivers, waves, currents, wind, and tides accumulates in river and tidal deltas, on marshes and flats where submerged aquatic vegetation slows currents, and on washover fans. Lagoon barriers are constantly eroded by waves and wind, requiring continuous sediment deposition to maintain them (Bird 1994).

Coastal lagoons are highly productive ecosystems. They contribute to the overall productivity of coastal waters by supporting a variety of habitats, including salt marshes and sea grasses, and they provide habitat for fish and shellfish species. Because of the low flushing rate of lagoons, they may be favorable habitats for primary producers such as phytoplankton and aquatic plants. Furthermore, nutrients are transported to lagoons from surface water and groundwater flows and through exchange with the ocean. Because nutrient availability often limits primary productivity, coastal lagoons can foster high rates of primary production, thereby supporting high rates of secondary production compared to other aquatic ecosystems (Nixon 1995).

The coastal lagoon within the project area serves as nursery and feeding habitats for a variety of organisms (Heck and Thoman 1984). Vegetation includes emergent vegetation adapted to brackish conditions, including fat-hen saltbush, saltgrass, pickleweed, salt marsh dodder, arrowgrass, and Pacific silverweed. Other species present include Sitka spruce, Douglas spirea, and Nootka rose. The coastal lagoon has salt-affected, organic-rich soils.



Source:
Ausenco Sandwell, 143166-A100-WC001-1.dwg (Rev. P1), 12/22/2011.
David Evans & Associates, svTPXpiti0006-DEGROSS.dwg, 01/16/2012.
David Evans & Associates, svEM02piti0006-Tide Topo.dwg, 02/23/2012.

0 250 500 1,000 Feet

N

Pacific International Terminals

CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: EXISTING CONDITIONS NEARSHORE COMMUNITIES

DWN BY:	DATUM:	DATE:
SD	NAD83	MARCH 2012
CHK'D BY:	REV. NO.:	PROJECT NO.:
KD	1	091515338C-18-01
PROJECTION:	SCALE:	FIGURE No.:
WA SP North, Ft.	1 inch=500 feet	FIGURE 5-5

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 5-5 - Existing Conditions - Nearshore Communities.mxd

The Intertidal Community

The intertidal community includes those species that live between the low and high tide lines (MHHW to -3 feet below MLLW). The intertidal zone is exposed at low tide and underwater at high tide. Organisms living in the intertidal zone have a highly variable environment and have evolved various adaptations specific to these conditions. The intertidal community is characterized by vertical zonation, where the community is divided into distinct bands of species at different levels along the shore.

The intertidal community in the project area is described as a rocky intertidal community: the shoreline has a hard bottom substrate, with a species community and distribution that is influenced by behavioral, morphological, or physiological adaptations to this substrate (Somero 2002). The rocky shoreline at the project site has substantial wave action, and species have evolved adaptations to allow individuals to cling tightly to the rocks. Additionally, organisms living in the high intertidal zone must cope with a large range of temperatures. While organisms are underwater during high tide, temperatures vary little. However, when organisms are exposed to the elements at low tide temperatures may dip to below freezing or become extremely hot for a few hours. While mobile organisms, such as crabs, snails, and worms, can avoid temperature fluctuations by moving into cool, moist refuges (such as under rocks) during low tide, sessile organisms, such as mussels and anemones, are dependent on coping mechanisms. Finally, the intertidal community is characterized by limited space, resulting in intense competition among species for attachment and refuge substrates. An investigation of clams inhabiting the marine intertidal community was conducted in 2011. Species identification and approximate distribution will be provided in a separate report (AMEC 2012a).

Shapiro & Associates (now AMEC Environment & Infrastructure, Inc. [AMEC]) surveyed macroalgae along the existing shoreline of the project area on two occasions, including an aerial survey in 2005 and a detailed macroalgae distribution survey in the 1990s. In 2007, AMEC biologists qualitatively assessed the nearshore habitat, using means including snorkel surveys, to plan the macroalgae habitat enhancement site that is proposed to mitigate nearshore habitat impacts. In general, the species community was consistent with conditions reported from 1992 to 1993 (Shapiro & Associates 1996). A more recent underwater video survey and quantitative survey of macroalgae were conducted in 2011. The results of that investigation, including explicit mapping and species identification, will be provided in a separate document (AMEC 2012a).

Shapiro & Associates (1996) reported that marine vegetation in the upper intertidal zone between +2 and -2 feet MLLW is dominated by *Ulva* spp. and *Porphyra* spp., with a narrow band of *Fucus* and *Gigartina* between -2 and -3 feet MLLW. Below -2 feet MLLW, kelp beds are characterized by a diverse assemblage of red and brown algae, such as *Sargassum* spp., *Cryptopleura* spp., *Laminaria*

spp., *Nereocystis* spp., and *Iridaea* spp. The invasive brown alga, *Sargassum muticum*, colonizes cobble and rocky substrates in lower intertidal and shallow subtidal habitats of Cherry Point. The rapid growth of this alga, along with its ability to reproduce in a single season, allows it to establish itself quickly. Once established, *Sargassum* reduces abundance of native algae by shading. Since being introduced to Whatcom County waters less than 50 years ago, *Sargassum muticum* is now present on more than one third of the County's shoreline. Observations in the Birch Point and Cherry Point areas have shown continued expansion in the range of *Sargassum muticum* (Kyte 2004).

A sparse patch of eelgrass was observed in the 1990s, beginning more than 50 feet west of the centerline of the proposed Gateway Pacific Terminal trestle (where sparse is defined as no more than 8 stems per 0.25 square meter) (Shapiro & Associates 1996). The patch became dense at a distance of 75 to 100 feet west of the centerline of the proposed trestle. During more recent investigations, no eelgrass was identified near the proposed trestle (AMEC 2012a). During recent field investigations, the eelgrass bed nearest to the proposed Terminal occurred to the north, several hundred feet south of the BP Cherry Point Refinery pier. As required under the Settlement Agreement (1999), a macroalgae and eelgrass investigation will be completed within 2 years of trestle and wharf construction to confirm site conditions.

No eelgrass is present in the area that would be under the proposed wharf, as the water is too deep to support an eelgrass community. Previous studies conducted in Puget Sound have reported the maximum depth of eelgrass as -21.3 feet MLLW (Gaeckle 2009).

The intertidal community also includes organisms living on or under the bottom sediments. These organisms constitute the benthic fauna or *infauna*. Annelid worms, burrowing anemone, amphipods, and a variety of clams—including those sought after by recreational clam diggers, such as cockles, native littleneck clams, and butter clams—dominate the intertidal infauna at the Terminal site.

Shallow Subtidal Community

The shallow subtidal community (ranging from -3 to -16 feet MLLW) in the project area is characterized by kelp beds that provide a unique three-dimensional habitat for marine organisms. Kelp beds in the project area are composed primarily of brown algae belonging to the taxonomic order Laminariales. Kelp is considered the fastest growing organism in the world. During the summer, kelp beds throughout Puget Sound can increase in length by as much as about 3 inches per day and produce approximately 20 pounds of biomass per square yard in 3 months (Thom 1981). Kelp beds provide important refuge habitat for a number of fish species, especially rockfish. Juvenile and sub-adult salmon have also been known to use kelp bed habitats.

Additional surveys and mapping of macroalgae in the shallow subtidal community were conducted in 2011 and will be provided in a separate report (AMEC 2012a).

The Subtidal Community

Below -16 feet MLLW, the substrate is dominated by sand and mud and provides limited ecological diversity. Diver surveys conducted in 1992 to 1993 revealed that no algae are found below -16 to -20 feet MLLW, the depth zone that marks the beginning of the sand and mud substrate (Shapiro & Associates 1996).

Subtidal invertebrates characteristic of the Cherry Point reach include seastars, red rock crabs, small shrimp, and infauna species, such as polychaetes and small clams (EVS 1999). The deeper, soft mud habitat is characterized by a sparse epifauna (aquatic animals living atop the seafloor), which includes sea pens, nudibranchs, Dungeness and tanner crabs, and small crangonid shrimp. The infauna is dominated by small sea cucumbers, as well as polychaetes, bivalves, burrowing anemones, and brittle stars. Additional data describing the density and distribution of benthic infauna, geoducks, and other subtidal invertebrates were collected in 2011, and will be presented in a separate report (AMEC 2012a).

Groundfish are fish species that live on, in, or near the seafloor. Groundfish that utilize Cherry Point include Dover sole (*Solea solea*), English sole (*Parophrys vetulus*), rock sole (*Lepidopsetta bilineata*), starry flounder (*Platichthys stellatus*), and Pacific and speckled sanddabs (*Citharichthys sordidus* and *C. stigmaeus*, respectively). Occasionally adult butter sole (*Isopsetta isolepis*) have been found, along with lingcod (*Ophiodon elongatus*) (Smith and Shull 2009). During the juvenile phase of their lives, many species of groundfish, such as lingcod and rockfish, use submerged aquatic vegetation for feeding, refuge from predators, and nursery (Mumford 2007). An analysis of available suitable habitat for rockfish and other groundfish species was conducted using underwater video. The results of the underwater video survey were mapped to show areas of suitable rockfish habitat, and will be presented in a separate report (AMEC 2012a).

Surveys conducted by Whatcom County (Fairbanks 2005) indicate that the submerged aquatic vegetation between the BP and Alcoa piers is dominated by large patches of low-density (1 percent to 50 percent plant cover) *Sargassum*, with smaller patches of low-density bull kelp, and isolated patches of low- and high-density eelgrass. Bull kelp potentially provides refuge habitat for a number of groundfish species, especially rockfish. The largest patch of bull kelp identified during the surveys conducted by Whatcom County lies north of the BP pier at Point Whitehorn (Fairbanks 2005). A small patch of bull kelp lies south of the proposed Terminal.

5.3.1.3 *Federally Listed Threatened and Endangered Species*

The Endangered Species Act (ESA) was established in 1973 to protect endangered species and their habitats. The ESA authorizes the NOAA Fisheries Service and USFWS to identify species that need to be protected, or listed, under the ESA. Species listed by the NOAA Fisheries Service and USFWS that occur in the vicinity of the Strait of Georgia are listed in Table 5-6 and Table 5-7, respectively.

Table 5-6 Federally Listed Species that Could Occur Near the Strait of Georgia Identified by NOAA Fisheries Service

Name	Scientific Name	Evolutionarily Significant Unit (ESU)	Federal Status
Chinook salmon	*Oncorhynchus tshawytscha*	Puget Sound	Threatened
steelhead trout	*Oncorhynchus mykiss*	Puget Sound	Threatened
humpback whale	*Megaptera novaeangliae*	North Pacific Ocean	Endangered
killer whale	*Orcinus orca*	Southern Resident Population	Endangered
Steller sea lion	*Eumetopias jubatus*	Eastern Distinct Population Segment	Threatened
leatherback sea turtle	*Dermochelys coriacea*	Pacific Ocean	Endangered
bocaccio	*Sebastes paucispinis*	Georgia Basin	Endangered
canary rockfish	*Sebastes pinniger*	Georgia Basin	Threatened
yelloweye rockfish	*Sebastes ruberrimus*	Georgia Basin	Threatened

Table 5-7 Federally Listed Species that Could Occur Near the Strait of Georgia Identified by the USFWS

Name	Scientific Name	Population Segment	Federal Status
bull trout	*Salvelinus confluentus*	Coastal/Puget Sound	Threatened
marbled murrelet	*Brachyramphus marmoratus*	California/Oregon/Washington	Threatened

NOAA Fisheries has also identified Coho salmon (*Oncorhynchus kisutch*), Puget Sound/Strait of Georgia distinct population segment (DPS) as a species of concern, but Coho are not protected under the ESA at this time. A more detailed biological description of each of the species will be provided in the Preliminary Draft Biological Evaluation for the proposed Gateway Pacific Terminal, which is currently under development.

5.3.1.4 *State Priority Habitats and Species*

WDFW defines *priority species* as those that require protective measures for their survival due to their population status; sensitivity to habitat alteration; or recreational, commercial, or tribal importance. *Priority habitats* are areas with unique habitat features, or habitat features of significance to a diverse assemblage of species. Marine species identified as State Priority Species that occur along the Whatcom County shoreline area are summarized in Table 5-8. Priority habitat includes the nearshore area (classified by WDFW as Puget Sound Nearshore).

Table 5-8 Marine State Priority Species that Could Occur at the Gateway Pacific Terminal Site

	Common Name	Scientific Name	State Status	Federal Status
Forage Fish	Pacific herring	*Clupea pallasi*	Species of Concern	
	surf smelt	*Hypomesus pretiosus*	None	
	Pacific sand lance	*Ammodytes hexapterus*	None	
Salmon and Trout	bull trout/Dolly Varden	*Salvelinus confluentus*	Candidate	Threatened
	Chinook Salmon	*Oncorhynchus tshawytscha*	Candidate	Threatened
	chum salmon	*Oncorhynchus keta*	Candidate	Threatened
	coastal resident/sea-run cutthroat	*Oncorhynchus clarki clarki*	None	
	Coho	*Oncorhynchus kisutch*	Candidate	Species of Concern
	Kokanee	*Oncorhynchus nerka*	None	
	pink salmon	*Oncorhynchus gorbuscha*	None	
	rainbow trout/steelhead	*Oncorhynchus mykiss*	Candidate	Threatened
	sockeye salmon	*Oncorhynchus nerka*	Candidate	
Groundfish	Pacific cod	*Gadus macrocephalus*	Candidate	Species of concern
	Pacific hake	*Merluccius productus*	Candidate	Species of concern
	walleye pollock	*Theragra chalcogramma*	Candidate	Species of concern
	black rockfish	*Sebastes melanops*	Candidate	
	bocaccio rockfish	*Sebastes paucispinis*	Candidate	Endangered
	brown rockfish	*Sebastes auriculatus*	Candidate	Species of concern
	canary rockfish	*Sebastes pinniger*	Candidate	Threatened
	copper rockfish	*Sebastes caurinus*	Candidate	Species of concern
	greenstriped rockfish	*Sebastes elongatus*	Candidate	
	quillback rockfish	*Sebastes maliger*	Candidate	Species of concern
	redstripe rockfish	*Sebastes proriger*	Candidate	
	yelloweye rockfish	*Sebastes ruberrimus*	Candidate	Threatened
	yellowtail rockfish	*Sebastes flavidus*	Candidate	
	lingcod	*Ophiodon elongatus*	None	
	English sole	*Parophrys vetulus*	None	
	rock sole	*Lepidopsetta bilineata*	None	
	longfin smelt	*Spirinchus thaleichthys*	None	
Invertebrates	pinto abalone	*Haliotis kamtschatkana*	Candidate	Species of Concern
	butter clam	*Saxidomus giganteus*	None	
	native littleneck clam	*Protothaca abrupta*	None	
	Dungeness crab	*Cancer magister*	None	
	pandalid shrimp	*Pandalus* spp.	None	
	red urchin	*Strongylocentrotus franciscanus*	None	
Marine Mammals	Dall's porpoise	*Phocoenoides dalli*	None	
	gray whale	*Eschrichtius robustus*	Sensitive	
	harbor seal	*Phoca vitulina*	None	
	orca (Southern Resident killer whale)	*Orcinus orca*	Endangered	Endangered
	Pacific harbor porpoise	*Phocoena phocoena*	Candidate	

Source: WDFW 2010

This section provides a brief description of the State Priority Species that may use the marine nearshore in the vicinity of the proposed Terminal. A more detailed analysis of the proposed Terminal on federally listed threatened and endangered and priority species will be provided in the Preliminary Draft Biological Evaluation.

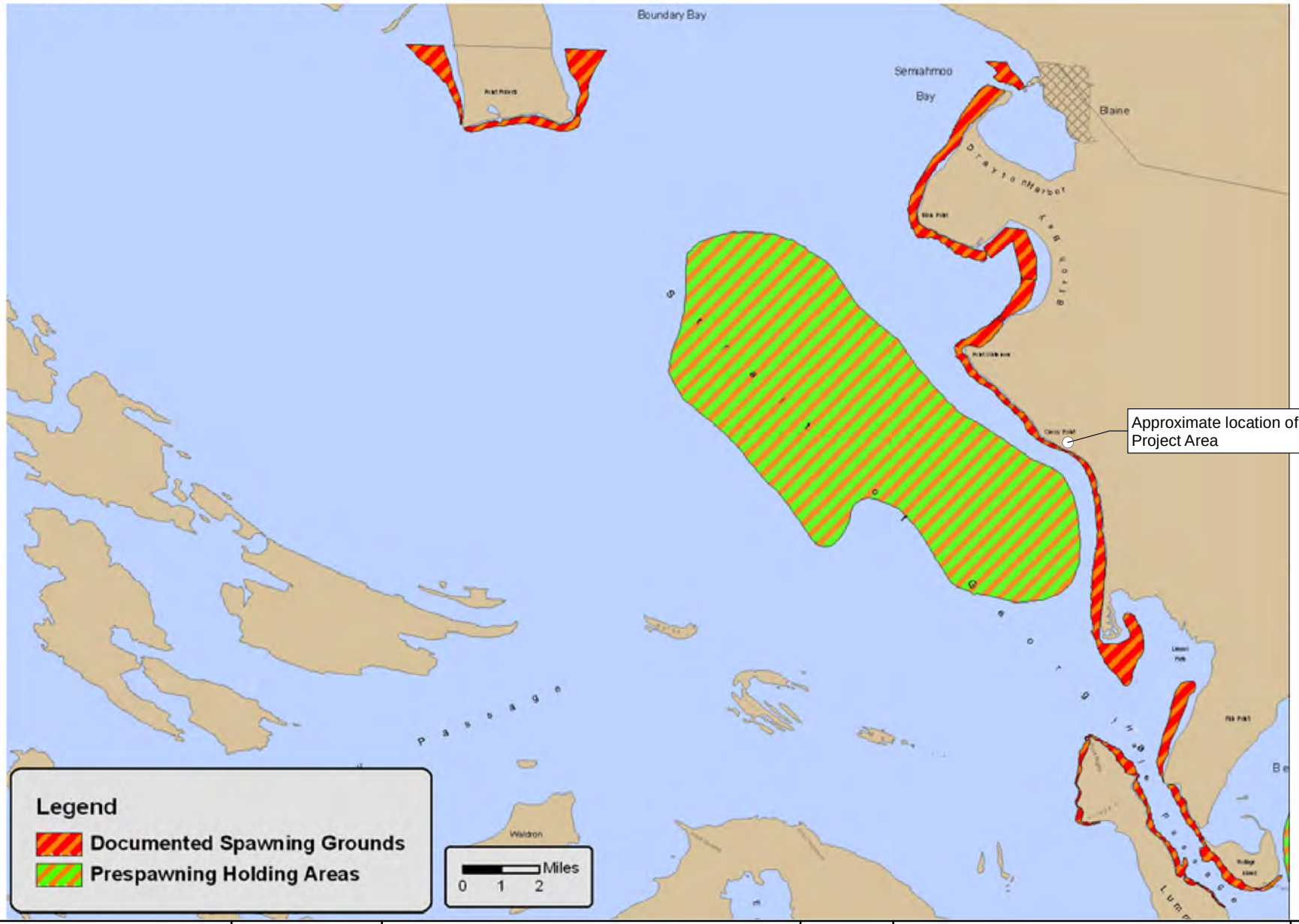
Forage Fish

Forage fish, including surf smelt, sand lance, and Pacific herring, are important prey fish for a variety of larger marine fish and marine mammals. Forage fish are known to spawn on intertidal beaches at Cherry Point; however, only herring are known to spawn near the project area, so only herring are described in detail herein. More information regarding known spawning locations for forage fish (sand lance and surf smelt) near and around Cherry Point will be provided in the Preliminary Draft Biological Evaluation (AMEC 2012b) for the proposed project, and in the Marine Biology Baseline Inventory Report (AMEC 2012a).

Herring

Pacific herring live in coastal waters, ranging along the Pacific Coast of North America from northern Baja California north to the Beaufort Sea, and in the Russian Arctic from the Chuckchi Sea in the east to the White Sea in the west. A large number of herring stocks, or metapopulations, and numerous occurrences of other more diverse, localized populations occur throughout the range of Pacific herring (Gustafson, et al. 2006).

Pacific herring at Cherry Point (Cherry Point herring) spawn from the end of March to mid-June, with peak spawning activity between the middle of April and the middle of May. WDFW studies have shown that herring form a pre-spawning aggregation (Trumble, et al. 1982) offshore, where ripening adult herring congregate and hold for 3 to 4 weeks prior to moving toward the spawning grounds on the inter- and subtidal areas of the beach to spawn. The presumed location of the pre-spawn holding area for Cherry Point herring is shown in Figure 5-6, which is based on WDFW publications regarding reports from fishermen (Stick and Lindquist 2009; O'Toole 2010). Egg deposition typically occurs between +3.0 feet MLLW and the lower limits of algal growth at around -20 feet MLLW, with most spawning occurring between 0 and -10 feet MLLW. Herring spawn on eelgrass and macroalgae species, including *Laminaria* spp. and *Sargassum muticum* (EVS 1999). Following spawning, eggs incubate for 10 to 14 days prior to emergence, after which time larvae drift in nearshore currents for 2 to 3 months before becoming juveniles.



SOURCE: Figure 2: Documented herring spawning grounds and presumed pre-spawning holding areas, *Cherry Point Herring Effects Analysis*, Washington Department of Fish and Wildlife, 2009.

Pacific International Terminals.

CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

DWN BY: SD
CHK'D BY: MG
DATUM: -
PROJECTION: -
SCALE: AS SHOWN

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: CHERRY POINT HERRING SPAWN AREA

DATE: MARCH 2012
PROJECT NO.: 091515338C-18-01
REV. NO.: -
FIGURE NO.: FIGURE 5-6

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 5-6 - Cherry Point Herring Spawn Area.mxd

Due to declines in abundance since 1973, a large number of studies have been conducted to evaluate Cherry Point herring since 1973. The first major study conducted to evaluate the cause of the decline in the Cherry Point herring stock was a Regional Risk Assessment (EVS 1999). Since then, two petitions have been filed to protect the population under the ESA. The petitions led NOAA Fisheries to appoint a Biological Review Team to conduct a status review of the species in 2001 (Stout, et al. 2001) and again in 2006 (Gustafson, et al. 2006).

Both the Regional Risk Assessment and status reviews identified and evaluated potential factors for the decrease in abundance of the Cherry Point herring stock. It is generally agreed that the decline was probably initiated by a periodic, recurring shift in climate that occurred in 1977 (known as the Pacific decadal oscillation), which coincides with the beginning of the population decline (Chavez, et al. 2003). Other factors that may have contributed to the decline in Cherry Point herring include physical stressors, such as temperature and salinity; biological stressors, such as lack of suitable food supply, competition, larval abnormalities, reduction in size at maturity, parasites, disease, and predation; and anthropogenic stressors, including fisheries harvest, habitat modification, vessel traffic, noise, contaminants, and ship ballast (Gustafson, et al. 2006). The 1999 *Cherry Point Screening Level Ecological Risk Assessment* (EVS 1999) determined that the current downward trend in the Cherry Point herring stock may be caused primarily by increased mortality of adults. Similarly, the 2001 status review of Pacific herring concluded that the decline in Georgia Basin herring was due to reduced recruitment of 3-year-old herring and to losses of older fish (Stout, et al. 2001). In 2004, most of the spawning population consisted of fish 3 to 5 years old, and there has been an apparent temporal decline in size-at-age of Cherry Point herring since 1973 (Gustafson, et al. 2006).

Predation is another potential explanation for the decline in Cherry Point herring. Pacific herring provide food for a multitude of species, including birds, fish, marine mammals, and benthic invertebrates. Bird predation is speculated to be the greatest source of egg loss, potentially resulting in egg mortality of 30 to 90 percent per spawning year (Taylor 1955). Seabirds have also been documented to graze heavily on intertidal plants covered with Pacific herring eggs, which may have contributed to the patchiness and zonation of eelgrass and macroalgae (Bayer 1980). Several species of fish are known to prey on Cherry Point herring, including ESA-listed Chinook salmon, with Pacific hake the most significant predator in open waters off the coast of Vancouver Island (EVS 1999). Similarly, Pacific herring make up 32 percent of the diet of harbor seals (Environment Canada 1998), the most abundant pinniped in Washington (Jeffries, et al. 1996). Recent studies show that herring pre-spawn holding areas appear to be important foraging habitat for harbor seals (Thomas, et al. 2009). Benthic marine invertebrates also prey on Pacific herring eggs, with egg loss due to predation by invertebrates estimated at 8 percent in British Columbia (Haegele 1993). Combined, predation by birds, fish, marine mammals, and benthic invertebrates places substantial pressure on the Cherry Point herring stock.

Food availability was evaluated as a cause of the decline (EVS 1999). Herring feed selectively on plankton during all life-history stages. Larval herring feed on copepods, invertebrate eggs, and diatoms. Juvenile herring feed on larger copepods and other invertebrates common in eelgrass beds, such as barnacle larvae and chaetognaths (Levings 1983). Adults feed on invertebrates, such as copepods, and small fishes. One of the principal food sources for Pacific herring is a large and nutritious calanoid copepod (*Neocalanus plumchrus).* It is documented that zooplankton biomass in the upper layer of the Strait of Georgia peaks in April through early June, and is dominated by *N. plumchrus.* Studies show that *N. plumchrus* went into a steep decline in the early 1970s, while populations of other, smaller copepod species increased (Gardner 1977). However, EVS (1999) determined that no overall correlation exists between food availability (chlorophyll *a* and invertebrate biomass) and recruitment to the Cherry Point herring stock. Therefore, food availability is not considered a current risk factor for Pacific herring populations.

Seasonal changes in temperature are important for regulating the timing of spawning migration and metabolic development rates of Pacific herring (Gustafson, et al. 2006). In addition, the 1999 Risk Assessment (EVS 1999) mentioned a relationship between temperature and increased predation on Cherry Point herring.

Habitat modification is another potential factor for the decline in Cherry Point herring. Herring spawn on intertidal vegetation, including eelgrass. While the decline of habitat, particularly eelgrass, at Cherry Point has been hypothesized as a factor for the decline in Cherry Point herring, the distribution and quantity of spawning substrate is subject to natural conditions, and thus varies yearly due to storms, natural littoral processes, and growth of eelgrass and macroalgae beds (Kyte 1999, 2000, 2001, 2002, 2003, 2004).

The existing marine structures at Cherry Point result in some shading of intertidal habitat, potentially resulting in some disruption of the spatial distribution of macroalgae. However, the degree of the impact depends on the vegetation type and the type of overwater structures. Field observations under overwater structures near Cherry Point show the potential for macroalgae to survive if hard substrate is available (Shapiro & Associates 1996). Other studies have shown that overwater structures result in some reduction in macroalgae and eelgrass growth (Gustafson, et al. 2006).

Whereas shading associated with overwater structures at Cherry Point may have resulted in some reduction in macroalgae and eelgrass, and thus some reduction in spawning area, experts agree that spawning substrate is not a limiting factor for Cherry Point herring (EVS 1999).

Groundfish and Schooling Fish

A number of groundfish listed as State Priority Species are likely to occur near the Terminal during the juvenile phase of their lives. They are most likely to occur near submerged aquatic vegetation for feeding, refuge from predators, and nursery (Mumford 2007). Bull kelp near the proposed Terminal potentially provides refuge habitat for a number of groundfish species, especially rockfish. A small patch that may provide habitat to groundfish species lies to the south of the proposed Terminal. The common habitat types and typical depth intervals for State Priority List groundfish species that may occur in the vicinity are provided in Table 5-9.

Table 5-9 Groundfish on the State Priority List that Could Occur near the Gateway Pacific Terminal Site

Species	Habitat Type	Common depth range
Pacific cod	Schooling species over soft or gravel substrate	150-900 feet
Pacific hake	Dense, mid-water schools	150-600 feet
walleye pollock	Schooling, mid-water to bottom-dwelling fish	300-900 feet
black rockfish	Relatively mobile, mid-water dwelling fish found in kelp beds and shallow reefs	40-300 feet
bocaccio rockfish	Adults in rocky areas, juveniles under dense kelp mats	150-1,000 feet
brown rockfish	Bottom dwellers living on hard bottom or sand, near structures (piers, oil platforms, etc.)	20-440 feet
canary rockfish	Found near the bottom, usually near pinnacles and sharp drop-offs	150-750 feet
copper rockfish	Near the bottom, over sand, near rock-sand interfaces. Not highly mobile.	20-60 feet
greenstriped rockfish	Solitary, found on mud, cobble or mud-rock interface	150-800 feet
quillback rockfish	On or near the bottom, living among rocks or on coarse sand or pebbles next to reefs in areas with flat-bladed kelp	40-250 feet
redstripe rockfish	Generally schooling, but sometimes isolated	70-150 feet
yelloweye rockfish	Solitary, occurring on or over rocky reefs	150-1,200 feet
yellowtail rockfish	Mid-water schooling fish found over rocky and hard bottoms, and occasionally over sand and mud.	300-450 feet
lingcod	Bottom dwelling, solitary in a variety of habitats including sand, gravel, and eelgrass beds.	0-200 feet
English sole	Soft bottom	150-900 feet
rock sole	Pebbly or semi-rocky bottom	0-300 feet
longfin smelt	Anadromous species	0-300 feet

Source: Love 1996

Marine Invertebrates

Representative invertebrate species that may be present at the Terminal site include Dungeness crabs, red urchins, butter clams, native littleneck clams, and pandalid shrimp. Pinto abalone is a priority species and has not been documented to occur at the site.

Dungeness crab spawn in the spring and larvae from the Puget Sound region may disperse as far as Alaska (Park, et al. 2007). This species is a carnivore that feeds on more than 40 different species, including small clams, oysters, fish, shrimp, and worms.

Red sea urchins are found in the intertidal to subtidal zone on seaweed, surfgrass, eelgrass, and rocks. There is a small commercial fishery for this species in the San Juan Islands, but not in the vicinity of the project site.

Adult and juvenile native littleneck clams are found in coarse, sandy-rock muds of the upper intertidal beaches of estuaries and on the open coast where appropriate substrate, detritus (decaying plant material), and protection from predators are present. Native littlenecks stay buried at a depth of around 8 centimeters due to their relatively short siphons (WSU 2007, Kegel 1998). Their siphons allow this species to gather food by filtering water for phytoplankton and diatoms. Rock crabs, fish, birds, and other predators feed on these clams depending on the region. Native littlenecks spend 2 to 3 weeks in the larval form (Shaw 1986).

Spot prawns, a species of pandalid shrimp, inhabit the deep sandy bottoms in the Rosario Strait area. They feed on crustaceans, polychaetes, limpets, and carcasses. The breeding season for spot prawns ends in late October, after which females carry their eggs on the abdomen for 4 to 5 months while remaining in deep water. The eggs hatch in March or April, with the larvae settling a few months later in May and June. Juveniles feed in shallow water during summer, especially among *Agarum fimbriatum* and *A. clathratum* kelp. During their second fall (carapace length 2.8 centimeters), they become males, which they remain until they grow to 3.3-centimeter carapace length, at which time they become females. Females may mate only once, and they may not live longer than 4 years (O'Clair and O'Clair 1998)

Marine Mammals

Marine mammals included on the WDFW State Priority Species List that could occur in the nearshore waters at the Terminal site include Dall's porpoises, gray whales, harbor seals, Southern Resident killer whales (also protected under the ESA as described previously), and Pacific harbor porpoises. A more detailed analysis of the proposed Terminal on threatened and endangered and priority species will be provided in the forthcoming Preliminary Draft Biological Evaluation.

5.3.2 Effects of Construction on Marine Resources

5.3.2.1 *Marine Physical Processes and Bathymetry*

The Cherry Point shoreline's unique bathymetric contours provide deepwater access without the need to dredge berthing areas. Therefore, there would be no effect to the bathymetry due to construction of

the proposed wharf and trestle. The construction process is not anticipated to alter marine physical processes.

5.3.2.2 *Marine Biological Communities*

The footprint of the proposed marine wharf and trestle would be supported by steel piles. Construction and installation of the steel piles supporting the marine trestle would result in a direct loss of approximately 333 square feet of nearshore habitat, potentially displacing marine invertebrates. Similarly, the piles supporting the marine wharf would displace approximately 9,169 square feet of subtidal habitat.

A detailed description of the potential effects of the construction of the Terminal on marine biological communities, including an underwater noise analysis and conceptual construction methodologies, will be provided in the Preliminary Draft Biological Evaluation for the proposed project. Conceptual construction methodology indicates that the majority of construction would be based from barges anchored waterward of any submerged marine vegetation, minimizing potential effects on the nearshore environment.

5.3.2.3 *Federally Listed Threatened and Endangered Species*

The effects of the proposed project on ESA-listed species are currently under evaluation. A more detailed analysis of the proposed Terminal on threatened and endangered and priority species will be provided in the Preliminary Draft Biological Evaluation.

5.3.2.4 *State Priority Habitats and Species*

This section describes potential effects of project construction on State Priority Habitats and Species.

Forage Fish

Cherry Point herring are known to spawn in the project vicinity. The primary construction-related factor that may affect Cherry Point herring is underwater noise generated during pile driving. The effects of construction-related noise on ESA-listed fish species will be detailed in the Preliminary Draft Biological Evaluation (AMEC 2012b). However, pile driving would occur only when herring are not spawning during an in-water work window to be approved by WDFW. Therefore, construction of the proposed Terminal would not affect herring spawning behavior.

Surf smelt and sand lance may occur within the proposed project area, but they are not likely to spawn within the proposed project footprint. According to WDFW PHS data, the nearest surf smelt spawning events that have been recorded along the shoreline occurred approximately 3,250 feet southeast of the centerline the proposed trestle. According to the WDFW Salmonscape (WDFW 2012) mapping tool, surf smelt spawning was documented in this area southeast of the project footprint in

1992 and in 2003 (WDFW 2012). Previous data indicate that the peak timing of surf smelt spawning within the Action Area is during the first 3 weeks of July (pers. comm. between Brian Williams [WDFW] and Melinda Gray [AMEC] June 20, 2011). Based on WDFW data, previous investigations have not identified suitable habitat or previous sand lance spawning at the Terminal site (WDFW 2006, 2012). The nearest sand lance spawning beach is within the Action Area at the southern tip of the Lummi Peninsula, approximately 6 miles south of the proposed project site (WDFW 2012).

Groundfish

Groundfish are highly mobile and would likely avoid the area during construction. An underwater noise analysis will be provided in the Preliminary Draft Biological Evaluation.

Marine Invertebrates

Pile driving and construction activities would result in both temporary and permanent displacement of marine invertebrates. Benthic invertebrates in the footprint of the proposed support piles would be permanently displaced.

5.3.3 Effects of Operation on Marine Resources

This section describes potential effects of operation of the Terminal on marine resources. A more detailed analysis of the proposed Terminal on threatened and endangered and priority species will be provided in the Preliminary Draft Biological Evaluation.

5.3.3.1 *Marine Physical Processes and Bathymetry*

Westmar evaluated the potential effects of the proposed marine terminal on physical processes. Westmar evaluated energy reduction associated with the waves, as the waves propagate past rows of piles (Westmar 1996). Reflection and transmission of waves through the piles of the wharf and trestle were calculated to determine the effect of the waves passing through the rows of piles to the shoreline (Westmar 1996).

The study showed that waves from the south and southwest sectors would be reduced in height by approximately 1 percent, as measured at the contact with the shoreline. Waves from the west and northwest would be reduced by less than 0.1 percent, as measured at contact with the shoreline (Westmar 1996). For waves propagated parallel to the rows of piles (pile bents), relatively little reduction in wave height would occur, because the 30-foot span between pile bents is wide enough not to have much influence on wave height. However, when waves approach the wharf head more obliquely, they may need to propagate through several pile bents, creating greater potential for reduced wave height, and a corresponding reduction of wave energy.

The transmission coefficient for waves approaching from the south, southwest, west, and northwest was calculated using wave height, wave period, wave direction, pile diameter, pile spacing within each row, the length of each row, and the spacing between each row. The results indicate that waves from the south and southwest would be minimally attenuated by the piles, waves from the west would undergo a slight reduction, and waves from the northwest would be reduced even more, because the waves would need to propagate past many rows of piles (Westmar 1996).

The reduction in wave energy on the sheltered side of the wharf head is not expected to affect sediment deposition. Waves from the west would be most reduced in wave energy on the sheltered side of the wharf head. Taking into account the wave diffraction around the ends of the wharf head, wave heights at the shore would be somewhat reduced, resulting in some sediment accretion (Westmar 1996).

Additional data collection is ongoing, and analyses will be applied to understand further the potential alterations of hydrology (wave reduction by the wharf and trestle and increased energy from ship wakes) and sediment transport.

5.3.3.2 *Marine Biological Communities*

A detailed analysis of the proposed Terminal's effects (both during construction and operation) on the marine environment (including water quality, habitat, trophic interactions, non-native species, vessel traffic, and underwater noise) on threatened and endangered species will be provided in the Preliminary Draft Biological Evaluation. A brief explanation of anticipated effects is provided below.

The Backshore

The height of the trestle as it passes over the backshore would not likely interfere with vegetation growing in the marine riparian community. The proposed wetland mitigation would result in a net increase in coastal lagoon habitat south of the proposed Terminal.

The Intertidal and Shallow Subtidal Community

Effects on the intertidal and shallow subtidal communities are evaluated jointly because both communities are located within the photic zone, and thus operation of the proposed Terminal would have similar effects due to shading and habitat displacement associated with the footprint of support piles. Propeller wash from vessel traffic is not anticipated to affect aquatic vegetation at the Terminal because aquatic vegetation is not present in the deep water where vessels would be moored. Within the proposed mooring berths, the water ranges from -60 to -85 feet MLLW, beyond the limit of the photic zone. Similarly, moorage of large vessels would not affect aquatic vegetation due to the lack of vegetation in the deep water where the vessels would be moored.

A shading study was conducted in 1992 and 1993 to evaluate the effects of the proposed project on marine vegetation in the intertidal and shallow subtidal communities (Shapiro & Associates 1996). The model predicted the following effects:

- The shading influence from the trestle would be greatest within 10 feet of the center line of the trestle.
- Shading would decrease moving away from the center line of the trestle.
- At the outer edges of the trestle, the shading effect would be only 50 percent of the effect at the center line.
- No measurable shading would occur at a distance greater than 50 feet from the edge of the trestle.

In addition, the shade model (Shapiro 1996a) predicted that the greatest impact to the macroalgae community would be on intertidal species, and that subtidal species of *Laminaria* kelp would potentially persist because these species need lower levels of light for photosynthesis. Ultimately, the shade model (Shapiro 1996a) concluded that habitat potentially affected by shading would be limited to the area between -3 feet MLLW and +3 feet MLLW. The total area of anticipated shading impacts was estimated to be approximately 4,250 square feet (Shapiro 1996a).

Additional analyses are planned to evaluate the potential effects of the proposed structure on the marine environment. The study of the effects of physical processes, specifically sediment transport, will be applied to assess the potential impacts on intertidal and shallow subtidal invertebrates, particularly those adjacent to proposed pilings. Furthermore, if the physical process analyses identify potential accretion in sediment, the results of the analysis may be used to assess how changes in sediment characteristics may affect the benthic community.

Subtidal

Once constructed, the proposed Terminal would potentially provide additional habitat for reef-dwelling fish and Dungeness crabs (Nightingale and Simenstad 2001). The Terminal structure and associated vessel traffic could potentially affect migratory forage fish. The potential effects of the structure and vessel traffic will be described in the Preliminary Draft Biological Evaluation.

The Preliminary Draft Biological Evaluation for the project will also provide an analysis of deepwater habitat for rockfish and will discuss how the proposed Terminal would potentially provide additional habitat for reef dwelling fish.

5.3.3.3 *Federally Listed Threatened and Endangered Species*

A more detailed analysis of the proposed Terminal on threatened and endangered and priority species will be provided in the Preliminary Draft Biological Evaluation.

5.3.3.4 *State Priority Habitats and Species*

This section describes potential operational effects on State Priority Habitats and Species.

Forage Fish

While surf smelt and sand lance may occur within the proposed project area, they do not spawn in the vicinity of the proposed project, so they are not likely to be adversely affected by the proposed project.

The Preliminary Draft Biological Evaluation will provide an analysis of the potential effects of terminal operation on the potential limiting factors to Cherry Point herring, specifically, the effects of vessel traffic on the migration corridor of Cherry Point herring, the effects of the proposed trestle on marine vegetation (as spawning substrate), and the potential effects of noise (vessel traffic [operational noise] and construction-related noise).

Pacific herring respond to a variety of auditory inputs, including marine mammal echolocation sounds (Wilson and Dill 2002) and apparent production of endogenous sounds (Wilson, et al. 2003). Assuming that Pacific herring have a noise threshold of 75 dB and that vessels generally emit noise levels of 145 dB in the same frequency range (Gustafson, et al. 2006), Pacific herring would be able to detect the vessels. However, it is unknown whether the noise would disturb herring.

Studies indicate that short-duration, low-frequency sounds tend to produce startle responses in herring, while longer duration, high-frequency sounds produce avoidance responses, such as compacting of the school, sinking in the water, or leaving the area (Wilson and Dill 2002). A study of net-penned herring conducted by Schwarz and Greer (1984) suggests that large vessels approaching at a constant speed trigger an avoidance response in herring. Schwarz and Greer concluded that the temporal patterns of sound (magnitude, direction, and rate of change of amplitude) were the most important factors affecting the duration and intensity of herring response.

A small amount of herring spawning habitat (macroalgae) under the new trestle could be affected by shading. It is not known how important the proposed Terminal site is to the total success of herring spawning in the Strait of Georgia. However, availability of vegetation or suitable substrate does not appear to be limiting the areas that could potentially be used for spawning in the vicinity of Cherry Point (EVS 1999), as it appears that spawning substrate is currently underutilized. Furthermore, EVS (1999) determined that impacts at the egg or juvenile life stage do not account for the overall stock decline.

Marine Invertebrates

The proposed Terminal would displace any marine invertebrates within the footprint of structural piles. However, the proposed structure would provide shelter for crabs, and would potentially result in a net increase in Dungeness crab production (Nightingale and Simenstad 2001).

5.3.4 Proposed Design Features Intended to Reduce Impacts

Features intended to reduce impacts to marine resources include mitigation that would result in response to ongoing investigations, mitigation associated with impacts to wetlands, voluntary mitigation (removal of an abandoned creosote-pile conveyor), mitigation agreed to under the Settlement Agreement (1999), and implementation of best management practices (BMPs), as detailed below. Specific measures would include an enhanced macroalgae mitigation area (Figure 5-7) that will be described in the Preliminary Draft Biological Evaluation for the proposed project (AMEC 2012b), and removal of an existing overwater structure (Figure 5-8).

5.3.4.1 *Marine Physical Processes and Bathymetry*

Based on studies conducted by Westmar in 1996, the effects of the proposed project on marine physical processes would be negligible. Additional data are currently being collected to finalize the design and to minimize the effects on marine physical processes.

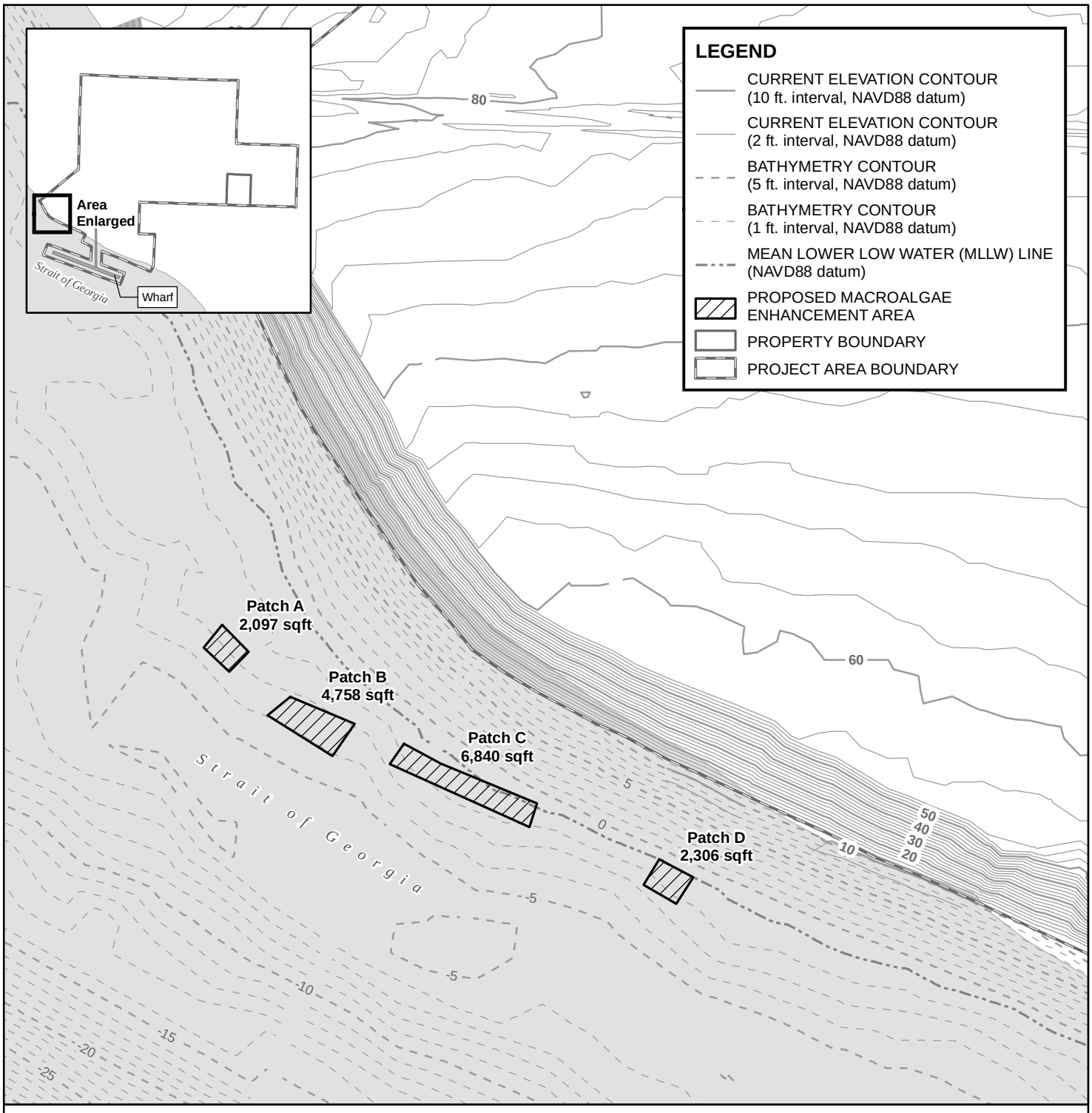
5.3.4.2 *Vessel Traffic and Moorage*

A vessel traffic analysis (VTA) is currently under development to model the impacts of vessel traffic resulting from operation of the Terminal. It will include an assessment of vessel moorage time for different types and sizes of vessels.

5.3.4.3 *Marine Biological Communities*

To compensate for impacts to marine biological communities, mitigation would follow the guidance of the Settlement Agreement (1999) in addition to the mitigation measures described below. A more detailed analysis of the proposed Terminal's effects on threatened and endangered and priority species will be provided in the Preliminary Draft Biological Evaluation.

As compensation for wetland impacts and general impacts to the backshore community, a coastal lagoon habitat would be constructed east of Gulf Road, adjacent to the existing coastal lagoon. The constructed coastal lagoon would provide functions similar to those provided by the existing coastal lagoon. Creation of the additional proposed coastal lagoon habitat would potentially provide enhanced primary productivity and increased connectivity between upland habitats and the Strait of Georgia (AMEC 2012a).



Source:
Ausenco Sandwell, 143166-A100-WC001-1.dwg (Rev. P1), 12/22/2011.
David Evans & Associates, svEM02piti0006-Tide Topo.dwg, 02/23/2012.

0 100 200 400 Feet

N

Pacific International Terminals

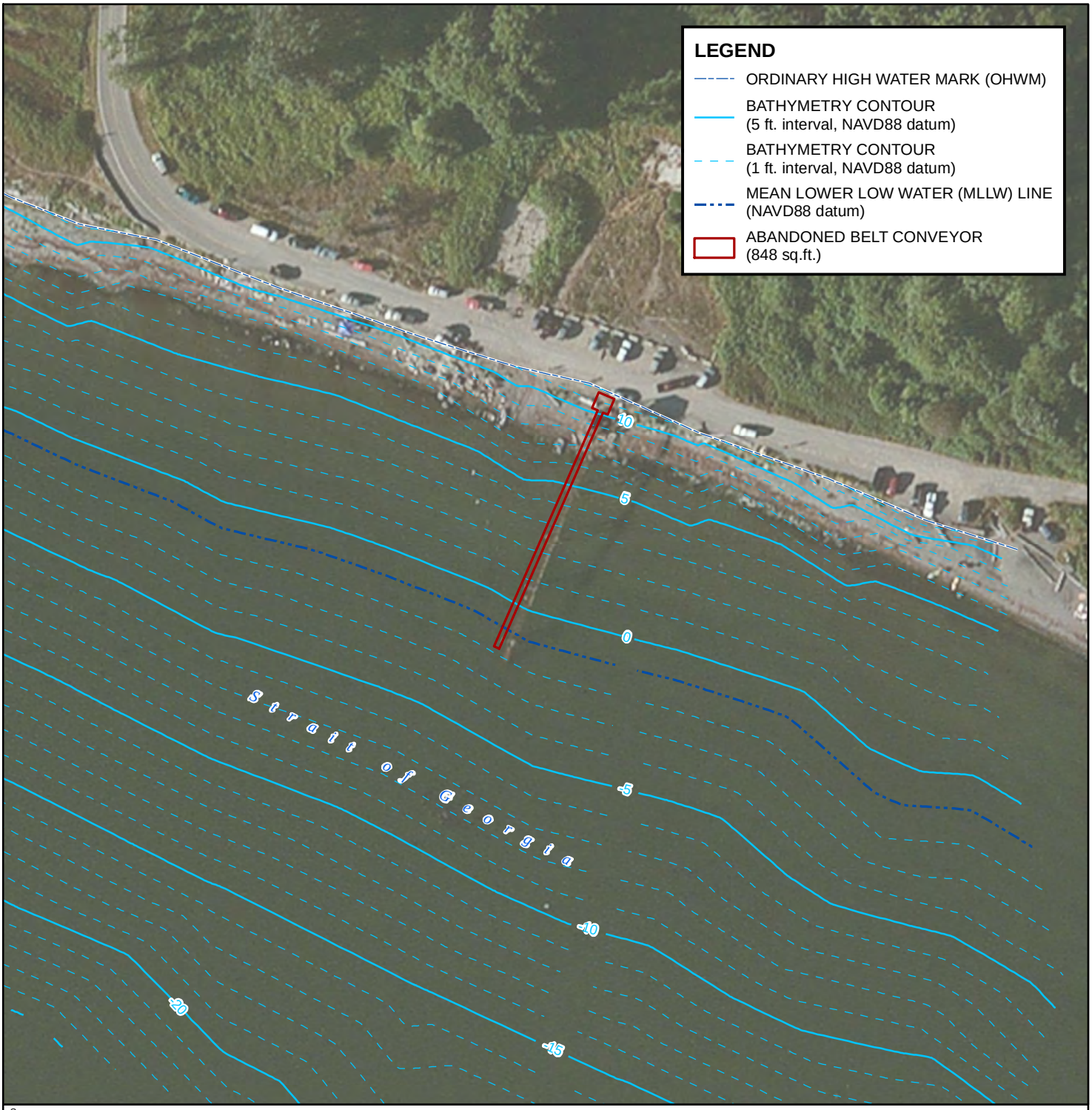
CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: MACROALGAE ENHANCEMENT AREA

DWN BY:	DATUM:	DATE:
SD	NAD83	MARCH 2012
CHK'D BY:	REV. NO.:	PROJECT NO.:
MG	1	091515338C-18-01
PROJECTION:	SCALE:	FIGURE No.:
WA SP North, Ft.	1 inch=200 feet	FIGURE 5-7

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 5-7 - MacroAlgae Enhancement Area.mxd



Source:
David Evans & Associates, svEM02piti0006-Tide Topo.dwg, 02/23/2012.
David Evans & Associates, 2010-07-14-svBSXpiti0006.dwg, 07/20/2010.

0 50 100 200 Feet

N

CLIENT:
PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: PHOTO OF ABANDONED BELT CONVEYOR TO BE REMOVED

DWN BY:	DATUM:	DATE:
SD	NAD83	MARCH 2012
CHK'D BY:	REV. NO.:	PROJECT NO.:
MG	1	091515338C-18-01
PROJECTION:	SCALE:	FIGURE No.:
WA SP North, Ft.	1 inch=100 feet	FIGURE 5-8

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 5-8 - Photo of Abandoned Belt Conveyor.mxd

To further reduce shading and improve water quality, Pacific International Terminals would remove an abandoned creosote-pile conveyor at the southern boundary of the Terminal property (Figure 5-8). The existing conveyor system extends offshore approximately 170 linear feet. Eight creosote piles support the conveyor structure, and four steel piles encased in concrete at the base support the metal hopper on the shore. The total area of the abandoned pier is approximately 850 square feet (Figure 5-8). Removal of the existing pier would result in a reduction of up to 850 square feet of overwater structure footprint in the nearshore, relative to existing conditions.

Additional impact avoidance and minimization measures, including an assessment of impacts, and strategies to minimize impacts to marine water quality will be provided in the Preliminary Draft Biological Evaluation for the proposed project.

5.3.4.4 *Threatened and Endangered Species and Priority Species*

A more detailed analysis of the proposed Terminal on threatened and endangered and priority species will be provided in the Preliminary Draft Biological Evaluation.

5.3.4.5 *Best Management Practices*

Best management practices would be developed and published in the Final Operations Plan for the facility. BMPs would include, among other management practices, plans for managing ballast water, implementation of a stormwater pollution prevention plan (SWPPP), and a marine spill avoidance and response plan.

During construction and operation of the facility, BMPs would be implemented for handling any material spills. In addition, state and federal requirements for managing stormwater discharge and all protocols to avoid vessel traffic collisions, interactions, and marine spills would be followed. If a catastrophic spill occurred, private, local, state, and federal response action plans would be implemented to minimize damage.

Ballast water is regulated by WDFW under RCW 77.120, which applies to all vessels of 300 English gross tons or more carrying ballast water into the waters of the state after operating outside of the waters of the state. All vessels using the Terminal would file a ballast water report form at least 24 hours prior to arrival into waters of the state. Discharge of ballast water into waters would be allowed only after a prior open sea exchange, or if the vessel has treated ballast water (WDFW 2010). The Settlement Agreement (1999) contains provisions regarding ballast water, and the parties to that agreement are currently discussing how to implement those provisions best.

Marine directional lighting would be used to minimize lighting impacts on the marine environment. To provide illumination for safe access along the conveyor walkways and transfer towers, lighting would

be provided using stanchion, ceiling, or wall-mounted 100-watt fixtures. Illumination for the working area on the shipping trestle and wharf would be provided by 400-watt floodlights mounted along the wharf conveyor.

5.4 LAND USE

This section describes existing land uses, the compatibility of the proposed project with adjacent land uses, and plans for future development of the project area, as defined by Whatcom County's Comprehensive Plan and zoning code. Because the project includes a proposed marine terminal constructed in state tidelands, compatibility with plans for management of tideland resources is also discussed. The main issues of concern for the proposed Terminal project relative to land use are:

- Assuring that construction and operation are compliant with zoning and land-use plans and standards, and
- Assuring that construction and operation do not adversely affect appropriate uses of adjacent lands.

5.4.1 Affected Environment

This section describes existing land uses near the proposed Terminal, and the applicable land-use plans for the Terminal site and vicinity.

5.4.1.1 *Existing Land Uses*

The project area is currently undeveloped and vegetated with red alder forest, pastures, hayfields, mowed utility corridors, and abandoned fields. Recent land uses have included pasture, hay farming, and firewood and pulpwood harvest. Pastures and hayfields are occasionally tilled and reseeded.

Neighboring properties include the BP Cherry Point Refinery immediately north and west; WDNR school lands; and a large, privately held parcel mainly on the south, currently used as pasture. The southern extent of the Strait of Georgia forms the south and southwestern boundary. The BNSF Railway's Custer Spur lies in the easternmost portion of the project area and includes the Elliot Rail Yard. Utility corridors include a buried petroleum pipeline and a high-power electrical line. Another nearby land use is the Lake Terrell State Wildlife Refuge to the east. The closest residential areas in proximity to the project area are located approximately 1.5 miles to the east, lying between the project area and the Wildlife Refuge.

Other industrial facilities in the vicinity include the ConocoPhillips Ferndale Refinery (approximately 2.5 miles to the southeast) and the ALCOA-Intalco Works (aluminum processing, approximately 1 mile to the southeast). The BP Cherry Point Refinery was constructed in 1971, the Intalco works in 1966, and the Ferndale Refinery in 1954, maintaining an industrial setting in the region for the past

50 years, which is consistent with the proposed Terminal. Each of the industrial facilities includes a pier extending into the Cherry Point reach of the Strait of Georgia. BNSF Railway is proposing improvements along the length of the Custer Spur. Land use adjacent to the existing right-of-way is largely rural, although businesses aligned with the main Cherry Point industries are present as well.

5.4.1.2 *Whatcom County Comprehensive Plan*

Whatcom County's Comprehensive Plan, first adopted in 1996 and last updated in January, 2010, is intended to guide growth in unincorporated areas of Whatcom County for the next 20 years in coordination with the updated master plans of the individual cities. The fundamental purpose of the Comprehensive Plan is to establish a framework of goals, policies, and action items for the more detailed growth planning and implementation actions that will occur in the near future in designated urban growth areas and in the county's rural areas.

Under Whatcom County's 2009 Comprehensive Plan update (Whatcom County 2010a), the project area is designated as part of the Major Port/Industrial UGA, which covers approximately 7,000 acres (Figure 5-9). The subarea plan includes goals and policies aimed at guiding future land-use policies, regulations, and, ultimately, development. All adopted regulations must be consistent with these goals and policies, and thus any development projects found to be consistent with the regulations are by default consistent with the goals and policies. Where development regulations have not been adopted, development projects must be found to be consistent with the goals and policies themselves.

Most of the goals and policies pertain to how the county will plan and/or develop regulations in the future, or have to do with non-industrial (for example, residential) development. Those intent statements, goals, and policies of the Comprehensive Plan that appear to be pertinent to the Gateway Pacific Terminal project, and a determination of consistency, are shown in Table 5-10.

5.4.1.3 *Zoning*

As shown on Whatcom County's zoning map, the uplands portion of the project area is designated HII (Figure 5-10) and is governed by Whatcom County Code (WCC) 20.68. However, because the subject property is in the Cherry Point Major Port/Industrial Urban Growth Area, it is also subject to the Cherry Point Industrial District (CPID) regulations (WCC 20.74). These sets of regulations are compatible, with the former containing the use and standards requirements, and the latter acting as an overlay district requiring master planning on large projects.

Table 5-10 Pertinent Comprehensive Plan Goals and Policies

Document/ Chapter	Goal	Title	Synopsis	Consistency of Gateway Pacific Terminal with Applicable Policies
Comprehensive Plan				
2		Land Use – Major Port/Industrial Urban Growth Area	Describes the history and purpose of the Cherry Point UGA, its attributes, and why port development in this area is appropriate and desirable.	Consistent with Intent Statement
	2BB		Regarding maintaining Cherry Point as an unincorporated UGA.	Consistent with Goal and Policies 1 – 10
6		Transportation		
	6Q		Regarding supporting intermodal connections that promote use of air, water, and/or rail freight.	Consistent with Goal and Policies 1 – 3
	6R		Regarding importance of inland transportation systems, including freight rail and intermodal linkages for moving goods.	Consistent with Goal and Policy 1
7		Economic Growth and Environmental Quality		
	7G		Regarding coordinating economic development with environmental, resource, and other comprehensive land use and open space policies and measures to enhance the community's overall quality of life	Consistent with Goal and Policy 6
Cherry Point/Ferndale Subarea Plan				
IV	C.4		Regarding encouraging a balanced and diversified economy; strengthening and stabilizing the tax base; and accommodating anticipated economic development in an environmentally responsible manner with consideration for public cost, energy availability, land use compatibility, and transportation accessibility.	Consistent with Goal
IV	D.2		Regarding continuing the identification of cultural and natural resources and formulating viable methods to preserve and conserve such resources in recognition of their irreplaceable character.	Consistent with Goal
IV	E.2		Regarding participating in coordination with all agencies to create an environment for the exchange of information and technical assistance.	Consistent with Goal
VI.G		Heavy Impact Industrial	Regarding the purpose of the Heavy Impact Industrial designation	Consistent with Intent Statement and Policies 1.03, 1.05, 1.06

UGA Urban Growth Area

WHATCOM COUNTY Title 20 Zoning & Comprehensive Plan Designation

COMPREHENSIVE PLAN DESIGNATIONS

- Incorporated City Limits
- Urban Growth Area
- Urban Growth Area Reserve
- Major/Port Industrial UGA
- Rural
- Small Towns
- Crossroads Commercial
- Resort/Recreational Subdivisions
- Suburban Enclaves
- Transportation Corridors
- Agriculture
- Rural Forestry
- Commercial Forestry
- Mineral Resource Lands
- Public Recreation
- Project Area Boundary
- Property Boundary

TITLE 20 ZONING DESIGNATIONS

INDUSTRIAL

HII	Heavy Impact Industrial
LII	Light Impact Industrial
GM	General Manufacturing
GI	Gateway Industrial
AO	Airport Operations

COMMERCIAL

GC	General Commercial
TC	Tourist Commercial
NC	Neighborhood Commercial
STC	Small Town Commercial
RC	Resort Commercial

URBAN RESIDENTIAL

URMX	Urban Residential-Mixed Use
URMX(10-24)	Urban Residential-Mixed Use 10-24 Units/Acre
URMX(6-12)	Urban Residential-Mixed Use 6-12 Units/Acre
URMX(6-10)	Urban Residential-Mixed Use 6-10 Units/Acre
URM(24)	Urban Residential-Medium Density 24 Units/Acre
URM(18)	Urban Residential-Medium Density 18 Units/Acre
URM(12)	Urban Residential-Medium Density 12 Units/Acre
URM(6)	Urban Residential-Medium Density 6 Units/Acre
UR(6)	Urban Residential-6 Units/Acre
UR(4)	Urban Residential-4 Units/Acre
UR(3)	Urban Residential-3 Units/Acre

RURAL RESIDENTIAL

RR(3)	Rural Residential-3 Units/Acre
RR(2)	Rural Residential-2 Units/Acre
RR(1)	Rural Residential-1 Unit/Acre
RRI	Rural Residential Island
TZ	Transitional-R5A/RR1

RURAL

R(2)	Rural-1Unit/2 Acres
R(5)	Rural-1 Unit/5 Acres
R(10)	Rural-1 Unit/10 Acres

RESOURCES

AG	Agriculture
CF	Commercial Forestry
RF	Rural Forestry
MRL	Mineral Resource Lands (Overlay Zone)

OTHER

ROS	Recreation Open Space
EI	Eliza Island

- Zoning Boundary
- Subarea Boundary
- National Forest Boundary
- Water Resource Protection Overlay Zone
- Mineral Resource Lands

Tranferrable Development Rights (TDRs)

TDR Receiving Areas - All URMX Zones except Bennett Dr.

TDR Sending Areas - Lake Whatcom Watershed (same boundary as Lake Whatcom portion of Water Resource Protection Overlay Zone) excluding Sudden Valley

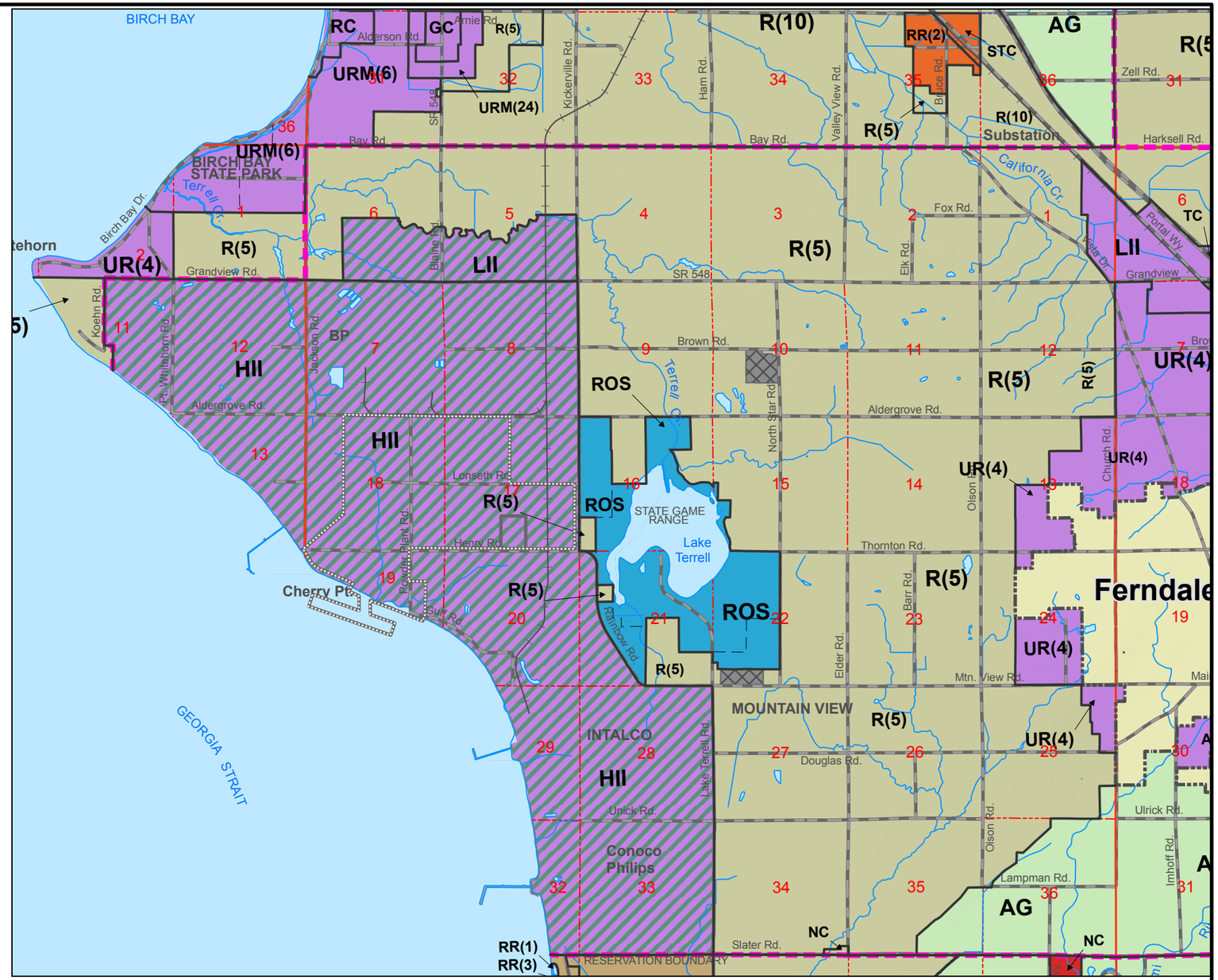
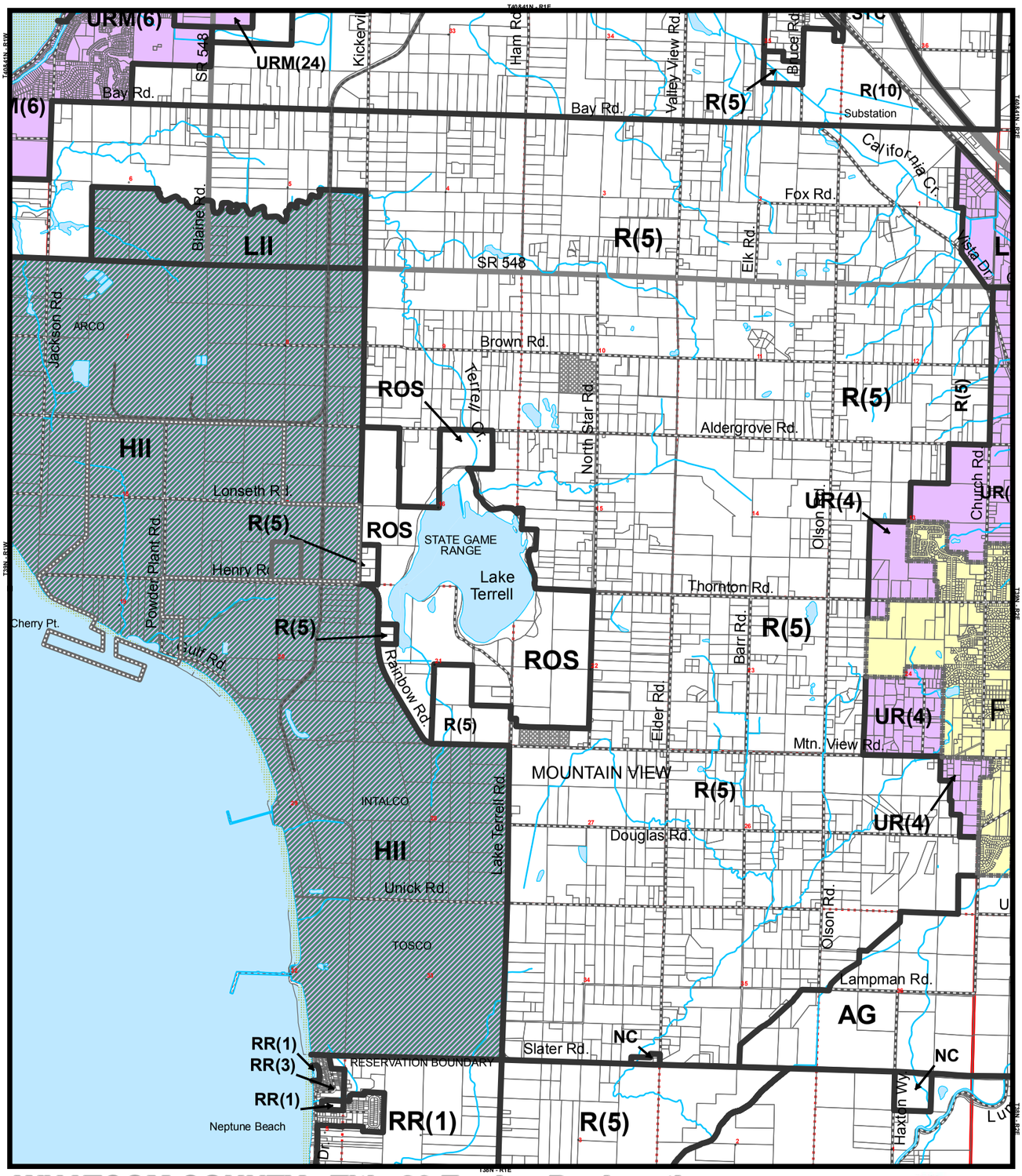


Image Source: Whatcom County GIS Services

Pacific International Terminals. A Carrix Enterprise

CLIENT:	PACIFIC INTERNATIONAL TERMINALS, INC.
DWN BY:	-dp-
CHK'D BY:	-KD-
DATUM:	
PROJECTION:	
SCALE:	As Shown
PROJECT:	PROPOSED GATEWAY PACIFIC TERMINAL
TITLE:	COMPREHENSIVE PLAN MAP
DATE:	MARCH 2012
PROJECT NO.:	091515338C-18-01
REV. NO.:	2
FIGURE NO.:	5-9



WHATCOM COUNTY - Title 20 Zoning Designations

INDUSTRIAL

HII	Heavy Impact Industrial
LII	Light Impact Industrial
GM	General Manufacturing
GI	Gateway Industrial
AO	Airport Operations

COMMERCIAL

GC	General Commercial
TC	Tourist Commercial
NC	Neighborhood Commercial
STC	Small Town Commercial
RC	Resort Commercial

URBAN RESIDENTIAL

URMX	Urban Resid. Mixed Use
URMX(10-24)	Urban Resid. Mixed Use 10-24 Units/Acre
URMX(6-12)	Urban Resid. Mixed Use 6-12 Units/Acre
URMX(6-10)	Urban Resid. Mixed Use 6-10 Units/Acre
URM(24)	Urban Resid. Medium Density 24 Units/Acre
URM(18)	Urban Resid. Medium Density 18 Units/Acre
URM(12)	Urban Resid. Medium Density 12 Units/Acre
URM(6)	Urban Resid. Medium Density 6 Units/Acre
UR(4)	Urban Residential 4 Units/Acre
UR(3)	Urban Residential 3 Units/Acre

RURAL RESIDENTIAL

RR(3)	Rural Residential 3 Units/Acre
RR(2)	Rural Residential 2 Units/Acre
RR(1)	Rural Residential 1 Unit/Acre
RRI	Rural Residential Island
TZ	Transition - R5A/RR1

RURAL

R(2)	Rural 1 Unit/2 Acres
R(5)	Rural 1 Unit/5 Acres
R(10)	Rural 1 Unit/10 Acres

RESOURCES

AG	Agriculture
CF	Commercial Forestry
RF	Rural Forestry
MRL	Mineral Resource Lands (Overlay Zone)

OTHER

ROS	Recreation Open Space
EI	Eliza Island
PUD	Planned Unit Development

Urban Growth Area

Major Port/Industrial UGA

Urban Growth Area Reserve

MRL Overlay Zone

Lake Whatcom Water Resource Protection Overlay Zone and TDR Sending Area (Sudden Valley excluded from TDR Sending Area)

Lake Samish Water Resource Protection Overlay Zone

* Provisional Rezones

Project Area Boundary

Property Boundary

GEOGRAPHIC INFORMATION SYSTEM WHATCOM COUNTY 2011 GIS Services

0 0.15 0.3 0.6 0.9 1.2 Miles

T39N - R1E

Image Source: Whatcom County GIS Services

Pacific International Terminals.

CLIENT: PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: ZONING MAP

SCALE: As Shown | PROJECTION: | DATUM: | CHK'D BY: -KD | DWN BY: -dp

DATE: MARCH 2012 | PROJECT NO.: 091515338C-18-01 | REV. NO.: 2 | FIGURE NO.: 5-10

The Cherry Point HII zone has special characteristics of regional and international significance for the siting of large industrial facilities, including deep water and access to rail transportation. The BP Cherry Point Refinery, ALCOA-Intalco Works, and ConocoPhillips Ferndale Refinery together occupy approximately 4,100 acres in Whatcom County's Cherry Point HII zone (Figure 5-10). All of these industries are dependent on water and rail access for moving commodities to and from their facilities.

Whatcom County identified this area for deep-water port industrial development, and the Comprehensive Plan and zoning regulations provide for this type of development (WCC 20.68.010). Whatcom County Code 20.68.050 (Permitted uses), subsection .059, specifically identifies "Bulk commodity storage facilities, and truck, rail, vessel and pipeline transshipment terminals and facilities" as an outright permitted use.

The proposed Terminal would result in development of an additional 334 industrial acres (of the total Project Area of 1,200 acres) and would be consistent with the HII zoning.

BNSF Railway's proposed improvements to the Custer Spur fall primarily within area zoned "R" for rural use. The Elliot Rail Yard is located within the HII zone and the Light Impact Industrial (LII) zone. Transportation facilities, including railways, are a permitted use in the Whatcom County Code within both the HII and LII zones.

5.4.1.4 *Whatcom County Shoreline Master Program*

The purpose of Washington's Shoreline Management Act is to manage and protect the shorelines of the state by regulating development in the shoreline area. Its jurisdiction includes the Pacific Ocean shoreline and the shorelines of Puget Sound, the Strait of Juan de Fuca, rivers, and streams and lakes above a certain size. It also regulates "wetlands" associated with these shorelines. The primary responsibility for administering this regulatory program is assigned to local governments. Local governments have done so through the mechanism of shoreline master programs, adopted under rules established by Ecology that establish goals and policies implemented through use regulations. No substantial development is permitted on the state's shoreline unless a permit is obtained from the local jurisdiction.

The project area is bounded by the Strait of Georgia on the southwest. The portion of the project site that is seaward of the extreme low tide line is considered a shoreline of statewide significance under the state's Shoreline Management Act of 1971 [RCW 90.58.030(2)(e)(iii)]. A shoreline of statewide significance refers to a specific category of shoreline where certain priority uses are preferred and identified in the statute and in the local shoreline master program for the jurisdiction.

The County's Shoreline Management Program is codified as WCC Title 23. It designates the shoreline within the project area as part of the Cherry Point Management Area (Figure 5-11). This designation is intended to balance the natural habitat features found in the Cherry Point area with the unique features that make it ideal for water-dependent facilities. The Shoreline Management Program specifically identifies water-dependent industrial facilities as the preferred use in the area, but the area is limited to one additional pier. The proposed Terminal is consistent with the Shoreline Management Program for the development of the project site. Section 2.1.1.2 provides a brief history and explanation of the existing Shoreline Substantial Development Permit for the project.

The originally approved permits for the Gateway Pacific Terminal, issued on May 13, 1997, were reviewed through a lengthy public process and found to be consistent with Whatcom County shoreline provisions. This decision was subsequently appealed, and Pacific International Terminals entered into a settlement agreement with the appellants. The original Substantial Development Permit is still in effect, and was reaffirmed by Whatcom County on January 15, 2009.

BNSF Railway's proposed Custer Spur improvements would cross Terrell Creek and California Creek. However, neither is considered a Shoreline of the State in this location. Thus, the rail improvements are outside the jurisdiction of Whatcom County's Shoreline Management Program.

5.4.2 Potential Effects on Land Use

The proposed project would not have any major impacts on land use in the project area. Currently, other than habitat, the property serves minimal use, and the only use that has been approved by Pacific International Terminals is pasture and hay farming by a tenant farmer on approximately 100 acres of the property. Though Terminal development would result in permanent loss of this existing use, the type of development proposed is what has been envisioned for this property and planned for as stated in the County's Comprehensive Plan. The proposed project is consistent with the Comprehensive Plan and Whatcom County's zoning and Shoreline Management designations, which specifically identify water-dependent industries as a preferred use in the area. Additionally, the proposed project is consistent with immediately surrounding industrial land uses.

BNSF Railway's proposed improvements to the Custer Spur would convert approximately 43 acres of land between Ham Road and Brown Road, linear and contiguous to the existing railroad right-of-way, from potentially rural use to transportation land use. The Elliot Rail Yard improvements proposed by BNSF Railway would not have any major impacts on land use, as they would occur within the existing Major Port/Industrial UGA and would be consistent with land uses identified under the existing zoning and Comprehensive Plan designations.

OFFICIAL SHORELINE MAP - EXHIBIT 3

Shoreline Area Designations

- Urban
- Urban Resort
- Urban Conservancy
- Shoreline Residential
- Rural
- Resource
- Conservancy
- Natural
- Tribal
- Cherry Pt. Management Area
- Aquatic
  Applies to all areas waterward of OHWM on Shorelines of the State

- Area Designation Breaks
- Urban Growth Areas
- Section Lines
- City Boundaries
- Whatcom County Boundaries

- Project Area Boundary
- Property Boundary

0 0.5 1 2 Miles

0 500 1,000 1,500 2,000 Meters

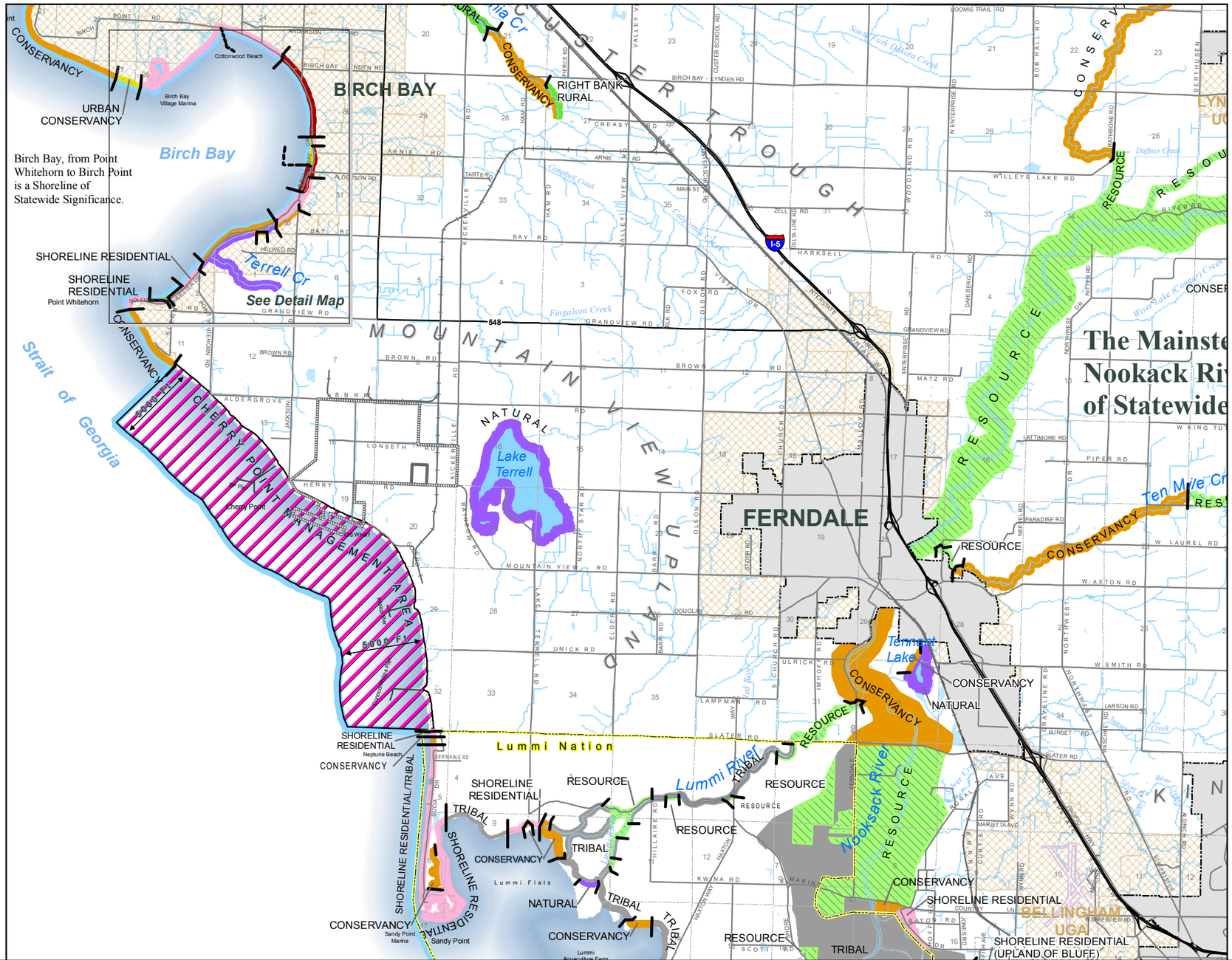


Image Source: Whatcom County

Pacific International Terminals
A Carrix Enterprise

CLIENT:	PACIFIC INTERNATIONAL TERMINALS, INC.
DWN BY:	-dp-
CHK'D BY:	-KD-
DATUM:	
PROJECTION:	
SCALE:	As Shown
PROJECT:	PROPOSED GATEWAY PACIFIC TERMINAL
TITLE:	SHORELINE MANAGEMENT PROGRAM DESIGNATION MAP
DATE:	MARCH 2012
PROJECT NO.:	091515338C-18-01
REV. NO.:	2
FIGURE NO.:	5-11

5.4.3 Proposed Design Features Intended to Reduce Impacts

No measures are proposed for impacts to land use, as no adverse impacts would occur.

5.5 SOCIOECONOMIC ENVIRONMENT

This section describes the social and economic conditions of the project vicinity, including demographics, income, employment, and public finances, and examines the effects of the proposed action on the socioeconomic environment.

Key issues of concern regarding the project relative to socioeconomic factors include:

- Effects to the local and state economy;
- Effects to commercial fishing and tourism; and
- Effects to public services and infrastructure.

5.5.1 Affected Environment

Population centers in Whatcom County include the incorporated cities of Bellingham, Blaine, Everson, Ferndale, Nooksack, and Sumas. Three additional population centers in unincorporated areas within the county include Birch Bay, Cherry Point, and Columbia Valley. The study area for the socioeconomic environment includes Whatcom County and the State of Washington.

5.5.1.1 *Population and Demographics*

The estimated population in 2009 for Whatcom County was approximately 200,000 people. The population of Whatcom County grew by 20.1 percent from 2000 to 2009 (Table 5-11), a growth rate that exceeded the statewide growth rate for the same period (13.1 percent).

According to 2009 estimates, Whatcom County had a younger median population age (35.8 years) compared to the State of Washington (36.8 years). In 2009, a large majority of the population in Whatcom County (83.3 percent) classified themselves as being white persons not of Hispanic origin, compared to 74.6 percent of the people in the state as a whole. Approximately 10 percent of the people living in Washington classified themselves as being of Hispanic or Latino origin, compared with approximately 7 percent of the residents of Whatcom County in this same classification. American Indian and Alaska Native persons constituted 3 percent of the population of Whatcom County in 2009, as compared with 1.8 percent in the State of Washington. The percentage of black persons in Whatcom County (1.1 percent) was lower than in the state as a whole (3.9 percent) in 2009.

Housing construction in Whatcom County kept pace (19.4 percent increase) but lagged slightly with population growth (20.1 percent) from 2000 to 2009. The State of Washington's construction rate for

the same period exceeded population growth for the same period (14.8 and 13.1 percent, respectively). Whatcom County and the State of Washington had similar average household size in 2009, at 2.48 and 2.52 persons, respectively.

Table 5-11 General Population and Demographic Information, Whatcom County and State of Washington

Social Attribute	Whatcom County	State of Washington
Population		
Population, 2009 estimate	200,434	6,664,195
Population, 2000 Census	166,828	5,894,143
Population, percent change, 2000 to 2009	20.1	13.1
Demographics		
Female persons, percent, 2009	50.6	50.0
Male persons, percent, 2009	49.4	50.0
Median age in years, 2005-2009 estimate	35.8	36.8
Persons under 5 years old, percent, 2009	5.9	6.8
Persons under 18 years old, percent, 2009	20.9	23.6
Persons 65 years old and over, percent, 2009	13.0	12.1
White persons not Hispanic, percent, 2009	83.3	74.6
Persons of Hispanic or Latino origin, percent 2009	7.2	10.3
American Indian and Alaska Native persons, percent 2009	3.0	1.8
Black persons, percent, 2009	1.1	3.9
Foreign born persons, percent, 2000	9.8	10.4
Language other than English spoken at home, percentage 5+, 2000	9.2	14.0
High school graduates, percent of persons age 25+, 2000	87.5	87.1
Bachelor's degree or higher, percent of persons age 25+, 2000	27.2	27.7
Housing		
Housing units, 2009 estimate	88,205	2,813,372
Housing units, 2000 Census	73,893	2,451,075
Housing units, percent change, 2000 to 2009	19.4	14.8
Average household size, 2009 estimate	2.48	2.52

Sources: US Census Bureau – State & County QuickFacts, 2010a
US Census Bureau, 2010b, 2005-2009 American Community Survey

5.5.1.2 *Employment, Income, and Economy*

Preliminary employment data for the first quarter of 2010 indicated that the government sector was the largest employer in the State of Washington (Table 5-12), with approximately 525,000 jobs, followed by the health care and social assistance (318,147), retail trade (296,088), and manufacturing (250,076) sectors. A similar employment mix was present for the same period in Whatcom County.

The county's major employment sectors included government (14,547), health care and social assistance (9,486), retail trade (9,423) and manufacturing (7,317).

Table 5-12 Employment by Industry, Whatcom County and the State of Washington, First Quarter 2010 (Preliminary)

	Whatcom County			State of Washington		
Industry Description	**Average Employment**	**Average Weekly Wage**	**Average Quarterly Wage**	**Average Employment**	**Average Weekly Wage**	**Average Quarterly Wage**
Agriculture, Forestry, Fishing and Hunting	2,357	$453	$5,886	67,098	$472	$6,139
Mining	120	$899	$11,687	1,990	$1,026	$13,333
Utilities	176	$1,273	$16,554	4,800	$1,482	$19,267
Construction	4,760	$904	$11,746	124,402	$931	$12,106
Manufacturing	7,317	$1,096	$14,250	250,076	$1,208	$15,700
Wholesale Trade	2,573	$865	$11,242	115,879	$1,183	$15,378
Retail Trade	9,423	$451	$5,862	296,088	$554	$7,204
Transportation and Warehousing	1,738	$695	$9,036	76,622	$902	$11,729
Information	1,453	$789	$10,259	101,395	$1,857	$24,142
Finance and Insurance	1,818	$1,021	$13,272	88,590	$1,476	$19,194
Real Estate, Rental and Leasing	881	$538	$6,991	43,349	$738	$9,592
Professional, Scientific and Technical Services	3,054	$1,008	$13,105	155,294	$1,354	$17,600
Management of Companies and Enterprises	473	$1,059	$13,763	31,754	$1,769	$23,000
Administrative, Support, Waste Management and Remediation Services	2,846	$609	$7,911	121,514	$775	$10,075
Educational Services	713	$379	$4,925	34,230	$634	$8,243
Health Care and Social Assistance	9,486	$670	$8,704	318,147	$797	$10,367
Arts, Entertainment and Recreation	1,473	$298	$3,879	42,519	$480	$6,236
Accommodation and Food Services	7,208	$262	$3,412	207,721	$325	$4,219
Other Services (Except Public Administration)	3,328	$428	$5,561	127,912	$452	$5,874
Government	14,547	$843	$10,960	525,483	$945	$12,283
Total All Industries	75,743	$697	$9,067	2,734,862	$899	$11,685

Source: Washington State Employment Security Department, 2010

As shown in Table 5-12 in the first quarter of 2010, industrial sectors in the State of Washington with the highest average weekly wages included information industry workers ($1,857), management of companies and enterprises ($1,769), and utilities ($1,482). The highest paying sectors in Whatcom County based on weekly average wages for the same period included utilities ($1,273), manufacturing ($1,096), management of companies and enterprises ($1,059), and finance and insurance ($1,021).

Household economic characteristics for both Whatcom County and the State of Washington are shown in Table 5-13.

Table 5-13 Economic Characteristics for Whatcom County and the State of Washington

Economic Attribute	Whatcom County	State of Washington
Per capita income, 2009	$25,021	$29,320
Median family income, 2009	$63,624	$68,457
Median household income, 2009	$47,812	$56,384
Median value of owner-occupied housing units, 2009	$288,500	$277,600
Individuals below poverty level, percent, 2008	15.4	11.8
Unemployment rate, percent, November 2010 (Preliminary)	7.9	9.1

Sources: US Census Bureau, 2010b – American Community Survey 5-Year Estimates
Washington State Employment Security Department, 2010b

In general, 2009 income levels in Whatcom County were lower than in the State of Washington. Median family income in Whatcom County equaled $63,624, while the state's median family income equaled $68,457 that year. A larger portion of Whatcom County's population (15.4 percent) fell below the individual poverty level, compared with the state as a whole (11.8 percent). Preliminary November, 2010, unemployment rates (not seasonally adjusted) indicate that the rate was lower in Whatcom County (7.9 percent) than for the state overall (9.1 percent).

5.5.1.3 *Public Finances*

Mechanisms readily available to the state and/or counties to fund government functions include sales and use taxes, business-related taxes, property taxes, revenues through permits, licenses, and fees. No state personal or corporate income taxes exist within the State of Washington.

Sales and Use Taxes

As shown in Table 5-14, the State of Washington administers a sales and use tax rate of 6.5 percent. In addition, unincorporated areas of Whatcom County have a 1.4 percent sales and use tax rate, while all other areas in the County have a 2.0 percent tax rate.

Table 5-14 2010 Combined State and Local Sales and Use Taxes, Locations within Whatcom County

Location	Local Code	Local Rate	State Rate	Combined State/ Local Rate
Unincorp. Areas	3700	.014	.065	.079
Unincorp. PTBA*	3737	.020	.065	.085
Bellingham	3701	.020	.065	.085
Blaine	3702	.020	.065	.085
Everson	3703	.020	.065	.085
Ferndale	3704	.020	.065	.085
Lynden	3705	.020	.065	.085
Nooksack	3706	.020	.065	.085
Sumac	3707	.020	.065	.085

Source: Washington Department of Revenue, 2010a

* PTBA = Public Transportation Benefit Area

(Rates presented are percent per dollar spent on sales or use)

Business-Related Taxes

The State of Washington's Business & Occupation (B&O) tax consists of a tax based on the gross receipts from the value of products, gross proceeds of sale, or gross income of the business. Tax calculations are derived from the gross income from all business activities, including labor and materials. Tax rates for the major B&O classifications, as determined by the State of Washington and potentially applicable to the construction and operation of the Terminal project, include retail trade at 0.471 percent; wholesaling and manufacturing at 0.484 percent; and service and other activities at 1.8 percent.

The State of Washington also administers a number of excise taxes in addition to the B&O tax, retail sales, use, and property tax. Specifically, the public utility tax consists of a tax on public service businesses, including those that engage in transportation-related activities. The tax is administered in lieu of the B&O tax. Two excise taxes of most relevance related to the project include:

- A tax of 1.926 percent on railroads, railroad car companies, motor transportation, and all other public service businesses; and
- Utility tax: according to Department of Revenue information, most public utility tax money is deposited into the state general fund, with some funding provided to local governments for maintenance of public works facilities (Washington Department of Revenue 2010a).

Property Taxes

The rate at which property taxes are applied is based on a number of components, including land use and improvements made to a property. According to Whatcom County, levy rates vary for each taxing

district depending upon the budget for each district and any voter-approved special levies and bonds. This levy rate is multiplied per thousand dollars of assessed value.

Whatcom County's 2010 consolidated levy rate in the project area equaled $8.45235 per thousand dollars of assessed value for Code Area 3020 503F7 C7 NPR (Section 18 of Township 39 North, Range 1 East).

Operational Permits, Licenses, Fees, and Assessments

A number of permits, licenses, and fees would be required for the construction and operation of the project. Those associated with development of the property are addressed in Chapter 2. Other fees or licenses for operation of the Terminal would include wharf and dock fees (based on the gross tonnage of each vessel), state business registration, registration of weighing and measuring devices, assessments on transport of agricultural commodities, and state fuel taxes.

Import/Export Duties or Tariffs

Import and export trades include duties (tariffs) as a result of commerce with other nations by international agreement. Shipments originating from overseas may generate a revenue source in the form of tariffs and/or duties applied to the incoming commodity. According to the US International Trade Commission, US duties vary depending upon the commodity imported into the US. Carbon products (coal, petroleum coke, and calcined coke), industrial minerals (lime rock, phosphate rock, potash, sulfur, and salt), aggregates (sand and gravel), wood products (chips and pellets), and ores (concentrate and pelletized ore) typically have no tariff associated with their import to the US. Grain products generally have tariffs ranging, for example, from $0.001 to $0.0015 per kilogram for barley, $0.0039 to $0.0058 per kilogram for oil seeds, and $0.0035 to $0.0065 per kilogram for wheat (US International Trade Commission 2010).

Tariffs or duties on exports applied by other nations vary depending upon the nation and the commodity. Many nations also levy consumption taxes or value added taxes (VAT) in addition to tariffs. For instance, Japan applies a 5 percent consumption tax applied on cost, insurance, and freight (CIF plus duty); South Korea applies a VAT of 10 percent on the CIF plus duty value; and China applies a consumption tax of 2 to 3 percent on the CIF, as well as a 13-17 percent VAT for most goods (US Department of Commerce 2010).

5.5.2 Construction Effects

Potential economic and social effects resulting from the construction of the project include increased employment and income stemming directly and indirectly from the project. As described in Chapter 4, the proposed project's four-year construction period would take place in two stages commencing in 2014 as shown in Table 5-15. It is also assumed that the estimated construction cost of the Terminal

would be approximately $665 million, of which $624 million is expected to be local purchase of construction supplies and services (construction cost estimate based on 54 Mtpa throughput) (Martin Associates 2011).

Table 5-15 Terminal Construction by Stage

Construction Stage	Construction Start (Year)	Construction Complete (Year)	Construction Components
1	2014	2015	Stage 1 & 2 wetland mitigation; East Loop infrastructure and utilities; East Loop rail lines (2 tracks in/2 out, and 3 R&D tracks); conveyor system from East Loop to berth; access trestle; wharf; cargo handling equipment; support buildings
2	2016	2017	West Loop infrastructure; utilities; West Loop rail lines (2 tracks in/3 out); A-frame storage shed, bulk storage silos; conveyor to connect to previously constructed system; additional cargo handling equipment (at East Loop and wharf); and East Loop rail lines (2 additional tracks in/2 out). It is also anticipated the second set of tracks along Custer Spur would also be constructed during this Stage

5.5.2.1 *Employment and Income*

Jobs created by the project would include the following employment categories:

- Direct employment (jobs directly generated and funded by the project);
- Induced employment (jobs created in the local economy due to purchases made by direct workforce expenditures); and
- Indirect employment (jobs created by purchases for goods and services by project operators).

Each of these potential employment categories are described below.

Using the US Bureau of Economic Analysis, Regional Input-Output Modeling System (RIMS) output data for the State of Washington, $411 million dollars in personal income from construction activity would support a total of approximately 21.8 million hours of employment over a 4-year construction period (Martin Associates 2011). This employment is anticipated to include approximately 9.2 million hours of direct construction employment and 12.5 million hours of induced and indirect employment. (Martin Associates 2011). Assuming a 2,080-hour annual job equivalency, an average of approximately 1,100 direct jobs and 1,500 induced and indirect jobs would be generated from construction of the proposed project over a 4-year construction schedule.

The direct employment classification of new workers would be in the construction industry, and the average wage rate for this job classification in Whatcom County in 2010 was approximately $47,000 per year (Table 5-12). Similarly, average wage rates for anticipated induced and indirect jobs are $36,000 per year (Table 5-12). Based on these wage rates, jobs generated as a result of the project construction would average approximately $106 million in income per year over the course of project construction.

5.5.2.2 *Local and Regional Purchases*

Direct construction and capital expenditures for the project are estimated to be approximately $655 million, with $624 million in local purchases over the approximately 4-year construction period (Martin Associates 2011).

5.5.2.3 *Public Finances*

Construction of the Terminal would result in a wide range of potential local and state tax and fee payments. These include state and local sales and use taxes, the State of Washington's B&O tax and/or Public Utility Tax, local property taxes, as well as potential state and local permit, lease, and license fees.

State and local taxes and fees associated with construction-related business revenue and direct, indirect, and induced employment are estimated to total approximately $71 million over the 4-year construction term (Martin Associates 2011). Additional local and state government revenue would be generated via annual property taxes and any necessary construction-related permit and license fees.

5.5.2.4 *Public Services and Infrastructure*

Subject to the available capacity of public services (teachers, police, and fire personnel) and infrastructure (schools, roads and hospitals) at the time of construction, demand for these services would increase in proportion to the influx of new workers into the area.

5.5.3 Operational Effects

Potential economic and social effects resulting from operation of the Terminal include increased employment and income stemming directly and indirectly from the project. Impacts would also include positive and potentially negative impacts on the local, regional, and state economy. It is anticipated that the first commodities would be moved through the facility in 2016.

5.5.3.1 *Employment*

As described in Section 4.4.3, four operational phases, representing the growth in capacity of the Terminal (nominal maximum throughput), are anticipated (Table 4-2). Operation of the Terminal would take place 24 hours a day, 365 days a year, and would require up to 213 full time shift workers at

maximum capacity. Anticipated staffing levels by shift for each of the four operational phases are shown in Table 4-3.

When the terminal begins operation during Phase 1, it is assumed that 39 employees would operate the day shift and approximately 25 employees would operate the two night shifts, for a total Phase 1 staffing of 89 employees. The total employment for the three shifts would increase to approximately 213 employees at full operational capacity during Phase 4.

Additional direct employment resulting from Terminal operation would include Terminal administrative staff (44 workers), BNSF Railway workers (66), and pilots, tug operators, and other marine service workers (107 workers). Total direct employment related to the terminal would be up to 294 employees during the early period of operation, and would be expected to grow to approximately 430 jobs at full Terminal operating capacity. All these new occupations are attributed to the transportation industry according to job classification codes and would likely command an average annual wage just over $36,000 per year for the life of Terminal operation. Collectively, at full capacity operation, this group would earn almost $15.5 million dollars per year (in 2010 dollars) for the life of the Terminal.

Using the modeled direct, induced, and indirect employment ratio of 4.05 from the RIMS (Martin Associates 2011), it is anticipated that 293 direct jobs created through Terminal operation would create an additional 1,741 jobs in the local and regional economy. Annual wages and salaries earned in these induced and indirect employment categories may best be represented by the 2010 average weekly wage in Whatcom County of $697 or $36,244 per year (Table 5-12). These new employment groups would collectively earn nearly $63 million dollars a year for the life of the Terminal.

5.5.3.2 *Local and Regional Purchases*

Economic impacts related to operation of the Terminal include not only direct, induced, and indirect employment and income generated by wages from those jobs, but also local and regional purchases by businesses and individuals directly related to the Gateway Pacific Terminal.

Annual estimated business revenue associated with Terminal operation based on throughput of 54 Mtpa would total approximately $1.4 billion, with annual local and regional purchases totaling $17 million (Martin Associates 2011).

5.5.3.3 *Public Finances*

Operation of the Terminal would result in a wide range of potential local and state tax and fee payments. These would include state and local sales and use taxes, the State of Washington's B&O

tax and/or Public Utility Tax, local property taxes, as well as potential state and local permit, lease, and license fees, terminal-related wharf or dock fees, and tariffs on commodity throughput.[2]

State and local tax impacts include those payments by firms or individuals either directly employed by, or having jobs supported by, operation of the Terminal. Estimates for state and local tax receipts based on 54 Mtpa throughput equal approximately $11.2 million annually (Martin Associates 2011). Additional state and local government revenue would be generated via annual property taxes; any required annual permit, lease, or license fees associated with Terminal operation; wharf and dock fees; and tariffs on throughput.

5.5.3.4 *Public Services and Infrastructure*

Subject to the available capacity of public services (teachers, police, and fire personnel) and infrastructure (schools, roads, and hospitals) at the time of construction, demand for these services would increase in proportion to the influx of new workers (if any, based on current labor capacity at the time of construction) into the area. As construction of the Terminal is completed and the operational phase commences, fewer workers would be required, potentially reducing demand for services relative to the construction period.

5.5.3.5 *Tribal, Commercial Fishing, and Tourism*

Vessel traffic in and out of the Terminal could affect tribal and commercial fishing and tourism. Fisheries in the project vicinity are located in Usual and Accustomed Fishing Grounds for both the Lummi Nation and Nooksack Tribe; the Suquamish, Swinomish, and Tulalip Tribes also may fish in waters surrounding the project area. (Whatcom County 1997).

The southeast Strait of Georgia has been noted as the most important area for the production of Dungeness crab in Puget Sound. Year-round tribal harvest reportedly grew from 13 percent to 53 percent of total commercial harvest between 1990 and 1995. (Whatcom County 1997).

The herring sac-roe fishery is managed jointly by WDFW and four northern Puget Sound herring fishing tribes (Lummi, Nooksack, Swinomish, and Suquamish). The WDFW and the Tribes meet annually to set harvest quotas and other regulations. The area between Point Whitehorn and Sandy Point has historically served as a fishing ground for the herring fishing fleet. However, by the mid-1990s, the only herring fisheries occurring on or around Cherry Point were the tribal and nontribal spawn-on-kelp (SOK) fisheries and a small sac-roe gillnet fishery conducted by the Nooksack Tribe (Whatcom County 1997). The nontribal fishery was legislatively limited to a small number of SOK permits per year at the time (Whatcom County 1997).

2 More specific information on sources of business revenue and property valuation of the Terminal when operational would be required to analyze fully the public finance implications.

The Strait of Georgia also serves as an important fishing area for five species of Pacific salmon (Chinook, Coho, sockeye, pink, and chum). Tribal fishers reportedly use purse seine, gill net, setnet, salmon troll, lampara, and beach seines for their catch. Annual fishing seasons are determined based on the size of salmon returns, though typically a season begins in mid-June and extends to September.

To the extent that the location of project facilities and vessel traffic to and from the Terminal impede tribal or commercial fishing success or tourism, effects on income generated could occur. Potential impacts may include but are not limited to interactions between fishing and/or recreational vessels and marine/tug vessels, degradation in water quality, impacts on spawning fish populations, and shoreline and tidal area impacts.[3]

5.5.4 Proposed Design Features Intended to Reduce Impacts

5.5.4.1 *Public Services and Infrastructure*

In the short-term (first 16 months starting with construction), an influx of workers may increase demand on public service providers and infrastructure, such as schools, emergency management systems, and other county infrastructure. More information is required on both the capacity of the local labor market for the availability of construction workers and for the capacity of public service sectors to accommodate a potential influx of people to the area. With the addition of new jobs and tax revenue generated by the project, increased tax revenues would offset increased demand for these services. However, additional tax revenues typically lag behind initial increase in demand for services. A measure to reduce potential impacts could include advanced tax funding to support public services generated from new local and state tax payments generated by the project.

5.5.4.2 *Commercial Fishing and Tourism*

Additional technical analysis will be conducted to assess potential effects on commercial and tribal fisheries. Mitigation measures considered in the 1997 EIS related to the Shoreline Development Permit included:

- Schedule construction to avoid herring spawning activities; and
- Assign approach and departure corridors for commercial traffic to minimize potential conflict with commercial and tribal herring fisheries.

3 These topics were addressed in previous studies (Gateway Pacific Terminal Final EIS 1997). Additional information should be collected to evaluate any subsequent changes to these resources since that time to accurately forecast potential project impacts.

5.6 ENVIRONMENTAL JUSTICE

On February 11, 1994, President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. The purpose of the order is:

> "…to avoid the potential disproportionate placement of adverse environmental, economic, social, or health effects from federal actions and policies on minority and low-income populations, including Indian Tribes."

5.6.1 Affected Environment

The first step in analyzing this issue is to identify minority and low-income populations that would be affected by implementation of the proposed action. Demographic information on ethnicity, race, and economic status is examined in this section as the baseline against which potential effects can be identified and analyzed. The study area related to environmental justice issues includes Whatcom County and the State of Washington, including specific consideration of two Indian Tribes with reservation lands located in Whatcom County: the Lummi Nation and the Nooksack Tribe.

5.6.1.1 *Identification of Minority and Low Income Populations*

The CEQ identifies groups of people as environmental justice populations when either (1) the minority or low-income population of the affected area exceeds 50 percent or (2) the minority or low-income population percentage in the affected area is meaningfully greater than the minority population percentage in the general population or appropriate unit of geographical analysis (Council on Environmental Quality 1997). In order to be classified as *meaningfully greater*, a formula describing the environmental justice threshold as being 10 percent above the State of Washington's rate is applied to local minority and low-income rates per the CEQ guidance. For purposes of this section, minority and low-income populations are defined as follows:

- *Minority populations* are persons of Hispanic or Latino origin of any race, Blacks or African Americans, American Indians or Alaska Natives, Asians, and Native Hawaiian and other Pacific Islanders.
- *Low-income populations* are persons living below the poverty level. The US Census estimates that the poverty-weighted average threshold for a family of four in the United States equaled $21,954 and $10,956 for an unrelated individual in 2009 (US Census Bureau 2010c).

5.6.1.2 *Minority Populations*

As shown in Table 5-11, the American Indian and Alaska Native population in Whatcom County totaled 3.0 percent of total population in 2009 as compared to 1.8 percent for the State of Washington. This 1.2 percent disparity, on a countywide level, is less than the 10 percent difference requirement to establish an environmental justice population based on minority populations. Regardless, the Lummi

Nation requests that *Environmental Justice* analyses be conducted for any project that may have impacts within the Lummi Reservation, Usual and Accustomed Area, or ceded area (Meyer Resources 2004).

5.6.1.3 *Low Income Populations*

As shown in Table 5-13, the estimated number of persons in 2008 below the poverty level threshold in Whatcom County totaled 15.4 percent, as compared to 11.8 percent in the State of Washington. This 3.6 percent disparity, on a countywide level, is less than the 10 percent difference requirement to establish an environmental justice population based on the low income criterion.

5.6.1.4 *Whatcom County Tribal Populations*

Tribal populations specifically located within Whatcom County warrant further consideration given their proximity to the project area and the specific cultural and economic relevance of the Cherry Point area to both tribes. Comment letters presented within the 1997 Gateway Pacific Terminal Final EIS (Whatcom County 1997) state that the project area is located within the historic site of the Lummi Nation called Xwe' Chiexen (Cherry Point), and several registered and unregistered areas of cultural significance exist within the project area. In addition, the Treaty of Point Elliott of 1855 provides the Lummi with primary fishing rights for the waters surrounding Xwe' Chiexen. The Nooksack are also signatories under this treaty and have stated that they use the project area for economic (salmon) and spiritual/cultural uses (including crabbing and clam digging).

Lummi and Nooksack Populations

While the project area excludes tribally owned lands, the Lummi Reservation is located within a few miles to the south and contains 12,500 acres of mainland and 7,000 acres of tidelands along the 5-mile Lummi Peninsula. Lummi Bay lies to the west and Bellingham Bay to the east. In 2008, approximately 4,200 tribal members were enrolled in the Lummi Nation, with 2,400 living on the reservation itself (Lummi Natural Resources Department 2008). According to 2000 Census data, the population of the Lummi Reservation totaled 4,193 (Table 5-16).

The Nooksack Tribe, also located in Whatcom County, is located 17 miles east of Bellingham in Deming, Washington, with self-reported enrollment of approximately 2,000 people. According to 2000 Census figures, the population of the Nooksack Reservation and off-reservation trust lands totaled 547 (Table 5-16).

Table 5-16 summarizes a range of available socioeconomic statistics derived from the 2000 Census. In general, the Nooksack Reservation displayed substantially different demographic and economic characteristics than those of the Lummi Reservation or Whatcom County as a whole. For instance, while median age within the Lummi Reservation was similar to that of Whatcom County (35.2 years

and 34 years respectively); median age within the Nooksack Reservation was only 21.9 years in 2000.

Table 5-16 Socioeconomic Characteristics of the Lummi and Nooksack Reservations

Selected Socioeconomic Attributes	Lummi Reservation	Nooksack Reservation	Whatcom County
Total population, 2000	4,193	547	166,814
Median age, 2000	35.2	21.9	34.0
Average household size, 2000	2.9	4.0	2.51
Median age, 2000	35.2	21.9	34.0
Per capita income, 1999	$17,669	$10,515	$20,025
Median family income, 1999	$40,319	$28,281	$49,325
Median household income, 1999	$37,014	$28,515	$40,005
Median value of owner-occupied housing units, 2000	$147,400	$82,500	$155,700
Individuals below poverty level, percent, 1999	18	29	14.2

Source: US 2000 Census, SF1 and SF3

Per capita income levels for both the Lummi and Nooksack Reservations are modest; median per capita income in 2000 was $17,669 for members of the Lummi Nation and $10,515 for members of the Nooksack Tribe. In 2000, 29 percent of individuals within the Nooksack Reservation were below poverty level, versus 18 percent within the Lummi Reservation. For the period, the poverty level difference between Whatcom County and the Nooksack Reservation exceeded 10 percent, establishing the Nooksack Reservation inhabitants as an environmental justice population based on income criteria in 2000.[4]

Tribal Use of Coastal Resources

The Lummi, located directly south of the project area, have always been strongly associated with the ocean and have traditionally relied on seafood as a major component of their diet. The Lummi Nation is reportedly the largest fishing tribe in Puget Sound. However, declines in the regional salmon fishery have dramatically altered the tribal dependence on salmon fishing as an income generating activity since the mid 1980s. Specifically, the average Lummi fisherman, comprising approximately 30 percent of the tribal workforce at the time, earned $22,796 from fishing in 1985. Income from commercial fishing fell to $5,555 by 1993. The annual reported value of the Lummi Nation's fishery totaled over $11 million in 1985, but declined to $5 million by 2001 (Lummi Natural Resources Council 2008).

The Lummi Natural Resources Council reported that the Lummi Indian Business Council commissioned a survey of adult tribal members in 2003. Approximately 28 percent of adult tribal members were unemployed, with up to 14 percent more underemployed at the time. This compares to

4 More information (as may be available from the 2010 Census) would be required for a current evaluation of these populations on the basis of income to determine current conditions.

an average 6.8 percent unemployment rate for Whatcom County that same year (Bureau of Labor Statistics 2011). According to the Lummi Natural Resources Council, the declining fishery was specifically identified as a factor for this difference. Additional information would be required to establish the Lummi Nation as an environmental justice population based on income[5].

5.6.2 Effects

Potential environmental justice effects include potential economic, environmental, and social impacts to the Lummi and Nooksack tribal members in particular, stemming directly or indirectly from construction and operation of the project.

As discussed above, the project area is located within a Lummi Nation historic site called Xwe' Chiexen, and the Lummi specifically identify themselves as holding primary fishing rights in coastal waters surrounding the project under the Treaty of Point Elliott of 1855. The Nooksack are also signatories under this treaty and have stated that their economic and spiritual/cultural use of the vicinity would be impacted by a project at Cherry Point. As such, any activities that have the potential to impact fisheries and marine resources could potentially affect the Lummi and Nooksack, and potentially other Tribes with treaty fishing rights in the area, disproportionately.[6]

Government-to-government consultation, as directed by Section 106 of the NHPA, has been underway since 2009. The USACE has sent project description letters to affected Native American Tribes, including the Lummi Nation and Nooksack Tribe; however, no specific information has been made available regarding tribal responses to date. As such, previous tribal concerns as outlined in the Gateway Pacific Terminal Final EIS (1997) will be utilized as a proxy for current conditions.

Previously identified tribal concerns related to expansion of a marine terminal at Cherry Point include potential impacts due to an increase in vessel traffic and associated increase in fuel and other material handling, direct damage to fishing vessels and gear from interactions with commercial vessels, potential degradation of water quality and fish habitat from construction and operation of a facility, potential damage to tribal tidelands by interruption of sediment transport, and direct permanent loss of fishing opportunities in and around the project area (Whatcom County 1997).

As discussed, concerns outlined above were identified in conjunction with the project considered in 1997. The proposed project being considered at this time would include throughput of up to 54 Mtpa, as compared to throughput of approximately 8.2 Mtpa considered then. Project concerns

5 More information (as may be available from the 2010 Census) would be required for a current evaluation of these populations on the basis of income to determine current conditions.

6 These topics were addressed in previous studies (Gateway Pacific Terminal Final EIS 1997). Additional information should be collected to evaluate any subsequent changes to these resources since that time to accurately forecast potential project impacts.

in 1997 were largely related to impacts due to increased marine traffic and infrastructure development. It is likely that tribal concerns would be similar under the current proposed action.

Additional information is needed to estimate current income levels for potentially affected populations and to determine whether either the Nooksack Tribe or Lummi Nation would be currently considered an environmental justice population.

Both the Lummi Nation and the Nooksack Tribe have requested that more complete studies be commissioned in advance of any project approvals to understand more fully the associated risks and potential impacts to the marine environment and tribal fishing communities.

Mitigation measures in the 1997 Gateway Pacific Terminal Final EIS remain relevant in the absence of new data on the current state of the fishing industry and the Tribes' dependence on it. See Section 5.5.4.2 for these mitigation measures.

Continued tribal consultation with the Lummi and Nooksack, as well as with other Tribes with treaty rights near the project area (potentially the Suquamish, Swinomish, and Tulalip Tribes) should be important components of any impact-reduction strategy.

5.6.3 Proposed Design Features Intended to Reduce Impacts

The current environmental justice status of Tribal populations based on income remains to be determined. Additional information on these populations, when available, will require review of potentially significant impacts and impact-reduction strategies with respect to qualifying populations.

5.7 PARKS AND RECREATIONAL FACILITIES

This section describes the existing parks and recreational facilities of the subject and surrounding properties and potential environmental impacts thereon. Several state and county parks are identified along with an assessment of the impacts associated with the potential increase in users of those parks due to employees of the Terminal. Issues of concern for park and recreational facilities and uses are:

- Prevention of adverse impacts to park and recreation facilities and uses as a result of construction and operation of the Terminal facility.

5.7.1 Affected Environment

This section describes parks and recreational facilities near the proposed Terminal and presents an assessment of potential impact of Terminal development on those resources. Parks and other recreational facilities near the proposed Terminal are shown in Figure 5-12.

5.7.1.1 *Department of Natural Resources School Lands*

One parcel of land adjacent to the east side of the project property is owned by WDNR. This parcel of land is held in trust by WDNR for the purpose of earning income to fund schools in Washington State. The project does not cross or affect this property in any way and does not impede the ability of the property to earn income for the State.

5.7.1.2 *Lake Terrell Wildlife Area*

Lake Terrell Wildlife Area covers 1,500 acres and is managed by WDFW. The Lake Terrell Wildlife Area is located approximately 10 miles northwest of Bellingham, 5 miles west of Ferndale, and a little less than 1 mile east of the eastern boundary of the project area (Figure 5-12). The man-made Lake Terrell is 500 acres in size, stocked with fish, and known for passive recreation, including bird watching. The shallow lake drains north into Terrell Creek. Approximately 55 acres in the wildlife area are farmed to produce winter forage for migrating waterfowl and other wildlife. Canada geese, trumpeter and tundra swans, pen-raised pheasants (released for hunting), and ducks frequent the area. Boat launches, duck blinds, and other amenities are available for use at the wildlife area.

5.7.1.3 *Birch Bay State Park*

Birch Bay State Park covers 194 acres and is located approximately 2 miles north-northwest of the Gateway Pacific Terminal site, just north of the Cherry Point Aquatic Reserve boundary. The park has 8,255 feet of saltwater shoreline on Birch Bay and 14,923 feet of freshwater shoreline on Terrell Creek. Camping is permitted at the park, and it is one of the largest recreational shellfish areas in the state (WDNR 2010).

5.7.1.4 *Whatcom County Parks*

Point Whitehorn Marine Reserve is located approximately 2 miles northwest of the Gateway Pacific Terminal site. The reserve was opened by Whatcom County in 2009, and includes 54 acres of forest, bluff, beach, and interpretive trails. Uses within the reserve are restricted primarily to passive activities; camping, fires, and pets are not allowed (Whatcom County 2007).

5.7.1.5 *Public Access to the Project Area's Beach*

Public access is allowed currently along the shoreline within the project area, including the beach area adjacent to Gulf Road. Recreational uses include fishing, picnicking, and other passive activities. No public access is allowed along the beach beneath the BP pier just northwest of the project area.

Under the 1999 Settlement Agreement, Pacific International Terminals agreed to convey the saltwater marsh and adjacent lands located on the southwest corner of the property to Whatcom County for park and conservation purposes and to grant, by way of an easement or license, public access to a portion of the property to replace the lost beach access.

5.7.2 Potential Effects on Parks and Recreational Facilities

5.7.2.1 *Construction Effects*

The proposed project would have no impacts on parks and recreational facilities, because construction of the project would only contribute minor numbers of users to the facilities and would not displace any existing parklands. Use of parks and recreational facilities could increase through an influx of construction employees to the area. Based on the anticipated number of construction employees required for the Terminal (see Section 5.4.3 for more information), and the 250,000 estimated users of Whatcom County parks in 2010, construction employees would make up only a small fraction (approximately 0.7 percent) of the total potential users (Whatcom County Parks and Recreation Department 2008).

5.7.2.2 *Operational Effects*

Operation of the proposed project would have no direct effects on parks and recreational facilities. The proposed project is located far enough away from parks and recreational facilities in the vicinity that it would have no impact on their continued ability to operate.

Approximately 430 people would be employed locally at full Terminal buildout. If all employees used the local County Parks, this would contribute approximately 0.0002 percent to Whatcom County's average number of annual park users (Whatcom County Parks and Recreation Department 2008).

Access to the beach from Gulf Road south would not change with Terminal development. However, for security reasons, no access would be allowed near or under the trestle. No physical barrier would be constructed, but the beach area would be posted as private land and security cameras would monitor the area. This would effectively close beach access from the trestle north to BP's pier.

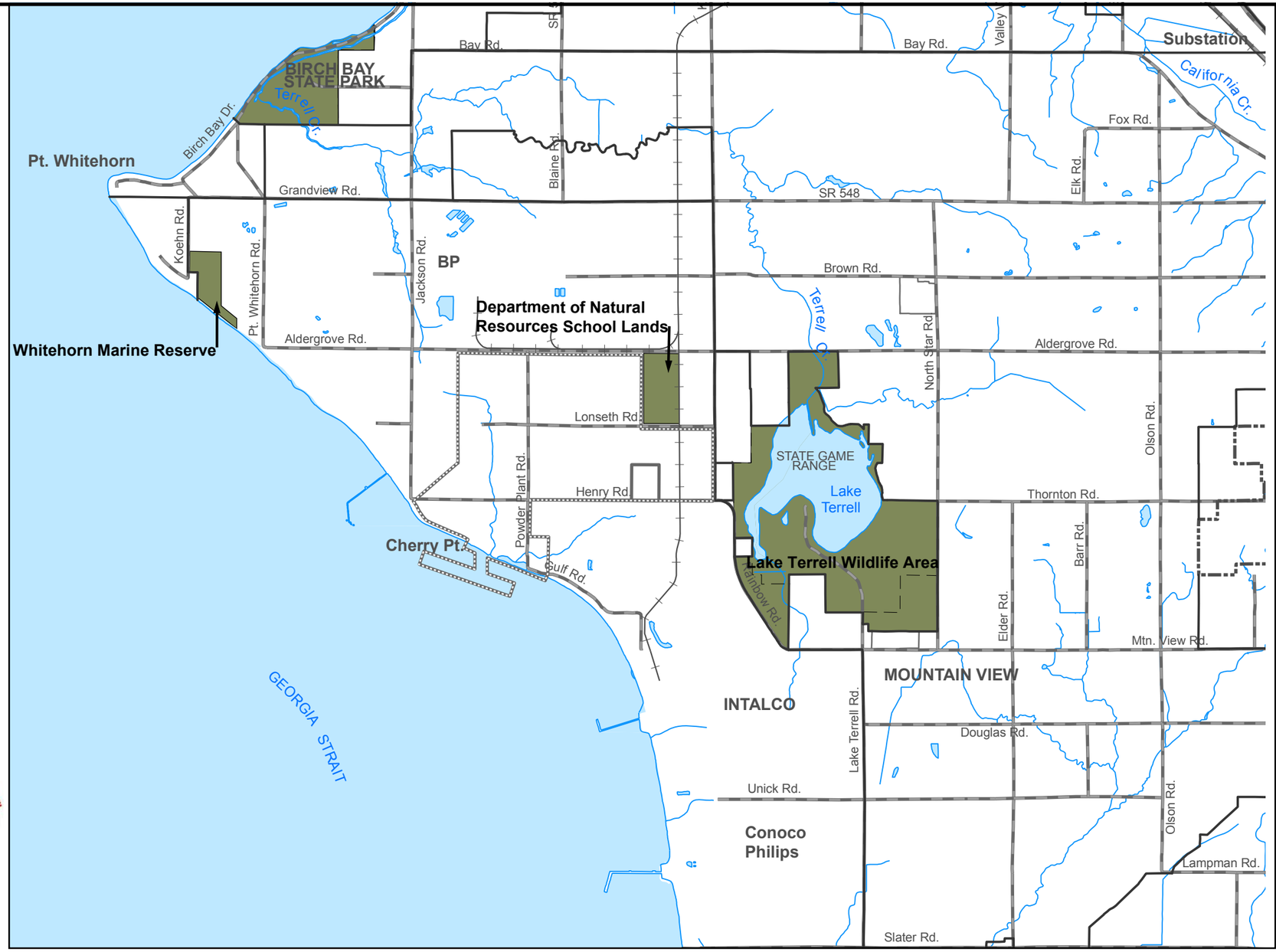
5.7.3 Proposed Design Features Intended to Reduce Impacts

Under the 1999 Settlement Agreement, Pacific International Terminals agreed to convey the saltwater marsh and adjacent lands located on the southwest corner of the property to Whatcom County for park and conservations purposes, and to grant, by way of an easement or license, public access to a portion of the property to replace the lost beach access.

PARK LANDS IN THE VICINITY

Project Area Boundary

Property Boundary



0 0.5 1 2 3 Miles

Image Source: Whatcom County GIS Services

Pacific International Terminals. A Carrix Enterprise

CLIENT:	PACIFIC INTERNATIONAL TERMINALS, INC.
DWN BY:	-dp-
CHK'D BY:	-KD-
DATUM:	
PROJECTION:	
SCALE:	As Shown
PROJECT:	PROPOSED GATEWAY PACIFIC TERMINAL
TITLE:	MAP OF PARK LANDS IN THE VICINITY
DATE:	MARCH 2012
PROJECT NO.:	091515338C-18-01
REV. NO.:	2
FIGURE NO.:	5-12

5.8 PUBLIC SERVICES

This section describes the existing public services, including police, fire, and emergency medical services, serving the project area and vicinity. A discussion of the potential impacts to these services is also included.

Key issues regarding public services include:

- Would the proposed terminal receive public services within established standards and response times? and
- Would operation of the proposed Terminal result in an unacceptable impact on services to other existing public service users?

5.8.1 Affected Environment

5.8.1.1 *Police*

The Terminal would have full-time security personnel responsible as first responders for safety and site security. Video surveillance cameras throughout the project area would support security staff.

When needed, police services would be provided to the Terminal by the Whatcom County Sheriff. The Sheriff's Office also maintains a Division of Emergency Management that handles various aspects of emergency/disaster mitigation, planning, response, and recovery for the community. This division partners with other emergency responders, community volunteers, and other individuals and groups for training, education, plan development, and team building. It is anticipated that the Sheriff's Office Division of Emergency Management would partner with Pacific International Terminals in emergency planning and mitigation.

5.8.1.2 *Fire and Emergency Medical Services*

Terminal security staff would include employees fully trained in specific emergency procedures. These emergency personnel would be trained as first responders for fire and other emergency response scenarios, including medical emergencies.

Gateway Pacific Terminal is located within Fire District No. 7, based in the city of Ferndale. Five of the district's stations could respond to calls from the Terminal. These stations are located near the following intersections:

- Brown and Kickerville Roads;
- Grandview and Koene Roads;
- Northwest and Smith Roads;

- Grandview and Enterprise Roads; and
- Washington Avenue and 3rd Street in Ferndale.

Fire District No. 7 has approximately 20 full-time career responders and 40 volunteer firefighters. The first two stations that would respond to calls to the Terminal would be volunteer stations, with the next two staffed stations.

Fire District No. 7 services 75 square miles with a population of approximately 22,000 people. Fire District No. 7 does not typically provide first response services to the existing industries in the area (BP, Alcoa, and ConocoPhillips), as these industries maintain their own fire teams on site (Hoffman 2011). The District does provide backup and support service to all the industries in Cherry Point, including the three major industrial sites. Service needs for these three industries are similar to what could be required for the Gateway Pacific Terminal project.

5.8.1.3 *Emergency Medical Services*

The nearest emergency medical services to the project area are located at St. Joseph Hospital in Bellingham. St. Joseph is a full service hospital with emergency facilities. St. Joseph Hospital is approximately 17 miles from the project area.

5.8.2 Potential Effects on Public Services

Effects from the proposed project include a potential increase in demand on fire, police, and emergency medical services. While the Terminal would have employees fully trained in specific procedures as first responders for fire and other emergency response scenarios, including medical, the local services would provide backup.

As stated, the Terminal would have full-time security that would be supplemented by surveillance using cameras. Importantly, no access to the Terminal area would be allowed for the general public, so the public area patrolled by the County Sherriff would be reduced.

The Sheriff's Office and St. Joseph Hospital are equipped to provide services to a large geographic area with a mix of residential, commercial, and industrial uses. The addition of the Gateway Pacific Terminal and its employees would create a slight increase in the demand for services, but this is not anticipated to affect services negatively.

The Terminal would not rely solely on Fire District No. 7 to provide emergency fire services. However, it is possible that the District would not have the necessary resources to provide backup for the Terminal safely during the initial commencement of operations (Hoffman 2011).

5.8.3 Proposed Design Features Intended to Reduce Impacts

Additional tax revenue of approximately $11 million annually generated by the Terminal would go to the state and local jurisdictions (see Section 5.4.3 for more information) and could be used to offset increases in demand for fire and emergency services. However, a lag time between when the tax revenues could be directed to the services and when services would be needed is anticipated. Fire District No. 7 anticipates there would be an 18- to 24-month delay due to funding cycles before fire services would be expanded (Hoffman 2011).

5.9 UTILITIES

This section describes the existing utilities serving the subject and surrounding properties and potential environmental impacts thereon. Issues regarding utility services include:

- Ensuring the project would receive utility services within established standards and capacities; and
- Ensuring the project would not result in an unacceptable adverse impact on utility services to other existing utility users.

5.9.1 Affected Environment

5.9.1.1 *Electric Power*

Electrical power is anticipated to be supplied by the Whatcom County Public Utility District Number 1 (PUD). The PUD supplies water and power to the industrial facilities at Cherry Point and has two electrical substations in the project vicinity. The PUD has a power purchase agreement with Bonneville Power Administration (BPA) and currently supplies an average of 27 megawatts per year to the three major industries in Cherry Point. A BPA transmission line, as well as other electrical lines serving the BP Refinery and other industries, runs through the project area. Thus, electric supply is available within the project area, and no new power lines would be needed to supply the Terminal.

Power to the Terminal would be supplied to the Terminal's main substation, which is planned to be located at the northeast portion of the project area. A single connection to the PUD supply is envisioned, and power to all other portions of the Terminal would be routed from the Terminal's main substation.

5.9.1.2 *Water*

The PUD supplies approximately 17 million gallons a day of industrial water to other industries located at Cherry Point and holds rights to 53 million gallons a day. Pacific International Terminals has contract capacity with the PUD for 5.33 million gallons a day of industrial water. Industrial water supply to the project area would be from a new 12-inch underground pipe connected at the existing

industrial water main line (24-inch diameter) located at Aldergrove Road, or from the intertie pipeline (14-inch diameter) at Kickerville Road. The water supply is anticipated to be sufficient for all Terminal operations, including dust suppression. It is also anticipated to be sufficient for fire suppression and safety.

Potable water would be provided from treatment of industrial water with a reverse-osmosis treatment system.

5.9.1.3 *Sewer*

Sanitary sewage on the site would be processed in a packaged treatment plant and discharged to a septic field adjacent to the office buildings. For the washroom facility on the wharf, the sanitary sewage would be treated on site and trucked off site.

5.9.1.4 *Natural Gas*

The Gateway Pacific Terminal would not use natural gas.

5.9.1.5 *Telecommunications*

Landline telephone services are provided by Qwest and Verizon in the project vicinity; cable television services are provided by Comcast; internet services are provided primarily by Comcast and Verizon; and cellular telephone services are provided by a wide range of providers.

Excluding proprietary information for some of the service providers, the availability of services is high and due to their nature, any supply shortages are easily rectified (City of Ferndale 2007).

5.9.2 Potential Effects on Utilities

5.9.2.1 *Electric Power*

Effects on electric power would be an increased demand for services. Existing capacity appears to be sufficient for the Terminal and is not anticipated to affect utility providers or their other customers negatively.

5.9.2.2 *Water*

Effects on water would be an increased demand for services. Existing capacity appears to be sufficient for the Terminal and is not anticipated to affect utility providers or their other customers negatively.

5.9.2.3 *Sewer*

Sanitary sewage would be treated and handled on site and would not affect utility providers in the area.

5.9.2.4 *Telecommunications*

Effects on telecommunications would be an increased demand for services. Capacity appears to be able to be added as needed by service providers and is not anticipated to negatively affect them or their other customers.

5.9.3 Proposed Design Features Intended to Reduce Impacts

No design features to reduce impacts are proposed for the use of utilities by the Gateway Pacific Terminal project.

5.10 RELATIONSHIP TO OTHER PLANS AND POLICIES

This section describes the existing federal, state, and local plans and policies pertinent to the project area and surrounding properties. An overview of the plans is provided, as well as a discussion of whether the project is consistent with each of these plans.

The primary focus is to confirm that construction and operation of the Terminal supports existing federal, state, and local plans and policies. If this is not the case, then a discussion of why it is not the case is provided.

5.10.1 Affected Environment

5.10.1.1 *Federal Policies*

National Export Initiative

In response to the recent downturn in the economy, President Obama issued the National Export Initiative on March 11, 2010, to facilitate job creation through increased exporting. Through active participation in international markets, the Administration has a goal of doubling the country's exports within the next 5 years (Office of the President 2010). The Gateway Pacific Terminal project would contribute to meeting the Administration's goal by exporting coal, potash, and other commodities. The Terminal would create many jobs, as described further in Section 5.4.3.

National Security Policy

In May, 2010, the Obama Administration issued the National Security Policy addressing multiple ways in which the US could renew its role as a world leader and enhance safety and security for the nation. The National Security Policy views cultivation of strengths and influence in the global market as one of the key ways in which this leadership can be obtained. Specific strengths identified included economic competitiveness, engagement in a globally growing economy, seeking out mutual economic interests with other nations, and maintaining existing economic relationships around the world. The proposed Terminal is consistent with and supports the National Security Policy by creating economic relationships with other countries through the export of commodities.

5.10.1.2 *State Policies*

Governor's Export Policy

Governor Christine Gregoire issued the Washington State Export Policy on June 22, 2010, to complement the National Export Initiative. Governor Gregoire committed Washington State resources to partnering with the US Department of Commerce to achieve President Obama's goal of doubling exports by the year 2015. Washington State has strong abilities as an exporter and can leverage these existing strengths to further increase exports and the number of jobs that are tied to those exports. Washington currently has the highest per capita export rate in the US, and 4 percent of companies export, compared with a national average of 1 percent. One out of every three jobs is tied either directly or indirectly to trade in the State. Through a combination of strengthening relationships with overseas partners and engaging with the federal government in infrastructure investments, Washington State would increase its role in exporting. Specifically, the Governor would like to see $600 million in new exports and the number of companies exporting increase by 30 percent (Office of the Governor 2010).

The proposed Terminal is consistent with and supports the Governor's Export Policy in the same way it supports the National Export Policy, by increasing exports to other nations and by increasing jobs locally.

Cherry Point State Aquatic Reserve

The WDNR finalized the Cherry Point Aquatic Reserve Management Plan in 2010. The plan identifies natural resources existing within the boundaries of the reserve, proposed uses, potential risks, and management actions to regulate those uses and protect resources. Development of the Aquatic Reserve Management Plan began in 2007, when WDNR brought together a group of stakeholders, called the Cherry Point Workgroup, to assist with managing the area. The Workgroup gathered technical information and provided recommendations for managing the approximately 227 acres of tidelands. Cherry Point is viewed as a unique environment to balance multiple features, including natural habitats and deep-water access for industrial use. According to WDNR, the management emphasis for new authorizations on state-owned lands will place protection of native aquatic habitats above all other management actions. For existing uses located on state-owned aquatic lands directly adjacent to the reserve, the focus will be to reduce their existing impacts over the 90-year time frame of the reserve's plan.

The reserve was established in 2000 by WDNR with state-owned lands. The boundary of the Reserve extends 5,000 feet beyond the marine shoreline to include all tidelands and marine area to the depth of -70 feet below MLLW (Figure 5-13). The reserve faces a number of threats, including:

- shoreline modifications, such as overwater structures, loss of riparian vegetation, armoring, and derelict gear;
- pollution from groundwater contamination, stormwater runoff, point discharges, and air deposition;
- disturbance from recreation;
- artificial light and excessive intermittent sound;
- vessel traffic and oil spills;
- invasive species; and
- habitat impacts due to climate change.

WDNR identified the four existing industrial uses within the reserve and identified the proposed use for the Gateway Pacific Terminal project. Existing uses are the industrial piers at BP, Intalco, and ConocoPhillips, and the outfall for the Birch Bay Water and Sewer District. The Aquatic Reserve Management Plan discusses specific requirements for modifications or extensions to use authorizations for these existing users. The Aquatic Reserve Management Plan gives specific reference to the new trestle and wharf for the Gateway Pacific Terminal project:

> "…the additional new pier must meet the requirements of this Management Plan, serve the objectives of the Reserve, meet all regulatory requirements, and conform to the terms and conditions of the 1999 Settlement Agreement." (WDNR 2010, p. 51)

The 1999 Settlement Agreement provided a number of conditions for Terminal development and operations. In addition, the Aquatic Reserve Management Plan stated that the Gateway Pacific Terminal would need to meet the following conditions:

- Identify impacts to salmon and herring due to artificial light and noise, and incorporate findings into an operations plan that minimizes impacts;
- Design structures to avoid disruption to herring migration patterns;
- Design the trestle and wharf to minimize wave and light shading;
- Complete vessel traffic studies and evaluate traffic management needs; and
- Avoid impacts to wave energy, nearshore sediment drift, and aquatic and riparian vegetation.

Additional conditions and requirements are included in the Aquatic Reserve Management Plan for new discharge outfalls. Because the preliminary design for the Terminal does not incorporate new

outfalls, the requirements are not applicable; however, if the design were revised to include new outfalls, the requirements listed in the Aquatic Reserve Management Plan would need to be met.

The Aquatic Reserve Management Plan identifies five goals to promote desired future conditions of the reserve:

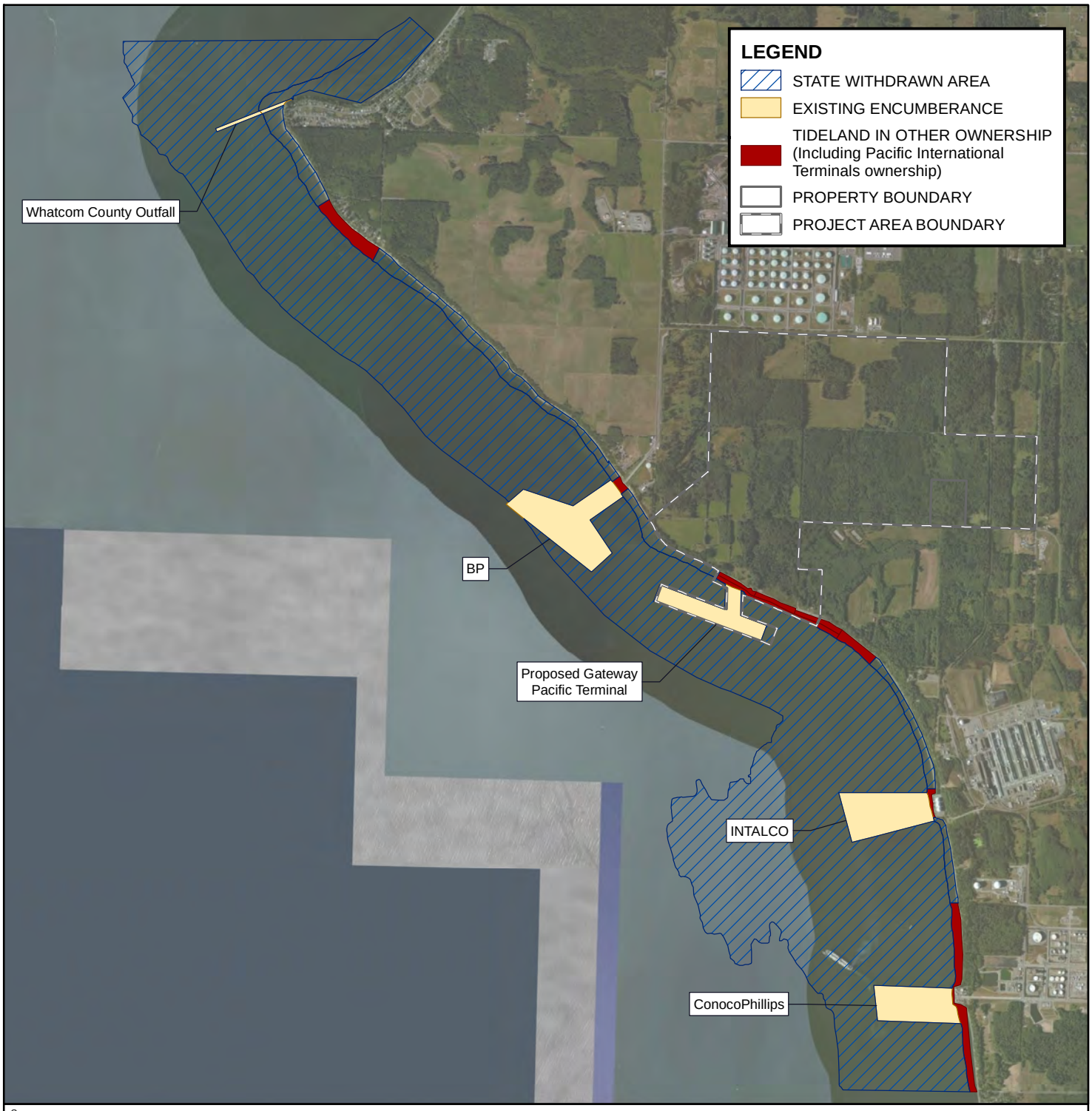
1. Identify, protect, restore, and enhance aquatic nearshore and subtidal ecosystems;
2. Improve and protect water quality and habitat;
3. Protect and help recover indicator fish and wildlife species and habitats;
4. Facilitate stewardship of habitats and species; and
5. Identify, respect, and protect archaeological, cultural, and historical resources.

To address potential risks to the reserve and to seek to meet goals and objectives, the Aquatic Reserve Management Plan identifies specific management actions grouped in the following categories: protection and conservation; enhancement and restoration; outreach and education; monitoring, data collection, and research; allowed uses; and prohibited uses.

Pacific International Terminals will collaborate with WDNR and other agencies to help achieve specific goals that:

- Protect existing native vegetation on the bluff;
- Provide public beach access near Gulf Road;
- Develop strategies to deal with ballast water;
- Minimize new sources of nonpoint pollution;
- Reduce the discharge of (untreated) stormwater;
- Develop a management plan regarding non-native species; and
- Implement measures from the Northwest Ports Clean Air Strategy.

In addition, Pacific International Terminals will participate in monitoring, data collection, and research goals by providing relevant information.



Source:
'State withdrawn area', 'Existing encumberance' and 'Tideland in other ownership' data obtained from Washington Department of Natural Resources on 11/03/2010:
http://fortress.wa.gov/dnr/app1/dataweb/dmmatrix.html

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Feet

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Pacific International Terminals

CLIENT:
PACIFIC INTERNATIONAL TERMINALS, INC.

PROJECT: PROPOSED GATEWAY PACIFIC TERMINAL

TITLE: CHERRY POINT AQUATIC RESERVE BOUNDARY

DWN BY:	DATUM:	DATE:
SD	NAD83	MARCH 2012
CHK'D BY:	REV. NO.:	PROJECT NO.:
KD	1	091515338C-18-01
PROJECTION:	SCALE:	FIGURE No.:
WA SP North, Ft.	1 inch=4,000 feet	FIGURE 5-13

K:\AMEC US OFFICES\KIRKLAND\15338-0\15338C\T-18-00 - Environmental Information Document\dwg\Revised\Figure 5-13 - Cherry Point Aquatic Reserve Boundary.mxd

Finally, implementation of key factors of the Aquatic Reserve Management Plan, as described in the plan, includes identifying coordination with community groups; funding; and adaptive management. The Technical Advisory Committee (a subcommittee of the Cherry Point Workgroup) noted:

> "…while initially disturbing, industrial development associated with the piers appears to be compatible with aquatic reserve status and noted the opportunity to facilitate multiple-uses as an example where commercial activities and environmental resources can co-exist." (WDNR 2010, p. 8)

The proposed Terminal is consistent with and supports the Cherry Point Aquatic Reserve Management Plan by complying with and implementing the protection measures found therein.

Puget Sound Harbor Safety Plan

The Puget Sound Harbor Safety Committee has established the Puget Sound Harbor Safety Plan (most recently revised in July, 2009) as a guide to "good marine practices" specifically adapted for the Puget Sound region. The guide does not seek to supplant any existing regulations, but instead to complement and supplement federal, state, and local laws and regulations with guidelines that are non-regulatory in nature.

The Puget Sound Harbor Safety Plan supports and enhances safety and environmental stewardship in the region based on the experience of those familiar with the unique conditions of Puget Sound. The plan is targeted specifically to professional mariners transiting through navigable waters of the Puget Sound region and approaches from the sea. The US Coast Guard's Captain of the Port, Ecology policies, and a traffic separation scheme approved by the International Maritime Organization govern these waters.

Recommendations found in the Puget Sound Harbor Safety Plan consist of using caution when relying on aids to navigation. Varying degrees of accuracy exist for aids to navigation, which preclude relying on any one aid when navigating. An *Advance Notice of Arrival* process asks for 96 hours of advance notice prior to arrival at a US port. The Coast Guard analyzes the *Advance Notice of Arrival* for safety and security purposes and may inspect the vessel if there are any concerns. This process may change in the near future, as the Coast Guard is currently working on expanding the process. An automatic identification system is installed on certain categories of vessels and is used principally for identifying and locating vessels. Finally, in case of emergency, the plan directs vessels in appropriate reporting actions based on the type of emergency that has occurred.

The Puget Sound Harbor Safety Plan is applicable to the project because the *Advance Notice of Arrival* requirements apply to commercial vessels greater than 300 gross tons and to all foreign

vessels. The automatic identification system is also applicable to the project based on the large ships that would access the Terminal.

The proposed Terminal is consistent with and supports the Puget Sound Harbor Safety Plan by complying with the policies therein.

5.10.1.3 *Whatcom County Countywide Planning Policies*

Countywide Planning Policies establish a countywide framework for developing and adopting county and city comprehensive plans. These comprehensive plans are the long-term policy documents used by each jurisdiction to plan for its future. They include strategies for land use, housing, capital facilities, utilities, transportation, economic development, and parks and recreation (RCW 36.70A.070). The role of the Countywide Planning Policies is to coordinate comprehensive plans of jurisdictions in the same county for regional issues or issues affecting common borders (RCW 36.70A.100).

As such, most of the policies in the Countywide Planning Policies have to do with future planning and interjurisdictional coordination. A few, however, have some bearing on the Gateway Pacific Terminal project:

- **Policy E.3:** Cherry Point shall be designated as an unincorporated industrial urban growth area in recognition of existing large-scale industrial land uses. Additional large-scale development shall be encouraged consistent with the ability to provide needed services and consistent with protecting critical areas along with other environmental protection considerations. The Cherry Point industrial area is an important and appropriate area for industry due to its access to deep-water shipping, rail, all-weather roads, its location near the Canadian border, and its contribution to the County's goal of providing family wage jobs.
- **Policy I.8:** Economic development should be encouraged that: a) does not adversely impact the environment; b) is consistent with community values stated in local comprehensive plans; c) encourages development that provides jobs to county residents d) addresses unemployment problems in the county and seeks innovative techniques to attract different industries for a more diversified economic base; e) promotes reinvestment in the local economy, and f) supports retention and expansion of existing businesses.
- **Policy I.11:** Whatcom County encourages siting of industrial uses in proximity to and to further utilization of our access to deep water and port facilities for shipping, rail, airports, roadways, utility corridors and the international border.

The proposed Terminal is consistent with and supports the Whatcom County Countywide Planning Policies, and complies with the pertinent policies therein.

5.10.2 Project Effects on Relationship to Plans and Policies

The Terminal is consistent with export, job creation, and international goals found in the national and state export initiatives, and effects on those plans and policies would be positive.

The proposed project is consistent with the Puget Sound Harbor Safety Plan. Since this is an advisory document, it would influence the operating procedures of the Terminal.

The Terminal is consistent with the Cherry Point Aquatic Reserve Management Plan. The project is identified specifically in the plan, and the location for the proposed Gateway Pacific Terminal wharf and trestle was not included within the reserve footprint. Once required studies are undertaken and mitigation measures are implemented, the proposed project would comply with the management expectations stated in the Aquatic Reserve Management Plan.

The Washington State Transportation Plan identifies shortages of rail capacity as a limitation in providing the level of service necessary to meet expected growth within the state transportation network.

5.10.3 Proposed Design Features Intended to Reduce Impacts

No design features to reduce impacts are proposed for impacts to plans and policies as no impacts are anticipated.

5.11 Other Resource Areas to Be Addressed at a Later Date

5.11.1 Energy

Energy has not been evaluated for the proposed Terminal, nor was it addressed in the 1996 EIS. If energy is identified as an issue of concern during the upcoming EIS scoping process, then it will be addressed.

5.11.2 Aesthetics

Aesthetics has not been re-evaluated for the current proposed Terminal. The 1996 Draft EIS included a discussion of aesthetics, summarized as follows:

- Views from the project site include some of the San Juan Islands, Lummi Island, dock structures of Intalco, BP, and Tosco (now ConocoPhillips), and some of the associated upland development. The project area itself was visible from the surrounding industrial properties, and possibly from the islands mentioned. Portions of the project area are also visible from the public access beach on Gulf Road, from Henry Road, and by passing watercraft. No residential users have views of the project area (Whatcom County 1996).

- The project would alter the visual character of the site from farmed land to industrial components. Storage buildings, covered conveyors, and rail access would characterize the industrial nature of the property. Marine structures, including the trestle and wharf and conveyor system, would require some portions of the bluff to be cleared and may provide some additional view of upland structures from the beach. However, existing vegetation may provide some screening of upland structures from the beach. The trestle, wharf, and ships accessing the wharf would be visible from the water to a distance of approximately 1 mile. Lighting on the trestle and wharf would make this also visible at night. Aesthetic values of the beach would be decreased due to the trestle and wharf structure dominating any views from the beach (Whatcom County 1996).

If aesthetics are identified as an issue of concern during the upcoming EIS scoping process, then this issue will be further addressed.

5.11.3 Light and Glare

Light and glare have not been re-evaluated for the current proposed Terminal. Key findings from the discussion of light and glare in the 1996 Draft EIS are summarized below:

- Existing sources of light and glare in the project area included industrial developments to the southeast and north of the project area and industrial rail traffic and road traffic. No existing sources of light or glare exist on the project site (Whatcom County 1996).
- The proposed project would generate light and glare from the trestle and wharf, upland facilities, and ships at berth. Lighting at the terminal would be most visible from the water and islands within visual range of the project area. The Terminal would operate day and night, producing light at all times (Whatcom County 1996).
- Mitigation measures in the 1996 Gateway Pacific Terminal Final EIS included the use of directional shielding on lights where possible to lessen the light viewed from other locations, avoiding reflective surfaces on structures, preserving natural vegetation on the bank and immediately north of the beach to reduce impacts, and reintroducing cedar trees to provide screening (Whatcom County 1996).

If light and glare are identified as an issue of concern during the EIS scoping process, then it will be further addressed.

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