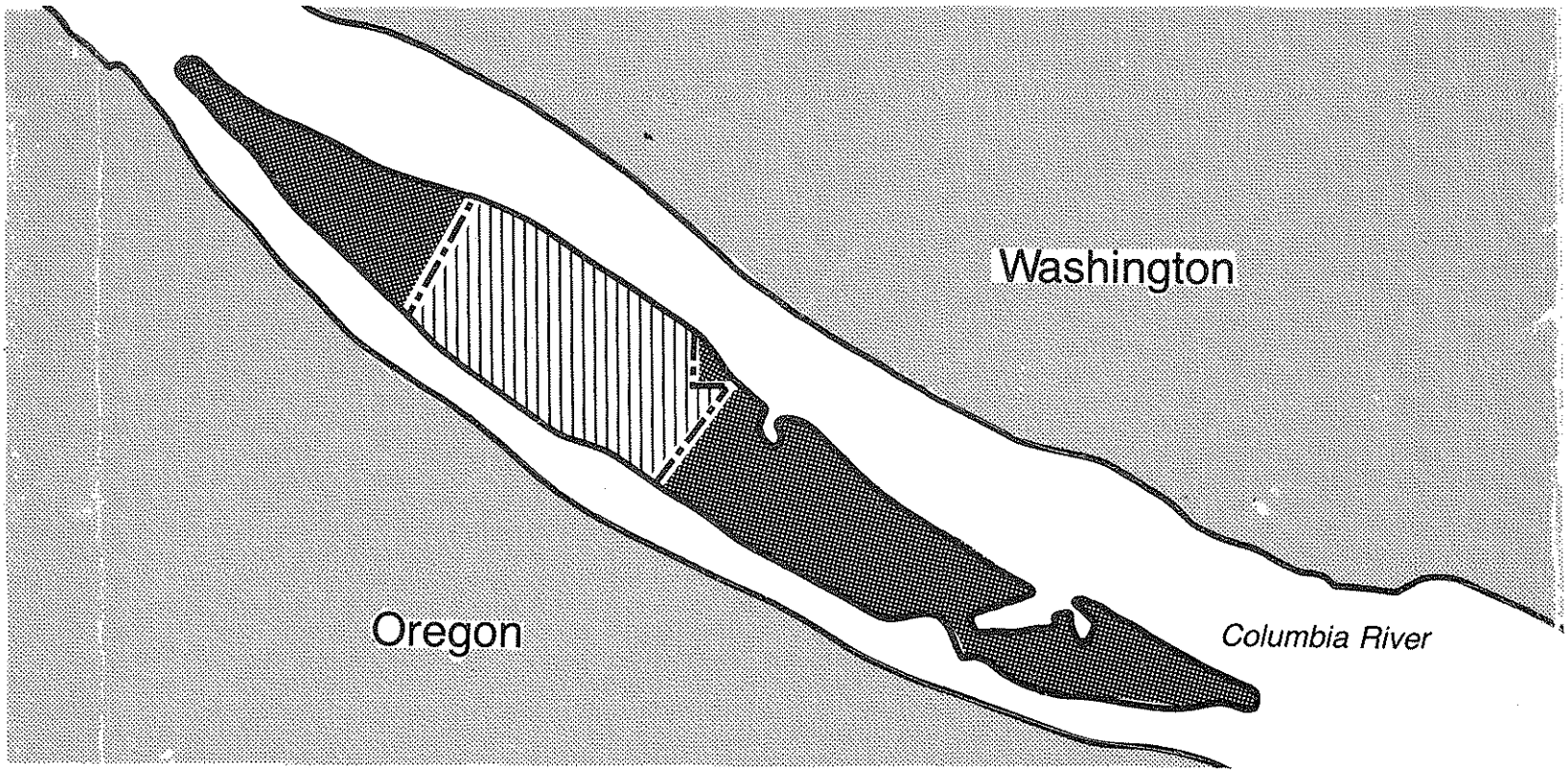
FINAL ENVIRONMENTAL IMPACT STATEMENT

West Hayden Island Marine Industrial Park

Portland, Oregon

1987



US Army Corps
of Engineers
Portland District

Portland General Electric Company

Permit Application No. 071-OYA-2-005254

DEPARTMENT OF THE ARMY
PORTLAND DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2946
PORTLAND, OREGON 97208-2946

Reply to
Attention of:

DEC 29 1986

Planning Division (PL-NR-EQ)

Dear Reviewer:

Enclosed for your review and comment is the Final Environmental Impact Statement (FEIS) for Portland General Electric Company's proposed West Hayden Island Marine Industrial Park in Portland, Oregon. This document has been prepared in compliance with the National Environmental Policy Act (NEPA). The Portland District, U.S. Army Corps of Engineers is the lead agency for the EIS under NEPA; the U.S. Coast Guard is a cooperating agency. The Corps' jurisdiction is based on the regulatory authorities contained in Section 10 of the River and Harbor Act of 1899 and Section 404 of the Clean Water Act of 1977; the Coast Guard's jurisdiction is based on Section 9 of the River and Harbor Act of 1899.

Copies of the FEIS are being filed with the U.S. Environmental Protection Agency, and are being sent to other interested Federal, State, and local agencies, and private organizations and members of the public who have requested copies.

The permit application is also discussed in Corps of Engineers Public Notice No. 071-0YA-2-005254. Comments on this document may be sent to the above address, ATTN: NPPPL-NR-EQ. Comments should be received within 30 days of announcement in the Federal Register that the EIS has been filed with the Environmental Protection Agency. Federal Register announcement is expected to occur on January 16, 1987. Should no response be received within the 30 day period, a no-comment response will be assumed.

Sincerely,

Gary R. Lord
Colonel, Corps of Engineers
District Engineer

Enclosure

FINAL ENVIRONMENTAL IMPACT STATEMENT

WEST HAYDEN ISLAND

MARINE INDUSTRIAL PARK

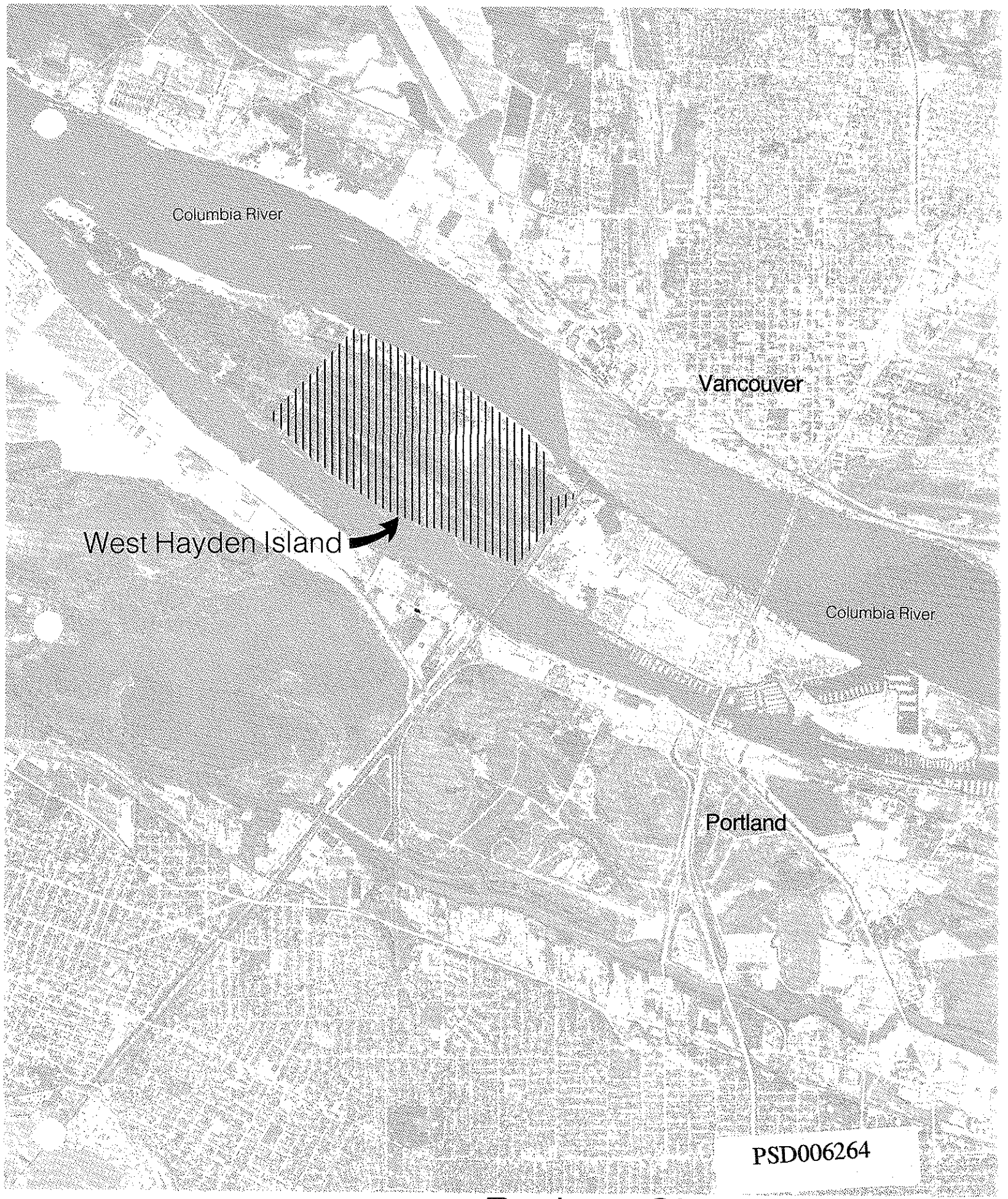
Portland, Oregon

1986

U.S. Army Corps of Engineers - Portland District

Portland General Electric Company

Permit Application No. 071-OYA-2-005254



PSD006264

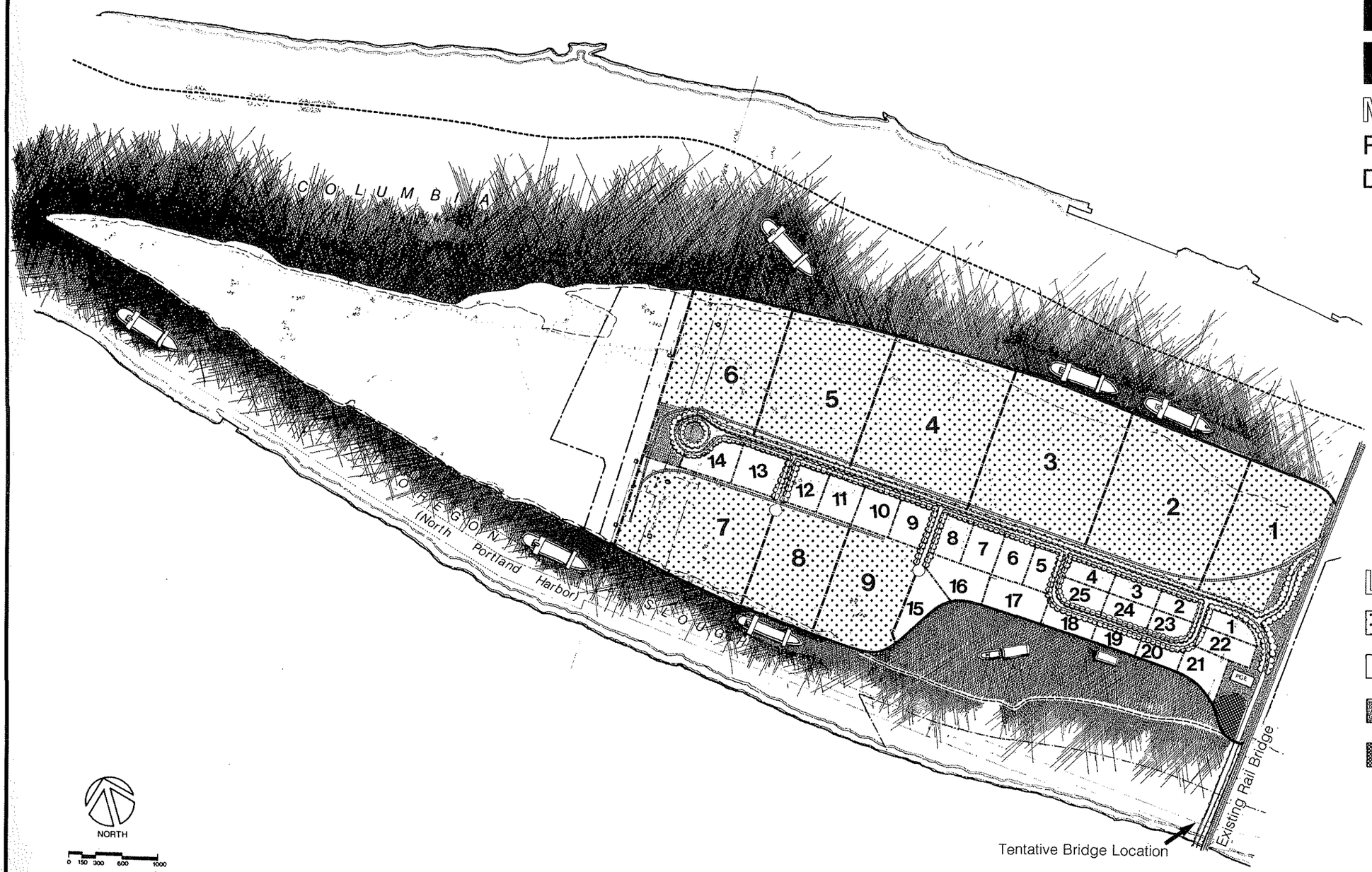
Project Site and Vicinity

Portland General Electric

HAYDEN ISLAND

MASTER PLAN

PROPOSED
DEVELOPMENT PLAN



LEGEND

- **Marine Terminal Berths** 9 Sites - 357 acres
- **Industrial Warehouse Sites** 25 Sites - 94 acres
- **Undeveloped Land** 4.6 acres
- **Preserved Wetlands** 3.3 acres

NORTH

0 150 300 600 1000

PROPOSED DEVELOPMENT PLAN

Benkendorf Associates
Ogden Beeman & Associates

PSD006265

FINAL ENVIRONMENTAL IMPACT STATEMENT
WEST HAYDEN ISLAND MARINE INDUSTRIAL PARK
PORTLAND, OREGON

Lead Agency: U.S. Army Corps of Engineers, Portland District

Cooperating Agency: U.S. Coast Guard, Thirteenth Coast Guard District, Seattle, Washington

Permit Applicant: Portland General Electric Company

Permit Authorities: Section 10, River and Harbor Act of 1899
Section 404, Clean Water Act

Abstract: Portland General Electric Company (PGE) has applied to the Portland District Corps of Engineers for a permit under the authorities listed above to dredge in navigable waters of the United States and to fill in wetland areas. Material, primarily sand, would be dredged from the Columbia River and used to fill a 496-acre site on West Hayden Island above the 100-year flood elevation, making it suitable for development as marine industrial sites. Approximately 2 million cubic yards (mcy) of the required fill material would come from dredging in the Columbia; the remaining 6.5 mcy would come from the project site, by excavating a 64-acre area to a depth of up to -45 feet Columbia River Datum (CRD), creating an aquatic basin adjacent to the Oregon Slough. Basin excavation would occur out to the existing channel in the Oregon Slough. Dredging will affect approximately 35.5 acres of shallow water habitat adjacent to the basin and 3.1 acres in the authorized channel of the Oregon Slough. The proposed development would also include construction of a bridge over the Oregon Slough, extension of utilities to the site, and construction of on-site land transportation facilities. Alternatives which were considered included alternative locations for the proposed development and alternative site development plans. No alternative site was found in the Portland-Vancouver area which could meet the need for future marine industrial development. Six alternative site development plans were considered, but three were rejected because they were not economically feasible or environmentally acceptable. Therefore, only three development alternatives are considered in detail in this FEIS along with the no action alternative. Major environmental effects of this project would result from both dredging and filling. Benthic habitat and organisms would be destroyed by the dredging; up to 77 acres of wetlands would be filled, requiring off-site mitigation; other terrestrial habitat such as cottonwood-ash riparian habitat would also be filled; the natural appearance of West Hayden Island would be replaced by man-made features and industrial development; and traffic would increase on local streets and highways in the vicinity.

SEND YOUR COMMENTS TO THE DISTRICT ENGINEER BY _____.

If you would like further information on this statement, please contact:

Mr. Eric Braun
U.S. Army Corps of Engineers,
Portland District
PO Box 2946
Portland OR 97208-2946

Telephone: (503) 221-6096

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

GLOSSARY OF ACRONYMS/ABBREVIATIONS

AAHU - Average Annual Habitat Unit

ACDP - Air Contaminant Discharge Permit

ANSI - American National Standards Institute

BPA - Bonneville Power Administration

CFR - Code of Federal Regulations

cm - centimeter

cy - cubic yards

CRD - Columbia River Datum

Corps - U.S. Army Corps of Engineers

DEIS - Draft Environmental Impact Statement

DEQ - Department of Environmental Quality

FEIS - Final Environmental Impact Statement

FHA - Federal Highway Administration

HEC-2 - Hydrologic Engineering Center - Program No. 2

HEP - Habitat Evaluation Procedures

HSI - Habitat Suitability Index

HU - Habitat Unit

I-5 - Interstate 5

LCDC - Land Conservation and Development Commission

µg - microgram

mm - millimeter

mcy - million cubic yards

MSL - mean sea level

Metro - Metropolitan Service District

NGVD - National Geodic Vertical Datum

NOAA - National Oceanic and Atmospheric Administration

NPDES - National Pollutant Discharge Elimination System

NSPS - New Source Performance Standards

NSR - New Source Review

OAR - Oregon Administrative Rules

ODFW - Oregon Department of Fish and Wildlife

PGE - Portland General Electric Company

PIA - Portland International Airport

PIAQMA - Portland Interstate Air Quality Maintenance Area

PSD - Prevention of Significant Deterioration

PSEL – Plant Site Emission Limits

RM – River Mile

SEC – Significant Environmental Concern

TSP – Total Suspended Particulate

TY – Target Year

UGB – Urban Growth Boundary

USSCS – U.S. Soil Conservation Service

VOC – Volatile Organic Compounds

SUMMARY

Major Conclusions and Findings. Portland General Electric Company (PGE) has applied for a Department of the Army permit to do work in waters of the United States and adjacent wetlands. The permit would be for dredging material from the Columbia River and excavating a portion of West Hayden Island adjacent to the Oregon Slough under the authority of Section 10 of the River and Harbor Act of 1899 and for discharging this material onto West Hayden Island, including wetland areas under the authority of Section 404 of the Clean Water Act. Two of the proposed alternatives would include an excavated basin of approximately 40 to 64 acres on the south side of the island. The area between this basin and the existing navigation channel in the Oregon Slough would be dredged to a maximum of -45 feet Columbia River Datum (CRD) eliminating approximately 38.6 acres of shallow water habitat. The proposed development would also include construction of a bridge over the Oregon Slough (subject to a U.S. Coast Guard permit under the authority of Section 9 of the River and Harbor Act of 1899), extension of utilities to the site, and construction of on-site land transportation facilities.

The purpose of this work would be to provide access to the site for deep-draft vessels and to provide flood protection to PGE's property to an elevation above the 100-year floodplain to make it suitable for marine industrial development. The need to provide sites in the Portland metropolitan area for future marine industrial development is documented in the Multnomah County Comprehensive Plan.

Alternatives which were considered included alternative locations for the proposed development, alternative site development plans, and a no-action alternative. No alternative site was found in the Portland-Vancouver area which could meet the need for future marine industrial development. The no action alternative features the expansion of cattle grazing activities.

There will be 3 to 4 million cubic yards (mcy) of fill material available from the construction of a new lock at Bonneville Dam. With permit approval, West Hayden Island would be a potential disposal site for the material. The final decision concerning the disposal of the material, however, will be made by the contractor who is selected for the construction of the new navigation lock.

Physical Effects. Filling at the site would change the local topography, resulting in the perimeter of the site being filled to an elevation of +31 feet National Geodic Vertical Datum (NGVD). Interior areas subject to ponding would be filled to a minimum elevation of +24 feet NGVD, with the fill sloping inward from the perimeter levees. Two of the development alternatives would result in major changes to the southeast quadrant of the site, where a basin of up to 64 acres would be excavated to provide fill for the remainder of the site. A 45-foot navigation access channel would be dredged from the existing Columbia River 40-foot channel to the north shore of the PGE site, with a 1,000-foot turning basin at the west end. Material dredged from the river and the Oregon

Slough would provide approximately 2 mcy of fill material. Water quality would be affected by dredging with temporary increases in turbidity. Dredged material is expected to be primarily clean sand. Some filling would occur in the floodway of the Columbia River; however, the increase of flood heights due to the fill would comply with Federal Emergency Management Agency criteria. Air quality changes would result from future marine industrial development at the site; however, these changes cannot be identified at this time.

Industries locating on West Hayden Island would be subject to air quality regulations. A review of the existing regulations indicates that new source growth at this site is possible.

Biological Effects. Existing vegetation would be removed from the site and up to 76.5 acres of wetlands would be filled. With the applicant's preferred alternative, three acres of wetlands would remain undeveloped. Wildlife would be directly affected by loss of habitat at the site and from increased human activity in the area. A Great Blue Heron rookery exists nearby at Delta Park; development at the West Hayden Island site would reduce the acreage of habitat available for this species. PGE has established a Habitat Evaluation Procedures (HEP) committee to assess and quantify the wildlife habitat values which would be lost at the site. Results of the HEP study indicate low values for existing wetlands and relatively high wildlife values for riparian habitat on the island. The findings of this study will be used to develop a mitigation plan for the wetlands and other habitats which would be filled.

Aquatic organisms would be affected by initial dredging, maintenance dredging, future alteration of existing shoreline, placement of offshore structures by future site developers, ship traffic, and potential water pollution from accidental spills and surface runoff. Dredging a ship access channel to -45 feet CRD, leaving a predominantly sand substrate, would result in a decrease of existing bottom fauna. If existing conditions are indicators, a 40 to 60 percent reduction in total organisms could be expected. The main impact of dredging on juvenile salmonids would be the disruption or delay of downstream migration due to increased turbidity and the actual physical equipment and activities in the river. To avoid impacting downstream migrations of the important salmonid juveniles, dredging would not occur during their migration period of March, April, May, and June. To avoid impacts to spring chinook smolts, dredging would also be curtailed in November. Avoidance of dredging in the spring would also minimize potential impacts to spawning activities of nonmigratory fish species (eg, bass, sunfish).

No threatened or endangered species occur on West Hayden Island.

Social and Economic Effects. The proposed development is consistent with the Multnomah County Comprehensive Plan, which has been acknowledged by the Oregon Land Conservation and Development Commission. The county plan limits development at this site to marine industrial uses. Benefits to the local and regional economy from marine industrial development include an estimated 658 to 1,469 jobs and an increased local tax base.

Increased traffic in the local area would result from future development at the site. A bridge would be constructed from the site across the Oregon Slough to North Marine Drive to route industrial traffic away from the residential/commercial developments on East Hayden Island. The City of Portland and the Federal Highway Administration are developing plans for the extension of North Marine Drive into the Rivergate industrial area. These improvements would connect West Hayden Island to the interstate freeway system and major local arterials. Increased river traffic would also result from future development at this site.

The visual character of West Hayden Island would be changed from natural vegetation to industrial facilities. Noise levels in the immediate area would increase, depending on the size and type of development. Light and glare would increase and would affect residents of two houseboat developments on the Oregon Slough.

Cultural resource investigations of the site were conducted, and the results coordinated with the Oregon State Historic Preservation Officer. No significant evidence of prehistoric or historical occupation were found (Ellis, 1986). Native use of the island was probably limited, producing little archeological data. No significant cultural resources have been identified which would be affected by the proposed marine industrial development.

Areas of Controversy. Primary issues of concern identified during the scoping process include the discussion of development alternatives, the need for mitigation, impacts to anadromous and resident fish, impacts to wetlands, and impacts to local transportation systems. Other important issues are water quality, sediment transport, cottonwood-ash riparian habitat, and wildlife.

Unresolved Issues. Implementation of a development plan would result in the filling of up to 76.5 of the 79.5 acres of wetlands on West Hayden Island. Mitigation for the loss of these wetlands is required. To assess and quantify the biological values of the wetlands which would be lost, the applicant has established a HEP committee. Based on the findings of this committee and selected development alternatives, a detailed mitigation plan will be developed. Proposed mitigation measures for aquatic species and habitat will emphasize minimizing adverse impacts.

1.0 Purpose and Need

1.0 PURPOSE AND NEED

1.1 Applicant's Purpose and Need

Portland General Electric Company (PGE) has applied to the Portland District U.S. Army Corps of Engineers for a permit (Permit Application No. 071-OYA-005254) to dredge in navigable waters and to fill in wetland areas. PGE's purpose is to develop its 496-acre property on West Hayden Island. The site is currently used for grazing, and PGE proposes to develop it for marine industrial use in accordance with the Multnomah County Comprehensive Plan. The permit is needed to create access to the 40-foot shipping channel and to provide flood protection for the development. This development would be water dependent and meet community needs in providing increased employment opportunities and an increase in the local tax base.

1.2 Public Purpose and Need

Virtually every proposal to improve the economy of the nation and the Northwest includes a need to expand foreign trade. The continued growth and expansion of this economic sector will require substantial amounts of vacant land in the Portland-Vancouver area. In 1982-83, PGE conducted an extensive study of West Hayden Island and of the need to provide for future expansion of marine industrial development in the Portland metropolitan area. Over 40 government agencies, individuals, and organizations participated in this study. It was determined that the need exists for approximately 1,000 acres of land for future marine industrial use and that West Hayden Island is the only major land parcel available to meet approximately 50 percent of this need (Cogan, 1982). This is based on the property's location on the 40-foot channel and its accessibility to required urban services at a reasonable cost.

The first step toward meeting this need was to obtain Multnomah County's approval of a change to the comprehensive plan designation; the second step was to obtain the Metropolitan Service District's (Metro) approval of an Urban Growth Boundary (UGB) amendment to allow urban uses. Both of these actions were unanimously approved by the respective commissioners and councilors based on a demonstrated need to expand marine industrial development in the Portland area. Strict limitation to marine industrial uses was a condition of both approvals. The Oregon Land Conservation and Development Commission (LCDC) concurred with these decisions.

The combination of these government actions is the strongest statement of public policy and purpose on this subject possible without action of the state legislature. Based on study findings, it was the unanimous decision of the Multnomah County Planning Commission, Board of County Commissioners, and the Metro hearing officer and elected council that West Hayden Island was needed to meet the need for marine industrial expansion. Public need has, therefore, been defined by local, regional,

and state government, and the commitment of this land for marine industrial development has been adopted as public policy. The actions proposed in the permit application are required to make the island usable for this purpose.

1.3 Supporting Information

A. Oregon Ports Study

The Oregon Ports Study was a comprehensive study undertaken for the Oregon Department of Economic Development and the Oregon LCDC to assess the expansion potential and need for land for marine industrial development in the state of Oregon. This study concentrated on the movement of commodities and was based on the supply of raw materials, the labor supply, and markets for potential products. It also considered changes in regulation and technology concerning transportation. In light of the 1980-1982 recession, the figures in the report, showing need for 610 to 650 acres of additional waterfront industrial land in the Portland Harbor, were reexamined in 1984. The results agreed with the long-term growth forecast of the study.

B. Private Sector

The needs of private waterfront industry differ significantly from those of public ports and their users. A private waterfront industry involved in manufacturing must make a substantial capital investment in plant and equipment before any operation can begin. In contrast, users of public port terminals use the waterfront as part of a transportation system which may also include barges, truck, rail, and ships; no capital investment is required.

Needs of private sector waterfront industrial activities are diverse. As part of the land use process, a study to assess the potential need for marine industrial activity on West Hayden Island was conducted (Cogan, 1982) based on historic trends in land consumption and facility expansion in the Portland harbor. This analysis was conducted in order to obtain a more complete view of total demand for waterfront land and related facilities in the harbor in the year 2000.

Private manufacturing and industrial processing activities require access to a deep-draft shipping channel, sufficient shoreline, and backup land; in addition, these activities depend upon water transportation for movement of raw materials or finished goods. For example, the Ash Grove Cement Company plant in the Rivergate area depends on water transportation to deliver limestone. Some private users of the waterfront also require additional adjacent land. These include oil storage facilities, tug and barge companies, marine construction firms, and sand and gravel companies.

The private lands on the east and west banks of the Willamette River south of the Hawthorne Bridge are being studied by both the public and private entities for redevelopment. These lands have a long history of waterfront use. If lands were available on West Hayden Island, some of these uses could potentially be relocated.

A 20-year projection of private waterfront industrial land needs was developed by PGE by examining historical land absorption by land use. The following methodology was employed:

- Based on a comprehensive list from the Port of Portland, private industrial facilities established from 1962 through 1981 were identified. Only those firms engaging in activities or handling commodities not included in the Oregon Ports Study were included.

- Each firm was contacted by telephone and asked to provide information on the type of industrial activity, size of site, past plant or site expansions, employment, date the activity was established, and future plans for expansion.

- Average annual land absorption for private industrial uses was calculated by adding the total acreage absorbed from 1962 to 1981 and dividing by 20 years.

- The historical average annual land absorption rate was used to project land needs for private waterfront industrial activities from 1981 to 2000. The historic absorption rate was used as it covers a substantial time period, during which several private waterfront parcels of various sizes were developed.

The results of the survey and analysis are found in Table 1.3-I. As indicated, from 1962 through 1981, average land absorption for private industrial uses was 13 acres per year. Several industries have expanded their plants and facilities without acquiring additional land. It is evident that private industrial firms are most attracted to sites which meet both present and future needs. This trend is expected to continue.

C. Washington Ports Study

The Port System Study for the Public Ports of Washington State, prepared in 1980 by CH_2M-Hill for the Washington Public Ports Association, concludes that despite adequate marine industrial acreage, the lower Columbia ports of Vancouver, Kalama, and Longview face a critical shortage of water frontage by the turn of the century. There is adequate waterfrontage to accommodate 17 new deep-water berths on the north side of the Columbia by the year 2000. However, the CH_2M-Hill study determined a need for a total of 24 berths on the north shore by the year 2000. This would require 6,750 linear feet of additional waterfront and approximately 195 acres of backup land to accommodate six grain terminals and a container berth. The Washington Public Ports Association concluded that if land was not available on the Columbia, this demand would locate in the Puget Sound area.

However, this excess demand on the north side of the Columbia is more likely to accrue to the south shore of the Columbia River if land is available than to Puget Sound ports because of high land-side shipping costs. Assuming two grain berths accrue in Astoria, Portland will attract the remaining four to five berths, requiring 120 to 150 acres; this is summarized in Table 1.3-II.

D. Port of Portland

In 1980, the Port of Portland initiated a planning process to formulate a 20-year master plan for developing its facilities. Based on a year 2000 cargo forecast of nearly 23 million tons (Table 1.3-III), which is a three-fold increase over 1979, a need for 28 berths is projected.

The agency currently operates 21 berths at five marine terminals. Without rehabilitation, seven berths are expected to become obsolete in the near future. Although the master plan recommends rehabilitation of these aging berths and more intense utilization of other existing facilities, as many as 10 additional berths may be required. The number, type, and physical characteristics are presented in Table 1.3-IV. For public terminals only, the Port of Portland expects to require 270 to 350 acres with 7,000 to 9,250 lineal feet of water frontage to accommodate new berths.

Table 1.3-I

HISTORICAL LAND ABSORPTION FOR PRIVATE INDUSTRIAL ACTIVITIES
IN PORTLAND HARBOR, 1962-1981

Firm	Year Developed	Site Size (acres)
Ash Grove	1963	30
Collier Chemical	1968	12
Crowley Maritime	1975	10
Fred Devine Salvage	1975	10
General Construction Company	1962	16
Knappton Towboat	1979	5
Martin Marietta	1981	3.5
Oregon Steel	1969	125
Palmco	1973	18.5
Waterways Terminal	1970	30
TOTAL		260
Average Absorption per Year 1962-81		13 acres/year
PROJECTED LAND DEMAND IN YEAR 2000* (20 years @ 13 acres/year)		260

* Assuming historical rate will continue from 1981 to 2000.

Table 1.3-II

PROJECTED EXCESS DEMAND FROM WASHINGTON PORTS
TO LOWER COLUMBIA RIVER PORTS IN OREGON

	Acres		
Berths	Total	To Astoria	To Portland
6 Grain @ 30 acres*	180	60	120
1 Container @ 30 acres*	30	—	30
TOTAL	210	60	150

* Assumed land required per berth based on Oregon Ports Study.

Source: The Port System Study for the Public Ports of Washington State and Cogan & Associates, 1982.

Table 1.3-III

CARGO PROJECTIONS FOR PORT OF PORTLAND FACILITIES

Type	1979	Short-Tons Projected - 2000 Mid-Range	High-Range
General			
Container	687,400	2,000,000	2,800,000
Breakbulk/ Plywood	324,900	350,000	455,000
Lumber	211,000	255,000	430,000
Container on Combination Ships	162,000	400,000	500,000
Subtotal	1,385,300	3,005,000	4,185,000
Bulk and Neobulks			
Grain	3,584,600	6,450,000	7,500,000
Steel	437,300	750,000	1,500,000
Feed Grain	-	324,000	1,600,000
Dry Bulk	436,200	475,000	650,000
Logs	295,400	350,000	500,000
Autos	279,600	340,000	600,000
Liquid Bulk	46,900	75,000	240,000
Coal	-	-	6,000,000
Subtotal	5,080,000	8,764,000	18,590,000
TOTAL	6,465,300	11,769,000	22,775,000

Source: Marine Terminals Master Plan, Port of Portland, 1980.

Table 1.3-IV

PROJECTED REQUIREMENT FOR NEW PUBLIC DEEP-DRAFT PORT FACILITIES IN THE PORTLAND REGION - YEAR 2000

Berths	Facility Type	Lineal Feet of Waterfront/ Berth	Acreage/ Berth*	Lineal Feet of Waterfront	Total Acreage
1	Coal	1,000	110**	1,000	110
2	Dry Bulks 1-Export 1-Import	750-1,000		1,500-2,000	
2	Grains	750	10-30***	1,500	20-60
1	Automobile	750	80-100	750	80-100
3- 4	Containers	750-1,000	20	2,250-4,000	60-80
9-10				7,000-9,250	270-350

* Derived from data about existing facilities and consideration of future innovations.

** Minimum acreage to accommodate loop railroad track. Port plans to build all three berths on proposed coal export facility site south of Terminal 5.

*** Depends on whether facility is barge- or rail-intensive; latter requires additional land for loop track.

Source: Marine Terminals Master Plan, Port of Portland, 1980.

E. Other Needs

In addition to the 1,000 acres projected in the land use process, there is a potential need for an additional 385 acres that was not included in that study to keep the marine transportation system healthy. Table 1.3-V shows three factors which could generate additional land requirements for waterfront industrial development.

Table 1.3-V

ADDITIONAL WATERFRONT INDUSTRIAL LAND NEED FACTORS IN PORTLAND HARBOR, 1981-2000

Factor	Acres
Special Locational Requirements of Specific Users/Developers*	250
Possible Future Relocation of Heavy Industries in Willamette River Greenway South of Downtown Portland	75
Additional Storage Sites for Gravel Industry	60
TOTAL	385

* Calculated as 25 percent of the total land demand projection of 1,000 acres.

Of the three factors presented in the table, the need to provide locational flexibility for specific users is the most critical to the region's economy. Every waterfront industrial development varies significantly in its land and operating requirements. While barge companies need only a narrow strip of waterfront land for moorings, other users, such as the partially completed coal terminal at Rivergate, require large parcels of land (in this case more than 100 acres) to provide for storage and rail facilities.

Development patterns for waterfront industrial uses vary considerably from those for residential, commercial, and light industrial land. Generally the former is not absorbed at a constant annual rate but rather in large blocks, often several years apart. The current inventory of waterfront industrial land in Portland is constrained by various factors, such as inconvenient and in some cases noncompetitive rail services on the west side of the Willamette River. It is probable that an industrial user in need of a 100-acre site could not find a suitable site in Portland today, even though Table 1.3-VI indicates that approximately 315 acres of land are available. Of this supply, over 100 acres are committed to development for a coal terminal in Rivergate.

F. Inventory of Vacant Land

Most water-dependent industrial activities in the Portland region require: (1) location on the Willamette or Columbia rivers with access to the 40-foot channel or, in the case of barge activity, to the 20-foot channel in the Oregon Slough; (2) service by the three available inland transportation modes (barge, rail, and truck); (3) sufficient water frontage to accommodate oceangoing ships or barges; and (4) appropriate adjacent acreage for on-land facilities for loading/unloading, storage, processing, and other activities.

A complete inventory of all vacant waterfront industrial land (excluding West Hayden Island) with access to the 40-foot channel within the regional UGB is presented in Table 1.3-VI. While a potential 686 acres in the Portland harbor are vacant, 270 acres of Port of Portland land are not suitable for deep-draft marine development. Lack of access to the 40-foot channel, insufficient backup land, or commitment to other uses are factors making these areas unsuitable. A 90-acre site on the Willamette River in St. Johns was eliminated from the inventory of suitable sites because of poor truck access, restrictive zoning, and the possible adverse effects of heavy industrial development on the community. Of the remaining private vacant land, only 115 acres are suitable for deep-draft marine terminals.

Table 1.3-VI

VACANT WATERFRONT INDUSTRIAL LAND IN PORTLAND HARBOR - 1982

Parcel	Total	Constrained or Not Available	Net Available	Comments
Publicly Owned				
Port of Portland	470	270	200	270 acres not suitable due to narrow size, lack of water access, or previous commitment.
City of Portland - St. Johns Waterfront	90	90	-	Only 40 acres suitable for water-oriented development. Truck access too steep; adverse impact on residential neighborhood. M-2 zoning restricts heavy industrial development.
Privately Owned				
Harborton - Portland General Electric	40	-	40	Subject to siltation; requires maintenance dredging. Not well suited for heavy rail access.
First Pennsylvania Site - First Pennsylvania; ESCO; Chipman	40	-	40	Subject to siltation; requires maintenance dredging. Not well suited for heavy rail access.
Zidell Site - north	35	-	35	
Zidell Site - south	11	11	-	Two extremely narrow parcels.
Subtotal	126	11	115	
Total	686	371	315	

G. Staged Development

The absorption of land for marine industrial development is cyclical and varies considerably from year to year. This project is anticipated to be absorbed in 10 years and assumes an annual rate of development comparable to the last 25 years. The rate has dropped over the last few years and, if it continues at the lower rate, the project completion could extend to 15 to 20 years. The filling of the land will occur in phases and will be programmed to have a two- to three-year supply of available land. If market rates are low, the filling schedule will be adjusted accordingly.

H. Summary of Need

Table 1.3-VII summarizes the need for marine industrial land identified in the land use process. The figures are based on data from the Oregon Ports Study, historical land absorption for private industrial activities in the Portland harbor, and The Port System Study for the Public Ports of Washington State. The West Hayden Island site would provide land to meet 30 to 50 percent of the need, depending on the development alternative that is chosen.

Table 1.3-VII

PROJECTED TOTAL DEMAND FOR ADDITIONAL WATERFRONT INDUSTRIAL LAND IN PORTLAND HARBOR - YEAR 2000

Activity	Land Demand (Acres)
Public and private facilities for major commodities	610-650
Private waterfront industries	260
Facilities to meet excess demand from Washington ports	150
TOTAL	1,020-1,060

Source: Cogan & Associates, 1982.

2.0 Alternatives

2.0 ALTERNATIVES

2.1 General Description of the Proposed Action

2.1.1 Location and Existing Use

Hayden Island is located in the Columbia River, upstream of the confluence of the Willamette River, and between the cities of Portland, Oregon, and Vancouver, Washington. It is separated from Portland by the Oregon Slough and from Vancouver by the main channel of the Columbia River (Figure 2.1-I).

PGE owns 496 acres of the undeveloped western end of the island. The other major landowners are: Western Transportation Company (a subsidiary of Crown Zellerbach Corporation), 182 acres; Hayden Island, Inc., 37 acres; and Burlington Northern Railroad, 33 acres. The Bonneville Power Administration (BPA) owns a 200-foot-wide transmission line corridor across the island (13 acres). Pacific Power & Light Company holds a transmission line easement across PGE's property.

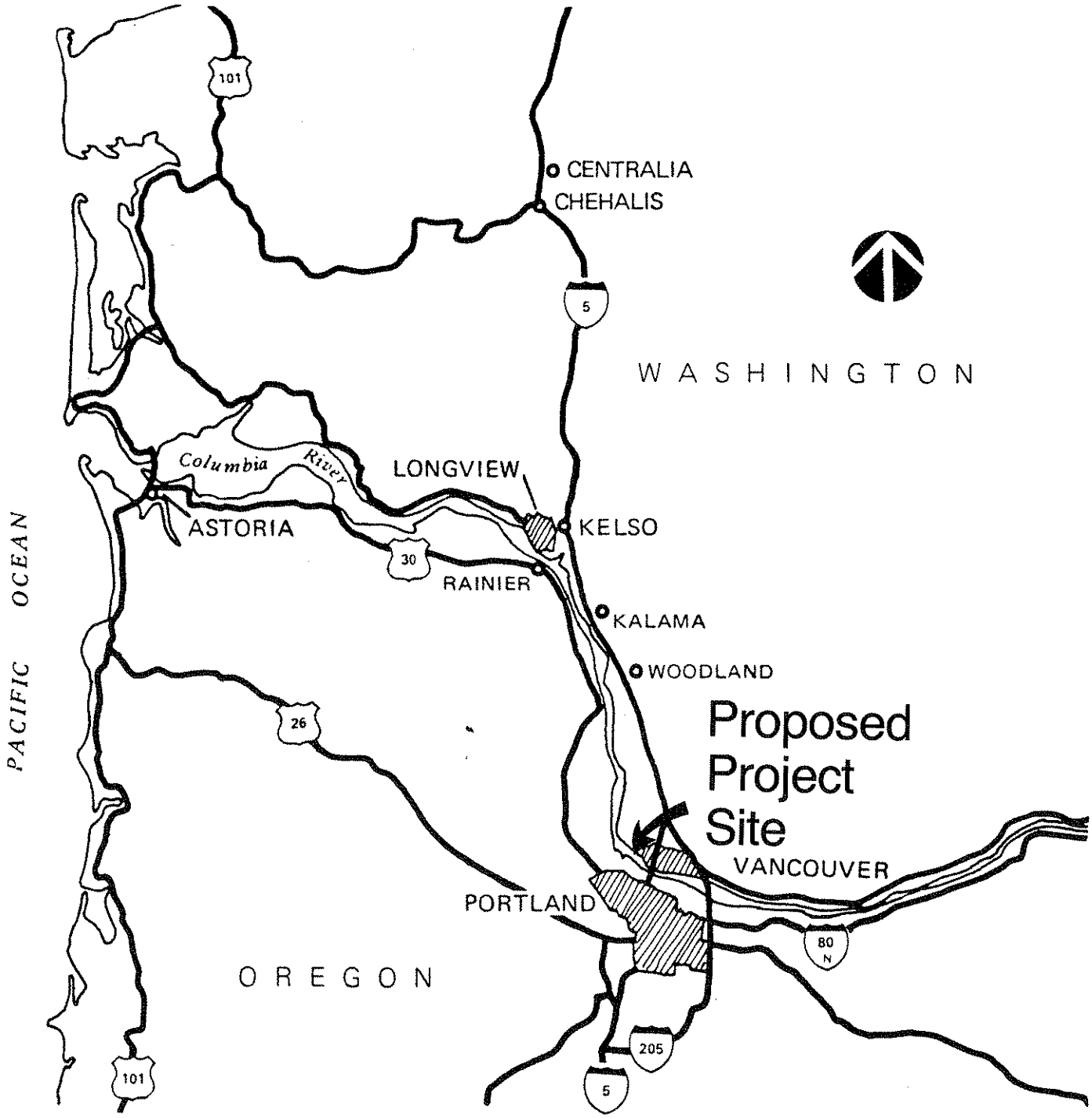
The Interstate 5 (I-5) freeway crosses Hayden Island, providing automobile access to the residential, recreational, and commercial development on the eastern end of the island. A main line of the Burlington Northern Railroad also crosses the island. The Portland area is served by the Southern Pacific, Union Pacific, and Burlington Northern railroads.

The land is currently leased to Portland Livestock Company and used for grazing sheep, cattle, and horses. The site serves as a holding area and feed lot for livestock being shipped through the Portland Stock Yards.

2.1.2 Proposed Action

PGE has applied to the Portland District U.S. Army Corps of Engineers (Corps) for a permit under Section 10 of the River and Harbor Act of 1899 and Section 404 of the Clean Water Act. This permit is required for the dredging of material from the Columbia River and Oregon Slough and the placement of fill material in up to 76.5 acres of wetlands for the purpose of preparing the site for marine industrial development. The proposed development plans for dredging and fill placement are shown on Figures 2.1-II and 2.1-III. The proposed action would consist of the following:

A. Dredge a 300-foot-wide by 5,600-foot-long access channel with a 500-foot by 2,000-foot turning basin on the north side of Hayden Island. Figure 2.1-II shows specific geographic coordinates to indicate the location of the proposed access channel and the turning basin. Dredging would be accomplished by hydraulic and/or clamshell dredge to a depth of -45 feet CRD. The dredged material, approximately 2 mcy, would be utilized for site development on the island.



Regional Location Map

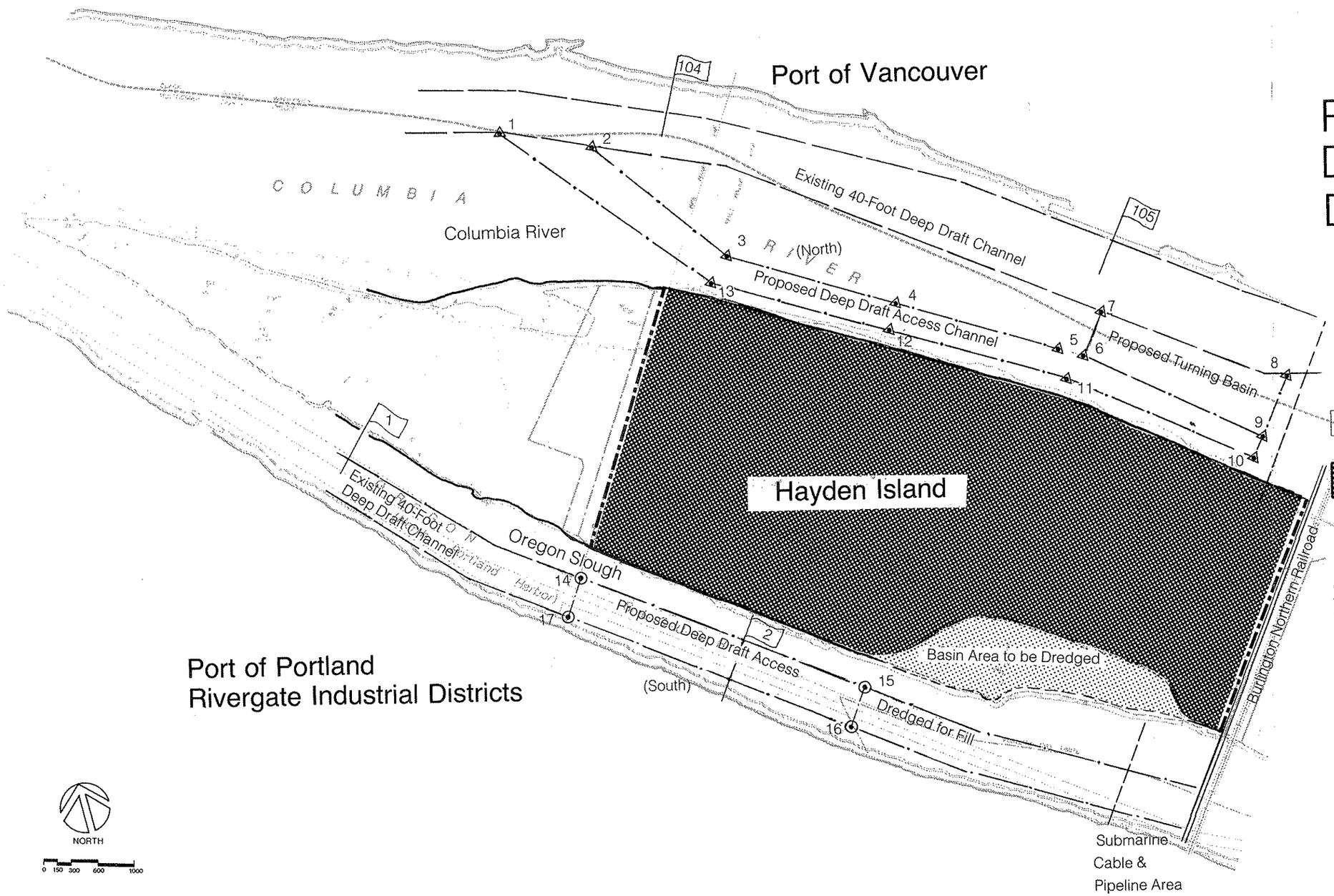
PSD006294

Figure 2.1 - I

Portland General Electric

HAYDEN ISLAND

Proposed Development Dredging Plan



LEGEND

Area to be Filled

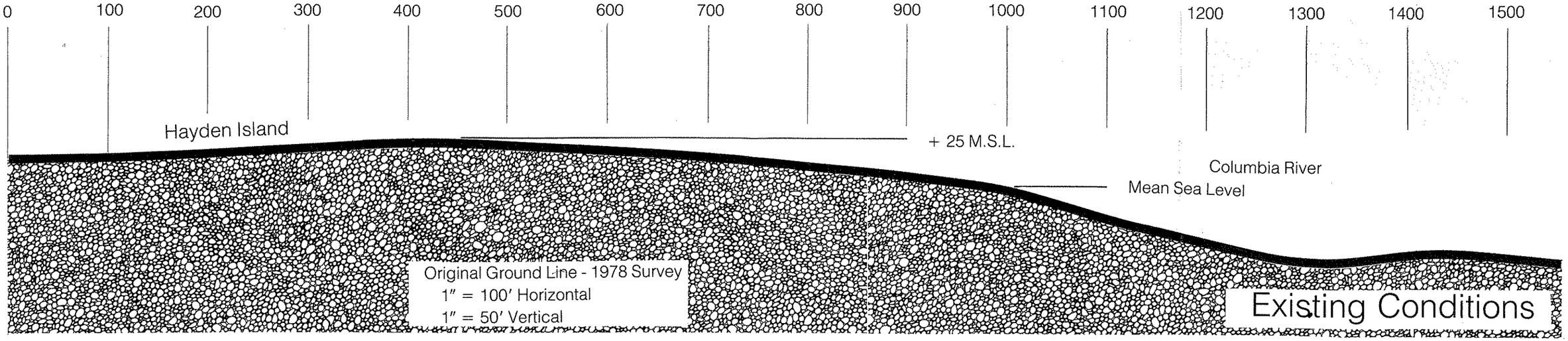
Dredging Coordinates

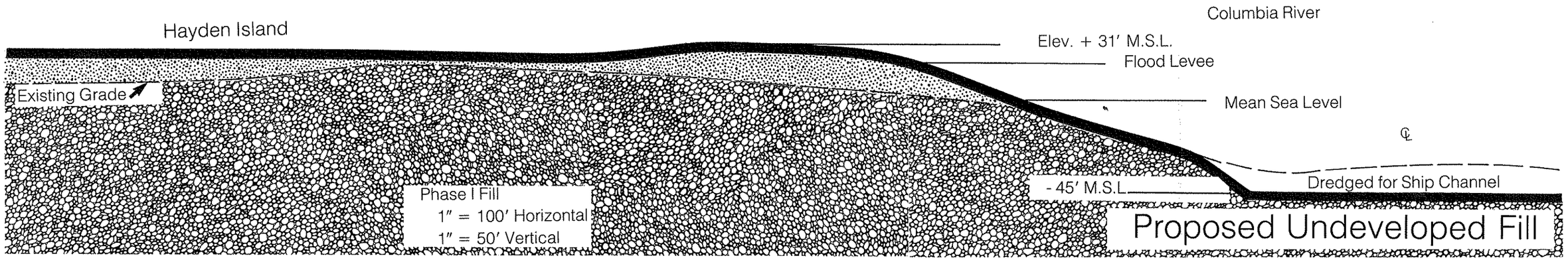
Pt.	W. Longitude	N. Latitude
(North Ch. & T.B.)		
1	122° 43′ 20.5″	45° 38′ 27.0″
2	122° 43′ 07.3″	45° 38′ 23.3″
3	122° 42′ 49.8″	45° 38′ 06.6″
4	122° 42′ 24.4″	45° 37′ 56.5″
5	122° 42′ 00.3″	45° 37′ 46.2″
6	122° 41′ 57.1″	45° 37′ 44.2″
7	122° 41′ 53.0″	45° 37′ 47.9″
8	122° 41′ 33.8″	45° 37′ 37.7″
9	122° 41′ 39.2″	45° 37′ 33.3″
10	122° 41′ 41.7″	45° 37′ 31.1″
11	122° 42′ 02.5″	45° 37′ 43.4″
12	122° 42′ 26.2″	45° 37′ 53.8″
13	122° 42′ 52.1″	45° 38′ 04.1″
(South Ch.)		
14	122° 43′ 28.0″	45° 37′ 36.0″
15	122° 42′ 52.3″	45° 37′ 17.9″
16	122° 42′ 55.6″	45° 37′ 14.6″
17	122° 43′ 31.4″	45° 37′ 32.9″

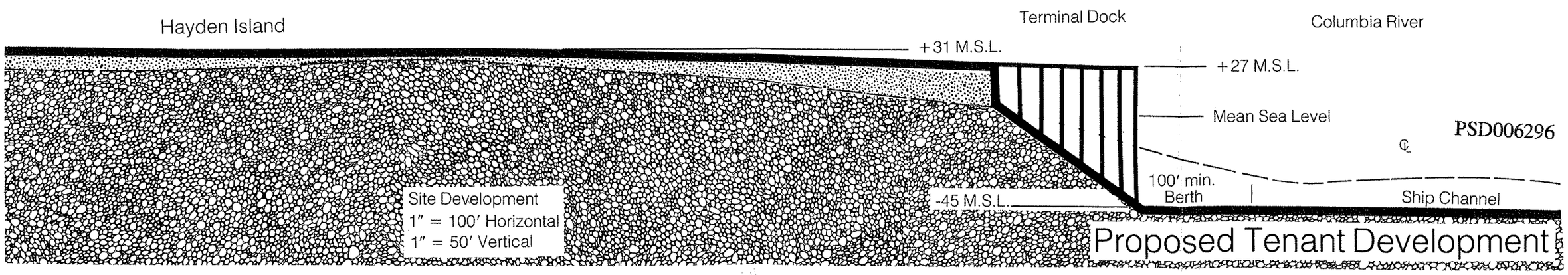
Benkendorf Associates
Ogden Beeman & Associates

Figure 2.1 - II
II - 3

PSD006295







Preliminary Site Development

Figure 2.1 - III

B. Excavate, from the Oregon Slough, approximately 64 acres from the island in order to obtain 6.5 mcy of fill for site development. The excavation would be accomplished behind a shoreline berm to a maximum depth of -45 feet CRD. Once the project depth is achieved, the berm would be removed and the Oregon Slough would be dredged to the basin's maximum depth. Approximately 35.5 acres of shallow water habitat adjacent to the basin and approximately 3.1 acres of shallow water habitat within the Federal Navigation Channel would be eliminated by this dredging. Dredged materials will be discharged on Hayden Island behind berms to provide for settling of fine materials before return waters are discharged to the river.

C. Place approximately 8.5 mcy of fill from the above-mentioned actions on the island, thereby filling approximately 76.5 acres of wetland. The fill would be placed along the bankline above and shoreward of +10 feet NGVD elevation, sloped back on a 3:1 slope to an elevation of +31 feet NGVD. The fill would then be sloped toward the interior of the island at a 2 percent grade to an elevation of +24 feet NGVD. Approximately 4.1 acres would be filled between +10 feet NGVD and the ordinary highwater line (+17.3 feet NGVD).

D. An estimated 50,000 cy of sediment material per year would accumulate in the access channel and turning basin in the Columbia River. The frequency of maintenance dredging would depend on the sediment distribution. It is estimated that maintenance dredging of up to 10,000 cy would be required every 10 years to maintain adequate depth in the Oregon Slough channel and basin. All the dredged materials are expected to be clean sand and probably would be sold, used as fill on-site, or disposed of in-water downstream.

There are 79.5 acres of wetlands on the PGE property. The implementation of the proposed development would result in the filling of nearly all of these wetlands, depending on the development alternative.

The site is proposed to be filled over a 10- to 15-year period in 75- to 100-acre segments, with flood control levees constructed sequentially to assure flood protection for the interior of each segment. The first phase would include the dredging of the access channel and turning basin. The second development phase would include the excavation of the basin on the island. If the Bonneville Navigation Lock material would be available, then basin excavation requirements may be reduced or delayed until additional fill is required (eg, Phase III). Mitigation for the wetlands to be filled would be coordinated with the phasing of the filling and development. The land would be marketed to industrial users who would construct on-site facilities, including waterfront structures such as bulkheads, pile-supported wharfs, dolphins, or finger piers. Individual site developers would be responsible for obtaining all required local, state, and federal permits for additional dredging, filling, and construction.

Automobile and truck access to the western portion of Hayden Island would be provided by constructing a bridge across the Oregon Slough, connecting with North Marine Drive. This is a requirement of the Multnomah County Comprehensive Plan. Planning for the bridge is being coordinated with the City of Portland and the Federal Highway Administration, who are developing plans for the relocation of this portion of Marine Drive. Construction of the bridge would require a permit from the U.S. Coast Guard under the authority of Section 9 of the River and Harbor Act of 1899. This permit will be requested by the owner at a later date and will be evaluated by the U.S. Coast Guard. An EIS Supplement or Environmental Assessment will be prepared for the evaluation. If the project is absorbed over a longer time frame, the existing transportation system has the capacity to accommodate the first several developments. The bridge could be constructed at a later phase of development.

A primary issue for design of this bridge is the clearance above ordinary high water. The Interstate 5 Bridge over the Oregon Slough, to the east of the new bridge site, is a low-level bridge; access for users between that bridge and the proposed bridge would be limited by the Interstate 5 Bridge clearance. PGE will hold public meetings to evaluate needs for access and clearance.

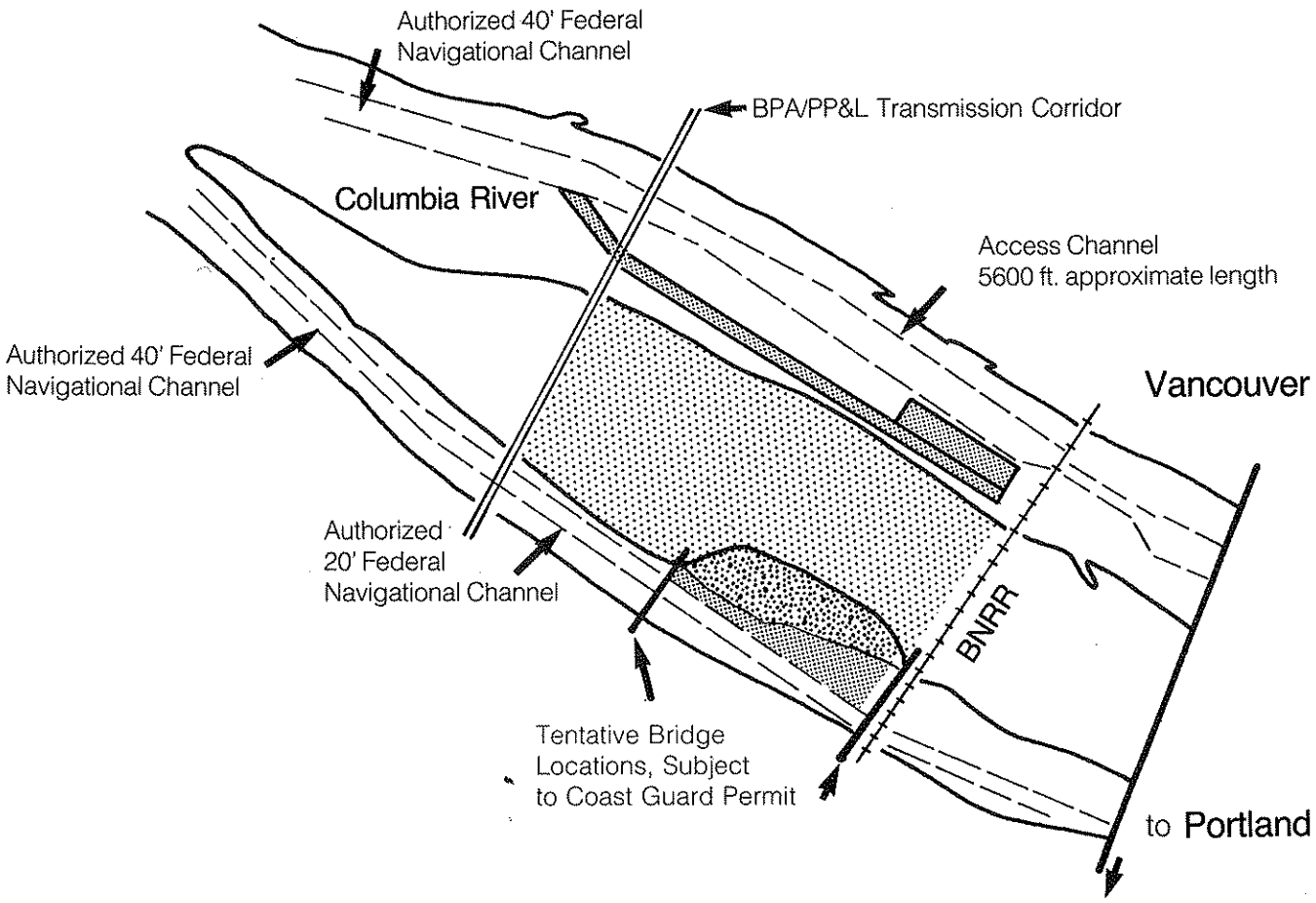
The permit application plans are illustrated in Figures 2.1-IV and 2.1-V.

2.1.3 Potential Uses for the Proposed Development

West Hayden Island has been identified in the Multnomah County Comprehensive Plan as an extension of the development of the Rivergate Industrial District and, as such, will attract similar users. Because the development is likely to occur over a 10- to 20-year period, it is not possible to designate specific users or specific parcels at this time. The comprehensive plan limits the use of the island to marine industrial development and supporting uses.

Marine industrial development includes all uses which require access to the shipping channels of the Columbia and Willamette rivers, including but not limited to: private industries receiving and processing raw materials or shipping products, shipbuilding and repair firms, marine construction, private and public shipping terminals, tug and barge operations, and related uses. The types of vessels using these facilities may include tugs, river barges, ocean barges, and oceangoing ships.

Because of the nature of marine development, all waterfront users will include access to the water. The precise facilities and their location will be determined as specific users prepare their plans. This permit, therefore, will leave the area between +10 feet NGVD and -20 feet CRD along the shoreline as it currently exists. Permits to work in this area will be obtained by the specific users. The waterfront structures will generally fall within one of the five basic categories.



LEGEND

- Dredge Site
- Area of Fill
- Basin

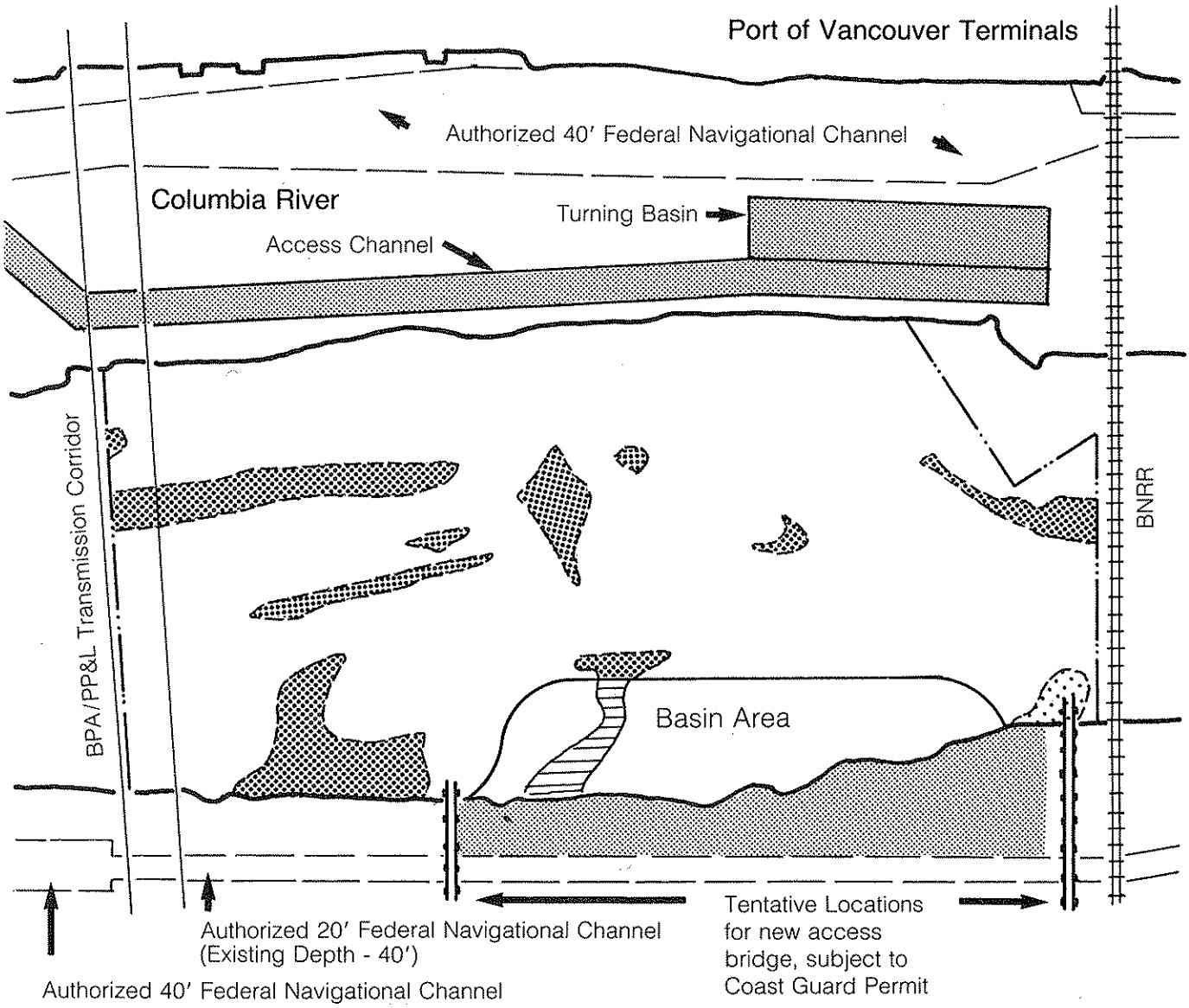
North

1500 0 3000

Scale: 1" = 3000'

Permit Application Plan — Overview

Figure 2.1 - IV



LEGEND

- Property Line
- Existing Wetlands to remain (approx. 3 acres)
- Existing Wetlands to be filled (approx. 77 acres)
- Wetland to be Excavated

North

500 0 1000

Scale in Feet

Permit Application Plan — PGE Property

Figure 2.1 - V

A. Dolphins

In some cases the facilities will simply provide a minimal structure to tie up ships or barges. Access to the shoreline would be minimal. The dolphin would consist of 10 to 15 pilings clustered and fastened together.

B. Pile-Supported Finger Piers and Conveyor Systems

In cases where loading is done by pipelines or conveyors or from one or two standard points on a ship, waterfront facilities will consist of a "T-", "U-", or "L-shaped" pier supported by piling. Autos, grain, and dry bulks would likely use these types of facilities.

C. Pile-Supported Wharf

In cases where ships are unloaded from the entire length and/or the cargo is lifted from the ship directly to the shore, a more substantial structure is needed. This structure often must support both rail and truck as well as the loading and unloading of cargo. In some cases where loadings are light and the wharf is not extensive, a pile-supported structure can be used.

D. Bulkheads

In cases where the wharfs are large and the loadings and activities extensive and heavy, a bulkhead structure would probably be used. This would be a vertical sheet pile, edge to -40 feet CRD, which would be backfilled with dirt. This would allow maximum flexibility for cargo handling. This structure would most likely be used for containers, steel, and other similar operations.

E. Shipways

In cases where the land is used to build ships or barges, shipways would be constructed. These would be sloped tracks to slide the newly constructed vessels into the water.

Table 2.1-VI summarizes the types of users and the facilities they might require. Designs and specifications will be developed and submitted for approval to appropriate agencies as future tenants prepare to develop their sites.

Table 2.1-VI

SUMMARY OF POTENTIAL USES AND REQUIRED FACILITIES

Use Category	Facilities		Traffic			Commodities		Fuel
	Waterfront	Backup	Rail	Truck	Auto	Source	Destination	Storage
Private Industry	Variable, Pile Supported	Variable, Depending on Process	Variable	Variable		Variable	Variable	Variable
Shipbuilding and Repair	Shipways and Pile-Supported Structures	Limited	Low	Low		Local	Variable	Limited
Marine Construction	Pile-Supported Structures	Medium	Low	Low		Variable	Mostly Alaska	Variable
Marine Terminals								
Bulk	Pile-Supported Structures	Depends Upon Need for Unit Trains	Heavy	Moderate		Midwest	Pacific Rim	Limited
Automobiles	Pile-Supported Structures and Barges	Large	Heavy	Heavy		Japan	Midwestern United States	Limited
Lumber	Pile-Supported Structures and Barge to Ship	Medium	Variable	Variable		Northwest Region	Pacific Rim	Limited
Steel	Bulkhead	Large	Heavy	Heavy		Pacific Rim	Northwest Region	Limited
General Cargo	Bulkhead	Large	Heavy	Heavy		Variable	Variable	Limited
Tug and Barge Facilities	Pile-Supported Structures	Small to Medium	Variable	Variable		Upper Columbia and Willamette Rivers	Variable	Limited
Supporting Uses	None	Variable, Small to Medium	Variable	Variable		Variable	Variable	No

2.2 Alternative Development Plans

2.2.1 Alternative Development Plans

During the course of the land use and fill permit approval process, a number of alternatives have been examined. The proposed action on the requested permit, as described in Section 2.1, is one alternative. The land use process examined alternative locations and determined that there were no alternative sites. Those findings are summarized in Section 2.3. There are two potential uses allowed under existing zoning which would not require dredge and fill permits. These uses are discussed in Section 2.4 and the no action section.

Six alternative development plans were examined, including the proposal on the requested permit. Three of these are carried forward into the FEIS. Alternative A is the proposed development plan and the applicant's preferred alternative. A comparison of the three development alternatives is provided in Table 2.2-I.

2.2.2 Development Plans

A. Alternative A - Basin Plan (Applicant's Preferred Alternative)

Concept

The basic concept of Alternative A is to provide the maximum waterfront development with the flexibility to respond to a wide variety of marine users (Figure 2.2-II). This would balance the need for land to match the availability of fill material. In this case, 6.5 mcy of fill material would be excavated from the island itself to provide the needed material.

Mitigation

Wildlife habitat mitigation would occur off-site.

Development

There would be four different types of sites: large and medium waterfront sites, small barge-oriented sites, and small interior warehouse and supporting industrial sites. This plan includes the flexibility to combine these sites into a variety of configurations.

Services

Sewer, water, electric, telephone, roads, and rail access would be concentrated in a service corridor in the center of the island to provide the maximum service at the minimum cost. The bridge to the mainland would be either upstream

or downstream from the basin. This decision will depend on the alignment chosen for the relocation of Marine Drive.

B. Alternative B - Modified Basin Plan

Concept

In concept, this plan is a variation of Alternative A. The difference is that 132.3 acres of land around the basin would be left in a natural state (Figure 2.2-III). This would also eliminate about 4,820 feet of waterfront for marine uses. The primary source of fill material would still be the basin. Because of a reduced need for fill, the basin could be reduced slightly in area and/or in depth.

Mitigation

Mitigation in this plan would occur on-site. The shoreline around the basin and the undeveloped acreage between the basin and the road would be enhanced for wildlife use.

Development

This alternative has the same number of large and medium waterfront sites. All of the smaller barge and most of the supporting industrial sites have been eliminated. Most of the flexibility associated with those sites has also been eliminated.

Services

Services would be concentrated in the same corridor as Alternative A. The cost of services per acre would be higher due to the reduced development area. As in Alternative A, there would be flexibility in the location of the bridge.

C. Alternative C - North Shore Plan

Concept

Development would occur only on the north shore and only provide large marine sites (Figure 2.2-IV). There are only small variations in site sizes and approximately 50 percent of the waterfront is not developed. There is no identified source for 4.5 mcy of material.

Mitigation

This plan would leave 194 acres of land undeveloped, including about 7,350 lineal feet of shoreline. This area would be enhanced for wildlife use to replace the wetland values lost in the development of the north shore.

Development

Alternative C provides only six large waterfront sites. There are no medium sites, no small barge sites, and no land for supporting uses.

Services

This alternative, similar to Alternatives A and B, has a single-spine corridor for services. The bridge, however, would be located on the east end of the island, downstream from the railroad bridge, to avoid the natural area.

Table 2.2-I

COMPARISON OF
WEST HAYDEN ISLAND DEVELOPMENT ALTERNATIVES

SUMMARY

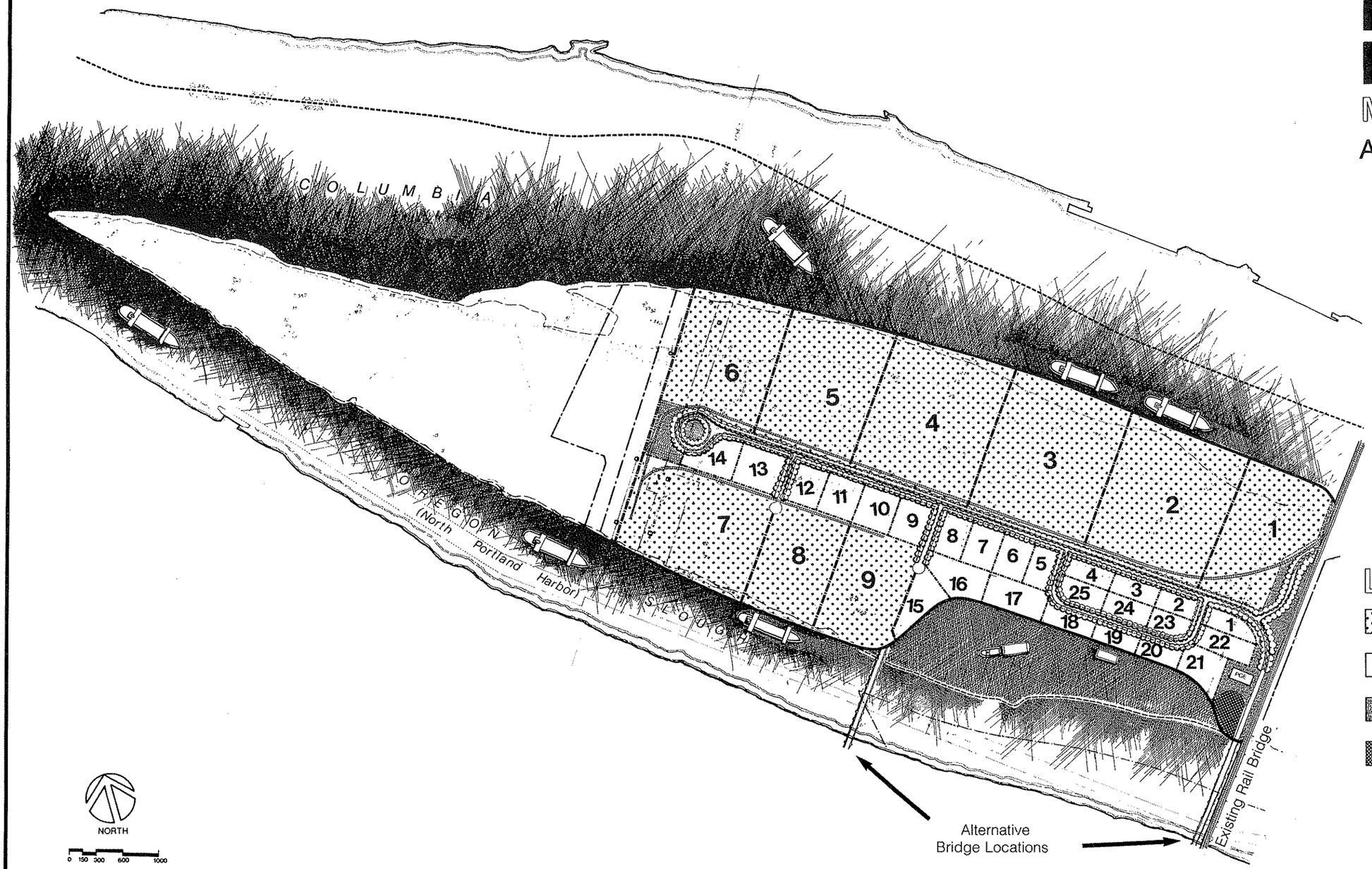
	Alternative A	Alternative B	Alternative C
Acres of Developable Land	451.4	351.4	329.7
Marine	357.4	332.4	329.7
Supporting	94.0	19.0	0.0
Wetlands Filled	76.5	66.6	46.5
Acres of Land for Basin	64.4	40.0	0.0
Shallow Water Habitat Loss	38.6	38.6	0.0
Acres of Land Not Developed	7.9	132.3	194.0
Wetlands	3.0	12.9	33.0
Linear Feet of Services			
Road	14,490.0	10,950.0	9,000.0
Rail	15,000.0	14,550.0	15,480.0
Sewer	8,280.0	8,280.0	7,920.0
Water	8,280.0	8,280.0	7,920.0
Total Fill Required (mcy)	8.3	6.0	6.5
Total Fill Available (mcy)			
River	2.0	2.0	2.0
Basin	6.5	4.0	0.0

Portland General Electric

HAYDEN ISLAND

MASTER PLAN

ALTERNATIVE A



NORTH

0 150 300 600 1000

ALTERNATIVE A

LEGEND

- **Marine Terminal Berths** 9 Sites - 357 acres
- **Industrial Warehouse Sites** 25 Sites - 94 acres
- **Undeveloped Land** 4.6 acres
- **Preserved Wetlands** 3.3 acres

Benkendorf Associates
Ogden Beeman & Associates

Figure 2.2 - II
II - 14

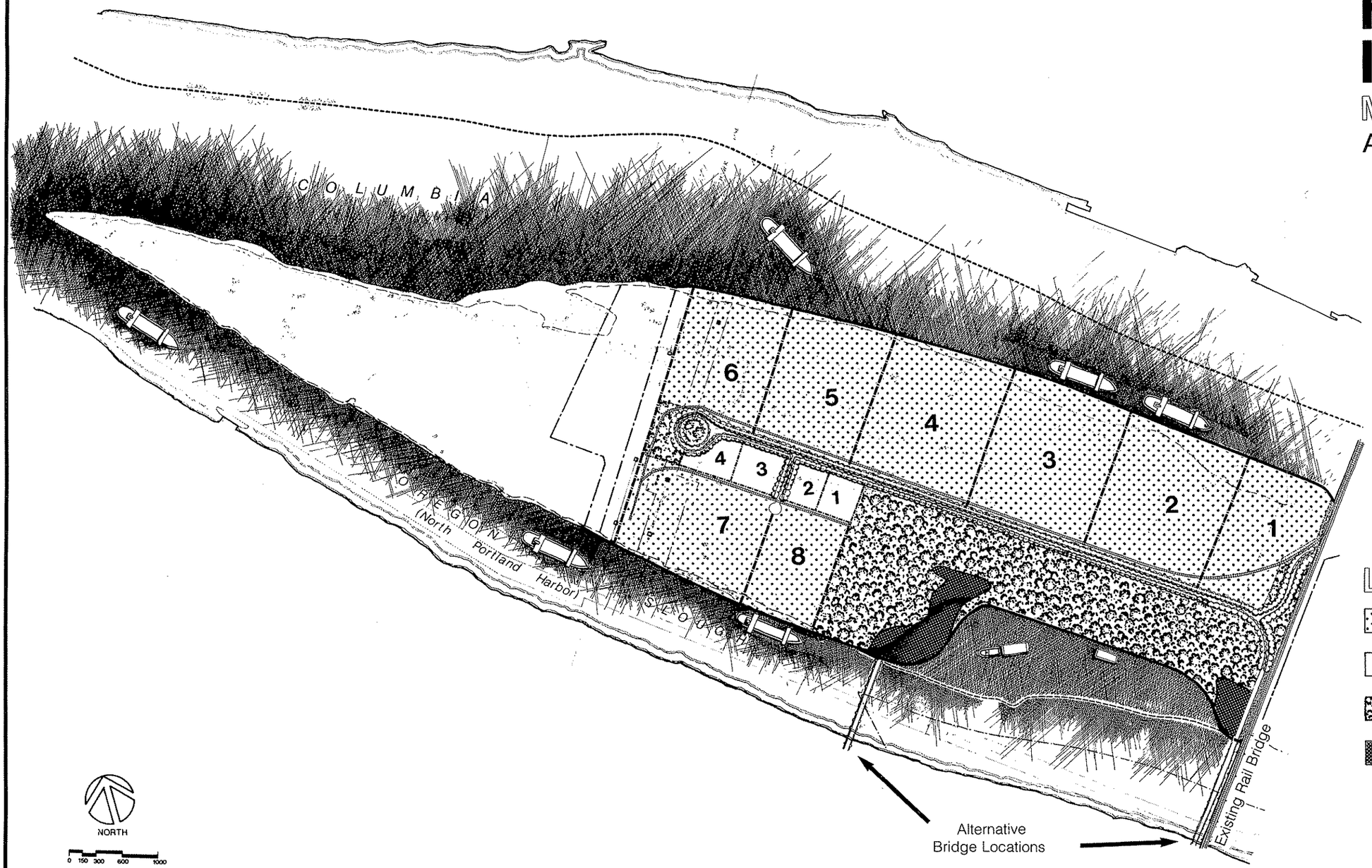
PSD006306

Portland General Electric

HAYDEN ISLAND

MASTER PLAN

ALTERNATIVE B



NORTH

0 150 300 600 1000

LEGEND

- **Marine Terminal Berths** 8 Sites - 332 acres
- **Industrial Warehouse Sites** 4 Sites - 19 acres
- **Undeveloped Land** 132 acres
- **Preserved Wetlands** 13 acres

ALTERNATIVE B

Benkendorf Associates
Ogden Beeman & Associates

Figure 2.2 - III
II - 15

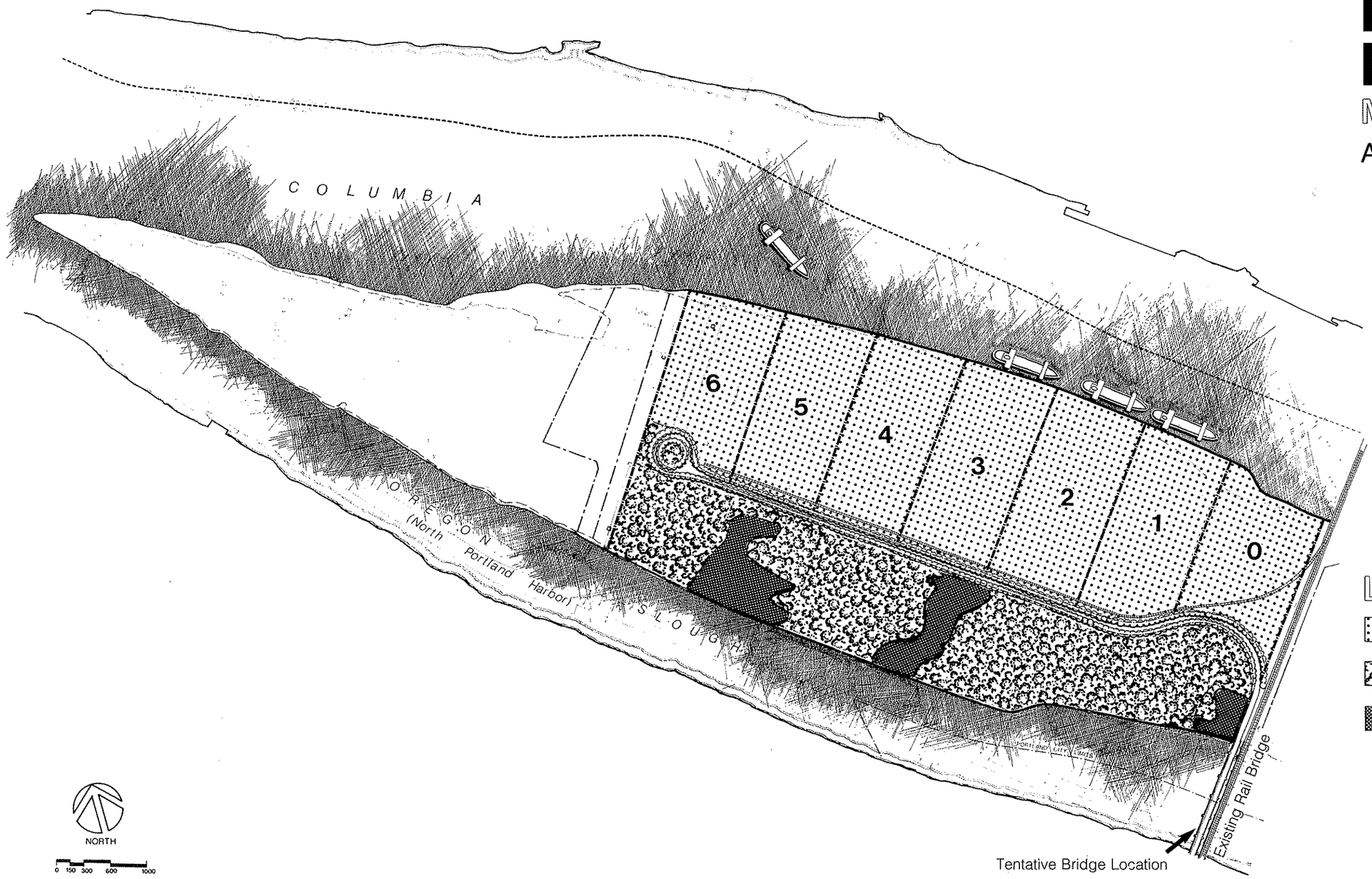
PSD006307

Portland General Electric

HAYDEN ISLAND

MASTER PLAN

ALTERNATIVE C



LEGEND

- **Marine Terminal Berths** 7 Sites - 330 acres
- **Undeveloped Land** 194 acres
- **Preserved Wetlands** 34 acres

NORTH

0 150 300 600 1000

ALTERNATIVE C

Benkendorf Associates
Ogden Beeman & Associates

Figure 2.2 - IV
II - 16

PSD006308

2.2.3 Alternatives Not Carried Forward in the FEIS

Total Development Plan

In the Draft Environmental Impact Statement (DEIS), an alternative was proposed to fill the entire island to an elevation of +31 feet NGVD. A rail and road were looped around the island. Twenty-five (plus or minus) acre sites were located around the periphery and smaller 4- to 6-acre sites were located inside the loop road. This was based on a concept of combining on-site rail with the main rail line to accommodate unit trains.

This plan required 13 mcy of fill with a known source of only 2.5 mcy. This plan does not provide the option for any waterfront sites over 25 acres. The loop rail and road would also have very high service costs per acre.

Plan Evaluation

A. Requires 13+ mcy of fill material with an identified supply of only 2.5 mcy.

B. There are no waterfront sites over 25 acres and no flexibility in site size.

C. Because of the loop rail and road, the cost of services per acre is very high.

D. This plan does not have the capability to accommodate unit trains on any site.

E. There is no opportunity for on-site mitigation.

Open Center Plan

The DEIS contained a plan to develop the periphery of the site similar to the total development plan but to leave the area inside the road undeveloped. This reduces the amount of fill material required from 13 mcy to 6.7 mcy. However, there is still a shortage of over 4.2 mcy. This plan would provide an area for on-site mitigation; however, the area is isolated from the river and would be surrounded by heavy development. The lack of ability to accommodate unit trains on-site is also a major drawback of this plan.

Plan Evaluation

A. Requires 6.7 mcy of fill material with a supply of only 2.5 mcy.

B. There are no waterfront sites over 25 acres and no flexibility to provide large sites.

C. There is no ability to provide unit train capacity on-site.

D. Because of the loop rail and road and the large amount of undeveloped land, this plan has the highest cost of services per acre.

E. Potential wildlife areas are isolated from the river and completely surrounded by development.

Preserve Existing Wetlands

The wetlands on West Hayden Island range from less than one acre to slightly over 20 acres and are scattered around the island. The existing wetlands are also generally seasonal and of poor habitat value (see Section 4.2.3). A 10- to 20-acre wetland in the middle of a container terminal would have little value for wildlife and would create an extremely inefficient marine operation. This plan would provide the least desirable option for both environmental and developmental interests.

2.3 Alternative Locations for the Proposed Development

2.3.1 Characteristics of Appropriate Sites

To be usable as an interchange facility between the landside transportation system and the oceanside system, land must be adjacent to the 40-foot Columbia and lower Willamette River navigation channel (which extends upstream in the Columbia River to the Interstate 5 Bridge and in the Willamette River to the Broadway Bridge), be served by rail, have access to the interstate freeway system, and have a minimum of 40 acres of backup land per berth. Proximity to other shipping and warehousing facilities increases the efficiency of handling many cargoes. A project large enough to aggregate harbor facilities in a single area is most desirable. Local zoning and comprehensive plans must accommodate this type of development. Potential sites considered as alternative locations for the proposed development are shown on Figure 2.3-I.

2.3.2 Sites Within the Portland Harbor

Remaining uncommitted sites which are within the regional UGB on the 40-foot channel and served by rail total 315 acres. Approximately 200 acres are owned by the Port of Portland and 115 acres are in private ownership.

Of the land owned by the Port of Portland, 110 acres are currently committed to the coal terminal (under construction) and a 60-acre parcel, adjacent to Kelley Point Park, is being prepared for future expansion of Terminal 6 containers. The private ownership is in two 40-acre sites and one 35-acre parcel on the Willamette River. These sites are too small to accommodate unit trains. A more detailed review of the vacant land is contained in Section 3.3.

2.3.3 Sites in the Portland Area Outside the Portland Harbor

The only alternative sites potentially available in the Portland area are as follows:

A. Ross Island. The use of Ross Island for marine industrial purposes would require extensive fill for the area which has been excavated by Ross Island Sand & Gravel Company. Ross Island is also considered a sensitive environmental area.

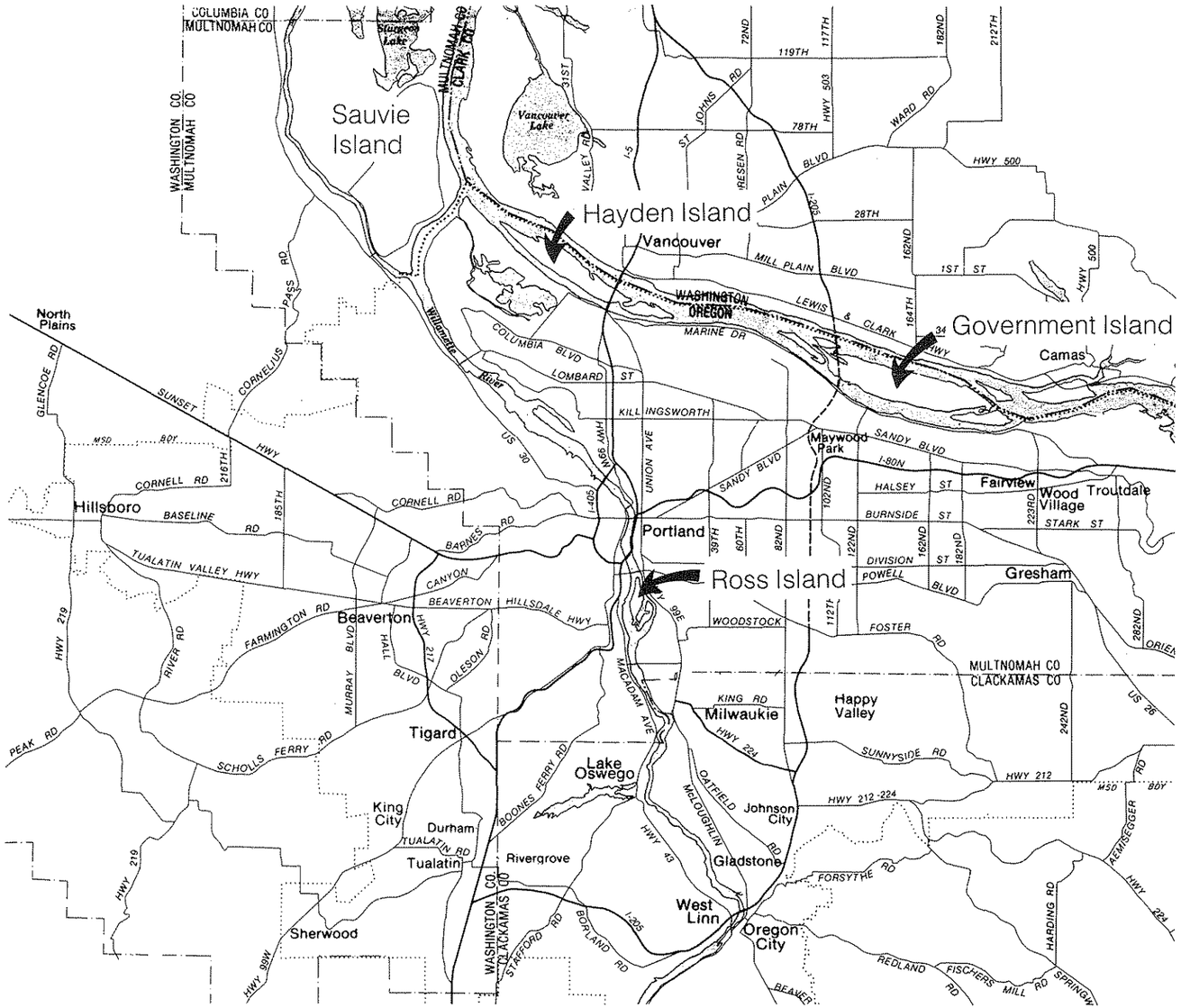
   Ross Island is not on the 40-foot deep-draft river channel, and during high water periods there is insufficient clearance under the Marquam Bridge for oceangoing vessels. Development of Ross Island for marine industrial purposes would also create a need for additional openings of bridges across the Willamette River which provide access to downtown Portland and would thereby increase traffic congestion in the urban area. Ross Island has no existing rail or highway access.

   For these reasons, Ross Island is not a feasible alternative location for the proposed uses.

Portland General Electric

HAYDEN ISLAND

Alternative Development Locations



Benkendorf Associates
Ogden Beeman & Associates

Figure 2.3 - I

PSD006312

B. Government Island. Development of this area would require extending the 40-foot Columbia River navigation channel an additional 10-15 miles. The Interstate 205 Bridge between Government Island and the Oregon mainland is not designed for ship clearance. Avoidance of the low-level south channel bridge would require ships to travel upstream in the main channel to the end of Government Island and then return downstream into the channel.

The island is designated as a natural resource area in the Multnomah County Comprehensive Plan and is zoned Multiple Use Forestry. It is outside the UGB and does not have urban services, rail service, or road access. The majority of the island is also below the 100-year floodplain and would require extensive filling.

For these reasons, Government Island is not a feasible alternative location for the proposed uses.

C. Sauvie Island. Sauvie Island is on the 40-foot Columbia River navigation channel but is a primary farm unit with predominantly Classes I and II soils. Accordingly, the Multnomah County Comprehensive Plan designated it a natural resource area and it is zoned for exclusive farm use. It is outside the UGB and would require an LCDC exception statement to Goal 3, Agriculture, as well as a UGB amendment.

Sauvie Island lacks rail and highway access and would need major roadway improvements to accommodate truck traffic. The island lacks urban services such as a sewer and water system, fire protection, etc. The island is protected from flooding by a rural dike, which is not considered adequate for urban development. The island would require extensive filling to support marine industrial development.

For these reasons, Sauvie Island is not a feasible alternative location for the proposed uses.

D. Vancouver. The Port of Vancouver and The Port Study for the Public Ports of Washington State have identified a need for additional waterfront land to meet the needs of forecasted growth in the Vancouver area. The port has plans to develop a 500-acre parcel downriver from the currently developed area in Vancouver to meet these needs. The site is outside of the UGB and does not currently have urban services or urban zoning.

A master plan study and fill permit will be completed in the future. It is likely the developable area will be less than 500 acres.

There is an industrial park just upstream from the Interstate 5 Bridge; although this land is not on the 40-foot channel, it is used for marine-related activities. The Port of Vancouver currently has 145 vacant acres in the park. Approximately 85 acres are designated for terminal activities, and 60 acres are designated for general industrial activities.

2.4 Alternative Land Uses for the West Hayden Island Site

There are two alternative land uses which could occur on the island under the existing Multnomah County Comprehensive Plan and which would not require a fill permit. These actions define potential future scenarios under the no action alternative.

2.4.1 Grazing

West Hayden Island has been used for cattle grazing and agricultural activities almost continuously since the time of Dr. McLoughlin's Fort Vancouver to the present (Ellis, 1986). Because of the soil types and flooding characteristics, the productivity of other farming activities is limited. The land is currently leased to Portland Livestock Company and used as a holding area for cattle and sheep being shipped to the stockyards. The current tenant has requested permission to clear more woodlands for pasture and construct a feedlot to increase the holding capacity of the land.

2.4.2 Silviculture

The comprehensive plan also allows forestry operations. Soil on most of the island is not productive for most commercial forests, such as fir, pine, or cedar. Interest has been shown in the harvesting of the ash for firewood and the black cottonwood for pulp. Large acreages of land along the lower Columbia River have been leased to grow cottonwoods for pulp. Special trees have been developed which can grow 8 to 10 feet a year. In this operation, trees are planted in rows and harvested every four to six years. West Hayden Island would be suitable for this type of operation.

2.5 No Action

From the Corps' perspective, denying the permit to dredge an access channel and fill the island represents no action.

From the applicant's perspective, a denial of the permit would probably result in Portland Livestock renegotiating their lease and receiving permission to expand their operation. This would likely involve harvesting much of the wooded areas and planting a better quality pasture. For the purposes of habitat impact assessment (Section 4.2), it was assumed 150 acres of cottonwood/ash habitat would be converted to pasture under the no action alternative.

2.6 Comparison of Alternatives

Alternative A, as described in Section 2.1 and contained on the permit request, is the development plan which best meets the objective to develop the West Hayden Island property for marine industrial purposes. Alternative Development Plans A and B would result in more acreage available for development than Alternative C. The quantities of fill material required for all these alternatives cannot be obtained totally from access channel dredging. As a consequence, Alternatives A and B use the site itself as a source of fill material, with approximately 40 to 64 acres committed for excavation. Alternative C would require 4.5 mcy of fill material more than is currently available.

A study of available alternative sites with access to the Columbia and lower Willamette River navigation channel shows that there are no available sites of comparable size within the Portland-Vancouver area. No large uncommitted sites exist in the Portland Harbor; the smaller sites are inadequate to handle the projected demand for marine industrial acreage. A large site at the Port of Vancouver is committed for development to meet the needs of forecasted growth in the Vancouver area. With no alternative sites available, the PGE site on West Hayden Island is the only site considered in detail in the FEIS.

Alternative land uses which would be allowed by the Multnomah County Comprehensive Plan at the West Hayden Island site include agriculture and silviculture. The comprehensive plan's objective to provide marine industrial sites for future needs could not be achieved with the elimination of West Hayden Island as a site. The use of this site for agriculture and/or silviculture is considered the no action alternative, a result of permit application denial.

Table 2.6-I summarizes the environmental effects of the proposed development and no action alternatives.

Table 2.6-I

COMPARISON OF ENVIRONMENTAL EFFECTS

Elements	Alternative A - Basin	Alternative B - Modified Basin	Alternative C - North Shore	No Action
Geology, Soils	The perimeter of the island would be filled to +32 feet NGVD, with slope to +24 feet NGVD at the center. There would be a 64.4-acre basin, -45 feet CRD, in the southeast quadrant on the Oregon Slough side.	Same as Alternative A, except 132.3 acres surrounding the basin would be left in a natural state.	194 acres along the entire south shore would be left undeveloped.	No effect.
Floodplain Loss	Fill in floodplain. Minor fill in floodway would not affect flood heights in Columbia River.	Same as Alternative A.	Same as Alternative A.	None.
Water Quality	Quality would be disturbed during the dredging, which would be limited to noncritical times for fish migration.	Same as Alternative A.	Same as Alternative A.	No effect.
Hydraulic Effects of Dredging	Navigation access channel and turning basin would be dredged to depth of -45 feet CRD. Flow velocities and circulation patterns would not be significantly altered.	Same as Alternative A.	Same as Alternative A.	No effect.
Air Quality	No impact from filling and dredging operations. Future development must meet air quality regulations.	Same as Alternative A.	Same as Alternative A.	No effect.
Terrestrial Species and Habitat	Most vegetation would be destroyed, reducing or eliminating wildlife use of the site. Nearby Great Blue Heron rookery would not be affected, but local habitat would be reduced.	132.3 acres surrounding the basin would be left in a natural state. Habitats remaining include riparian woodland, wetlands, and meadow.	The south shore (194 acres) would remain undeveloped. Habitats remaining include riparian woodland, wetlands, and meadow.	150 acres of cottonwood/ash woodland would be cleared for increased grazing capacity.

Table 2.6-I (cont)

Elements	Alternative A - Basin	Alternative B - Modified Basin	Alternative C - North Shore	No Action
Wetlands	76.5 acres of wetlands would be filled. The remaining three acres would be surrounded by development and reduced in habitat value. Off-site mitigation is proposed.	About 66 acres of wetlands would be filled. About 13 acres of wetlands would remain offering on-site mitigation opportunities.	About 46 acres of wetlands would be filled. About 33 acres of wetlands would remain offering on-site mitigation opportunities.	No effect.
Threatened or Endangered Species	None present.	None present.	None present.	None present.
Aquatic Species and Habitat	Some mortality of sedentary organisms during dredging; minimal impact after completion of this project. Some loss of shallow water area (39 acres), mainly in the Oregon Slough. Creates area (64.4 acres) of new aquatic habitat in basin adjacent to the Oregon Slough.	Same as Alternative A except about 40 acres of new aquatic habitat created from south shore basin.	South shore left undisturbed.	No effect.
Compatibility With Land Use Plans	Implements Multnomah County Comprehensive Plan, including the marine transportation policy. Provides 451.4 acres for development.	Would provide 351.4 acres for development.	Would provide 329.7 acres for development.	Grazing operation expanded.
Economic Effects	Would provide 1,469 new jobs when the site is fully developed. Would increase local, state, and federal taxes by $17 million.	Would provide 819 new jobs and would increase federal, state, and local taxes by $11 million at full development.	Would provide 658 new jobs and would increase federal, state, and local taxes by $9.9 million at full development.	A potential increase of two job opportunities and of $28,000 to the tax base.

Elements	Alternative A - Basin	Alternative B - Modified Basin	Alternative C - North Shore	No Action
Transportation System - Marine	Would increase capacity of marine transportation system in Portland-Vancouver area. There would be a potential for nine marine berths.	This alternative would provide for eight marine berths.	This alternative would provide six marine berths.	No effect.
Transportation System - Land	Increased traffic on local roads and highways. Bridge would be constructed to connect site with North Marine Drive.	Similar to Alternative A except the traffic volumes would be lower.	Similar to Alternatives A and B except traffic volume would be lower.	No effect.
Utilities	All required utilities are available in close proximity to site.	Same as Alternative A.	Same as Alternative A.	No effect.
Aesthetics	Visual character of site would change from natural vegetation and sand beach to industrial development.	The north shore and part of the south shore would change from natural vegetation to industrial development.	The north shore would change from natural vegetation to industrial development. The south shore would remain unchanged.	No effect.
Noise	Would increase noise in local area.	Same as Alternative A except less noise in the basin area.	The north shore would be the same as in Alternative A. The south shore would remain in a natural state.	No effect.
Recreation Effects	Informal recreational use of the site by boaters would no longer be possible.	Some potential recreational use could occur in the mitigation areas.	Same as Alternative B.	No effect.
Cultural Resources	None present at the site.	Same as Alternative A.	Same as Alternative A.	No effect.

3.0 Affected Environment

3.0 AFFECTED ENVIRONMENT

3.1 Physical Environment

3.1.1 Geology and Soils

Similar to other islands in the vicinity, West Hayden Island is composed of loosely consolidated young alluvia (river deposits, underlain by consolidated sand and clay sediments of the Troutdale and Sandy River formations). The bedrock is Columbia basalt. Gravel deposits may be found within 50 to 100 feet of the surface below the water table. The soil types and their location on the island are illustrated in Figure 3.1-I. Characteristics of each are summarized in Appendix B-1.

These soils are characterized by generally poor drainage and a high risk of flooding. All are classified as low-yield agricultural Class VI by the U.S. Soil Conservation Service (USSCS), which is suitable primarily for pasture, range, woodland, or wildlife habitat. One soil classification, the Pilchuck Sand area of 87 acres, is rated as Forest Site Class IV for Douglas Fir by the USSCS, although no Douglas Fir trees are growing on the site and there is no evidence of any in the past. Because of a high seasonal water table, all soils are classified by the USSCS as subject to building and septic tank limitations.

3.1.2 Topography

The natural topography of West Hayden Island has been modified over the years by channel maintenance dredging and controls. A series of five sand groins were installed along the entire south shore in the 1920s to narrow the North Portland Harbor (Oregon Slough), thus increasing natural scouring and reducing maintenance requirements. The north shore has been used extensively as a dredge material disposal area.

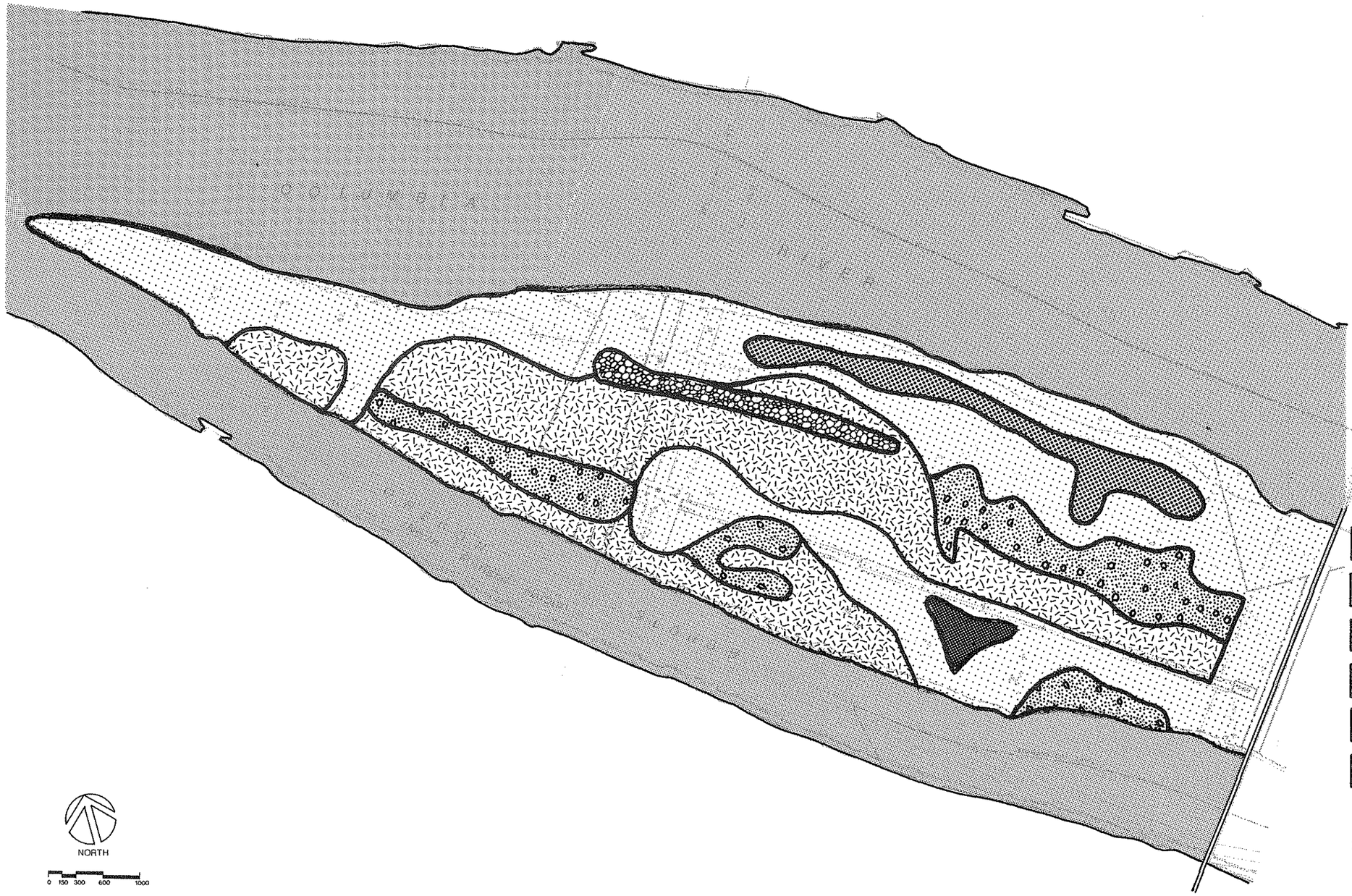
The topography on the island today reflects these actions. Most of the center of the island is at an elevation between +15 to +20 feet NGVD. On the north shore, an 800- to 900-foot strip has been filled to an average elevation of +29 feet NGVD with the dredge spoils material. This strip slopes up from the river to +29 feet NGVD, has a flat top, and then slopes down to the natural interior grades.

On the south shore, the sand groins, created during the 1920s, are still prominent features, rising 10 to 15 feet above the surrounding land. Because of the sandy, dry nature of this material, these mounds are sparsley vegetated.

Portland General Electric

HAYDEN ISLAND

Soils



LEGEND

- Faloma Silt Loam
- Pilchuck Sand
- Pilchuck Sand, Protected
- Rafton Silt Loam
- Sauvie Silt Loam
- Body of Water

NORTH

0 150 300 600 1000

Source: Soils Conservation Service, Multnomah County Branch

Benkendorf Associates
Ogden Beeman & Associates

Figure 3.1-I

III-2

PSD006323

Within the interior of the island, there are several low areas which flood during periods of high water. These areas generally have a low elevation of +10 to +15 feet NGVD. There is only one 0.5-acre pond that holds water year-round on the PGE property and a second pond west of the BPA transmission lines. There are some low areas along the south shore that flood when the river rises to +10 to +15 feet NGVD.

There is a distinct difference in the existing north and south shorelines. Because of the dredging activities along the north shore, it is a gentle 1 to 5 percent slope into the water. The south shoreline slopes to about +10 feet NGVD and then drops abruptly into the water. There is very little beach and very difficult access to the water from the south shoreline. Erosion of the shoreline is much more apparent along the south shore.

3.1.3 Surface Water and Drainage

On West Hayden Island there are no established or ephemeral streams of running water. The island is relatively flat (<3 percent slope) with one permanent pond and a number of seasonal ponds and transitory wetlands in various small, depressed areas. Natural precipitation contributes to these seasonal water bodies through runoff retention in the poorly drained soils. The seasonally high water table created by seepage from the Columbia River into the sand and gravel alluvia underlying these soils also impacts these ponds. The groundwater table, as well as the water levels in the ponds, responds to the river levels.

Most of the project site on West Hayden Island is within the 100-year floodplain and only shoreline areas of the island are in the floodway itself.

3.1.4 Groundwater

The loosely consolidated young alluvial material of the island allows seepage from the Columbia River to form a shallow groundwater table under West Hayden Island. The elevation of the groundwater table responds to the level of the river and the rate of seepage through the alluvia. Groundwater supplies to the eastern, or upstream, end of the island are adequate. Presently, there are no groundwater users on the western end of the island. Activities on the western end of the island should have little impact, if any, on groundwater quality or supplies in the eastern end of the island. Adequate supplies of groundwater for fire protection and other uses can be developed on West Hayden Island if needed. Groundwater quality is good (Cogan, 1982); no potential sources of contamination occur in the area.

3.1.5 River Depths and Currents

The mainstream of the Columbia River flows to the north of Hayden Island, while a secondary channel (Oregon Slough) flows on the south side of the island. Both channels have been the scene of extensive dredging and channel modifications to improve navigability and reduce maintenance dredging requirements. Natural depths in both channels were less than 25 feet prior to river modifications after the turn of the century. Depths in the Oregon Slough, starting 1,200 feet downstream of the railroad bridge (Slough Mile 2 + 4000 feet), are from 27 to 50 feet deep at low water as a result of borrow dredging for the Rivergate Industrial District and for the existing deep-draft navigation channel.

The existing 40-foot channel and turning basin in the Columbia River are along the Washington shore, serving the Port of Vancouver docks. Depths of 20 to 35 feet are common between the navigation channel and Hayden Island. Ogden Beeman & Associates (unpublished, 1981) calculated a 90 to 10 percent flow split between the main stem and Oregon Slough channels at low water. River currents are generally less than 1 foot per second at low water, rising to 4 feet per second at higher flows. During low river flows, the area is subject to a tidal range of between 2 and 3 feet. Daily fluctuations resulting from Bonneville Dam operation can be of equal magnitude.

3.1.6 Water and Sediment Quality

A statistical summary of water quality parameters (Table 3.1-II) for 1980-84 for the Columbia River at Warrendale (RM 141) indicates good river water quality. The only significant influences to water quality in the Columbia between West Hayden Island (RM 105) and Warrendale are the Sandy River, which enters on the Oregon side of the river, and the paper mill at Camas, which discharges on the Washington side of the river. Compared to the volume of water in the Columbia, these additions are small; thus, water quality of the river at Warrendale is a good estimate of Columbia River water quality at Hayden Island.

Oregon water quality standards for the lower Columbia River have been established in Oregon Administrative Rules, Section 340-41-205. Only one (ie, zinc) of the water quality parameters listed in Table 3.1-II exceed Oregon standards. However, "where natural quality parameters of waters of the North Coast-Lower Columbia Basin are outside the numerical limits of the above assigned water quality standards, the natural water quality shall be the standard" (OAR 340-41-205).

Nearby sources of possible water quality degradation include municipal sewage outfall and storm drainage systems. Sewer system discharges are regulated by National Pollutant Discharge Elimination System (NDPES) permits. The volume of flow on the Columbia River and the lack of significant upstream pollution sources result in a high level of water quality at the site.

Table 3.1-II

WATER QUALITY - COLUMBIA RIVER AT WARRENDALE, RIVER MILE 141
1980-1984

Parameter*	Average	Standard Deviation	Coefficient of Variation	Sample Size	Range	Oregon Standard
Temperature (°C)	12.2	±6.4	53	32	2.0-21.0	-
Turbidity	6.5	±7.8	117	35	0.2-39.0	-
Conductivity	163	±31	19	129	105-230	-
Dissolved oxygen	11.0	±1.8	17	34	8.5-15.8	-
Percent DO saturation	100	±11	11	31	70-128	90
pH	7.9	±0.3	4	31	6.7-8.3	6.5-8.5
Alkalinity	61	±10	16	17	42-76	-
Dissolved nitrate-nitrogen	0.24	±0.19	78	33	<0.1-0.9	-
Total phosphorous	0.054	0.026	47	32	0.01-0.13	-
Calcium	18.0	2.1	12	32	13.0-22.0	-
Magnesium	4.9	0.8	16	32	3.4-6.4	-
Sodium	6.3	1.9	31	32	3.2-9.7	-
Potassium	1.3	0.3	21	35	0.7-1.8	-
Chloride	4	2	49	35	1-11	-
Sulfate	12	5	42	32	1-21	-
Fluoride	0.20	0.05	29	32	0.10-0.30	1.0
Silica	10.2	3.3	32	32	5.5-18.0	-
Arsenic (µg/L)	2	1	36	15	1-3	10
Cadmium (µg/L)	<1	-	-	17	<1-2	3
Chromium** (µg/L)	<1	-	-	5	<1-1	20
Copper (µg/L)	4	±4	92	17	0-17	5
Iron (µg/L)	32	±29	90	17	4-99	100
Lead (µg/L)	2.9	±3.3	115	17	<1-9	50
Manganese (µg/L)	2.6	±2.3	90	17		50
Nickel (µg/L)	1.7	±1.4	84	16	<1-6	-
Zinc (µg/L)	16	±10	65	17	4-40	10
Selenium (µg/L)	<1	±0	0	17	<1	-
Total dissolved solids	96	±17	18	32	70-127	500
Suspended solids	20	18	90	26	4-60	-

* All data are in mg/L unless otherwise stated. pH is in standard units. Conductivity is in µmho/cm.

** September 1982-1984.

Data source: U.S. Environmental Protection Agency. STORET. January 1980 to April 1984.

Source of Oregon water quality standards for Lower Columbia Basin: OAR 340-41-205.

In general, sediments in the Columbia River are nearly 100 percent fine- to medium-grain sand and are constantly cleaned and redistributed by river currents during annually occurring freshets. Columbia River borings taken in the proposed access channel contain fine to coarse gray sand with scattered amounts of gravel (Dames and Moore, 1985). Suspended sediments in the Columbia River are primarily from erosion or weathering of rock in the drainage basin. Of the biological materials in the suspended sediments, over 90 percent are diatoms, which are silica. The remaining suspended sediments are organic detritus common to most rivers.

No sediment samples were collected in Oregon Slough for this project. However, samples taken at the Port of Portland's Terminal 6 downstream contained higher levels of silt and fine material than the Columbia River sediments. This material was determined to be suitable for in-water disposal based on chemical testing (CH_2M-Hill, 1983). There is no reason to believe the sediments within the proposed project area are more contaminated than those present at the Terminal 6 location. Sediment sampling will be conducted prior to permit issuance to assist in designing the disposal areas to allow for settling of all sediments.

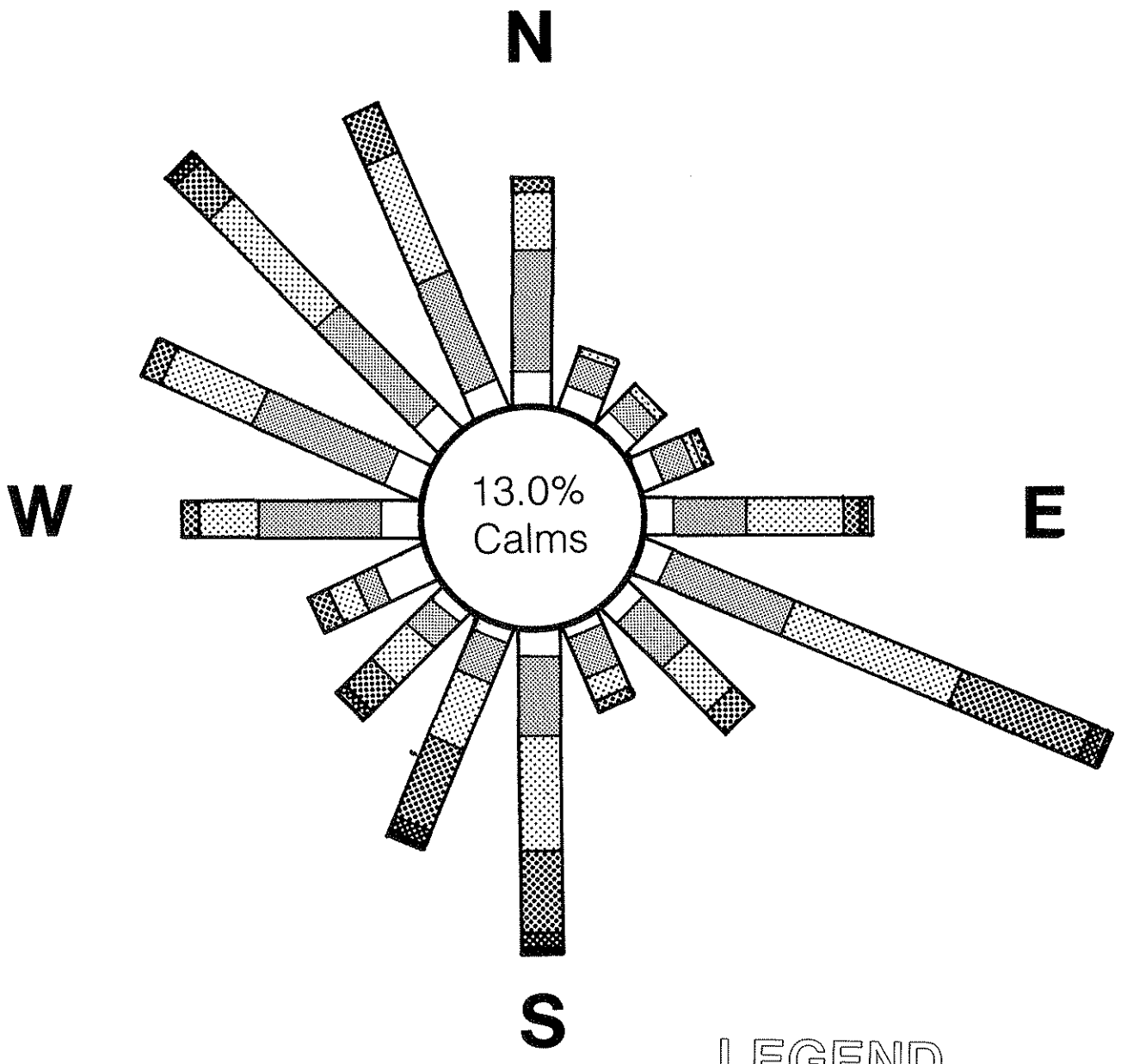
There are no known nearby sources of contaminants to the sediments of Hayden Island which would cause adverse impacts when dredged materials are used for fill. There are also no sources of radioactive materials in the local area that would adversely affect the use of the Columbia River sediments for fill.

3.1.7 Climate and Air Quality

West Hayden Island is situated about 65 miles inland from the Pacific coast, midway between the coastal mountain range on the west and the Cascade mountain range to the east. This location between mountain ranges provides limited shielding from the Pacific Ocean and a barrier to continental air masses originating from the eastern interior region.

The steep western slope of the Cascade range lifts highly moist westerly winds from the Pacific Ocean, resulting in moderate rainfall amounts for the region. Precipitation occurs primarily during the winter season and is mostly in the form of rain. Precipitation statistics from the closest National Weather Service station, the Portland International Airport (PIA), 1976-1985, are presented in Appendix B-6.

Existing wind patterns in the Hayden Island area are best defined by the PIA, located approximately five miles to the east. An annual wind rose, prepared from PIA wind data, is presented in Figure 3.1-III. Winds from the east-southeast, south, and northwest have the highest frequencies during the year. These results agree with the configuration of the Columbia River valley, which is the dominating influence on winds in that area. The wind rose also agrees with the seasonal airflow patterns for this area which are typically northwestern in spring and summer and southwestern in fall and winter.



LEGEND

1 - 2 3 - 5 6 - 9 10-15 16-25 + 25

Speed Classes (MPS)

0 1 2 3 4 5 6 7 8 9 10

Scale (Percent)

Portland International Airport
Annual Wind Rose 1965 - 1974

Source: Portland General Electric Environmental Sciences Department

Figure 3.1 - III

The predominance of marine air in this area results in mild temperatures throughout the year. The coolest temperatures occur during winter and are normally associated with movements of cold air from the continental interior. Summers are usually accompanied by mild temperatures and very little precipitation. Fall and spring months are mainly transitional periods, and particularly in the fall or early winter period, there is the highest occurrence of fog. Appendix B-7 contains the average temperature results for the period 1976-1985 recorded at the PIA and provides an example of the typical temperatures that occur in this area.

Hayden Island is located in the Portland Interstate Air Quality Maintenance Area (PIAQMA). Presently, this airshed is classified as a nonattainment area for ozone. This is due to 1983 ozone levels exceeding the primary National Ambient Air Quality Standard. All new emission sources of volatile organic compounds (VOC) in this area are subject to specific restrictions involving pollution control equipment. In addition, new "major sources" of VOC emissions may be required to reduce existing emission sources (offset the new source's emissions) in the airshed.

Specific areas within the PIAQMA are designated as being nonattainment for total suspended particulate (TSP). Hayden Island is not located in these areas; however, there is one nonattainment area located only a few kilometers away. New TSP emission sources may be required to comply with nonattainment regulations if the sources impact the nonattainment area.

The downtown Portland area is presently a nonattainment area for carbon monoxide. Hayden Island is located far from this nonattainment area and is not subject to the restrictive regulations. All the remaining pollutants, sulfur dioxide, nitrogen dioxide, and lead, are in compliance with federal and state standards in this airshed.

A review of Oregon and Washington states' ambient monitoring data was performed to identify the existing air quality levels in the Hayden Island area. A comparison of these data with the state and federal standards (Appendix B-5) shows only the carbon dioxide standard (8-hour) was exceeded during 1983. This may not be representative of actual conditions in the Hayden Island area since the monitoring location was in downtown Portland and was probably influenced by local transportation sources. Likewise, the high TSP monitoring results recorded at Terminal 2 in Vancouver, Washington, might have been due to local particulate sources in the area. Presently, these state monitors are the best indicators of existing air quality near Hayden Island.

3.2 Biological Environment

3.2.1 Terrestrial Species and Habitat

A. Vegetation

The West Hayden Island site is characterized by five habitat types (Figure 3.2-I): cottonwood/ash (228 ac), meadow (95 ac), dredge material (77 ac), herbaceous wetland (48 ac), wooded wetland (32 ac), and beach (16 ac). Riparian vegetation on West Hayden Island, dominated by Black Cottonwood and Oregon Ash, is typical of habitat found along the lower Columbia River (Franklin and Dyrness, 1973). The Corps (1976) estimates 9,276 acres of similar wooded habitat exist between RM 79 and RM 145 of the Columbia River. The cottonwood/ash and wooded wetland habitat on West Hayden Island, therefore, represent approximately 2.5 percent of riparian habitat located along this section of the Columbia River.

Dense understory vegetation is associated with the riparian habitat. Species include Wild Rose, blackberry, Red-osier Dogwood, Red Elderberry, and Snowberry. Various species of willow occur in areas of poor drainage and in close proximity to the river's influence.

Various grasses and herbaceous species, such as Bitter Cress, White Clover, Wooly Mullein, English Plantain, False Dandelion, and Tansy Ragwort are common plant constituents of meadow habitat on West Hayden Island. Many of these species are indicative of a disturbed habitat condition (ie, presence of "weed" and introduced species) primarily as a result of occasional flooding and grazing by sheep and cattle. West Hayden Island has a long history of agricultural use (primarily cattle) since it was first settled by Euro-Americans in the 1850s (Ellis, 1986). Sparse meadow habitat is located along an existing transmission line corridor. An expansive meadow zone lies south of and adjacent to the dredged material disposal site along the north shore.

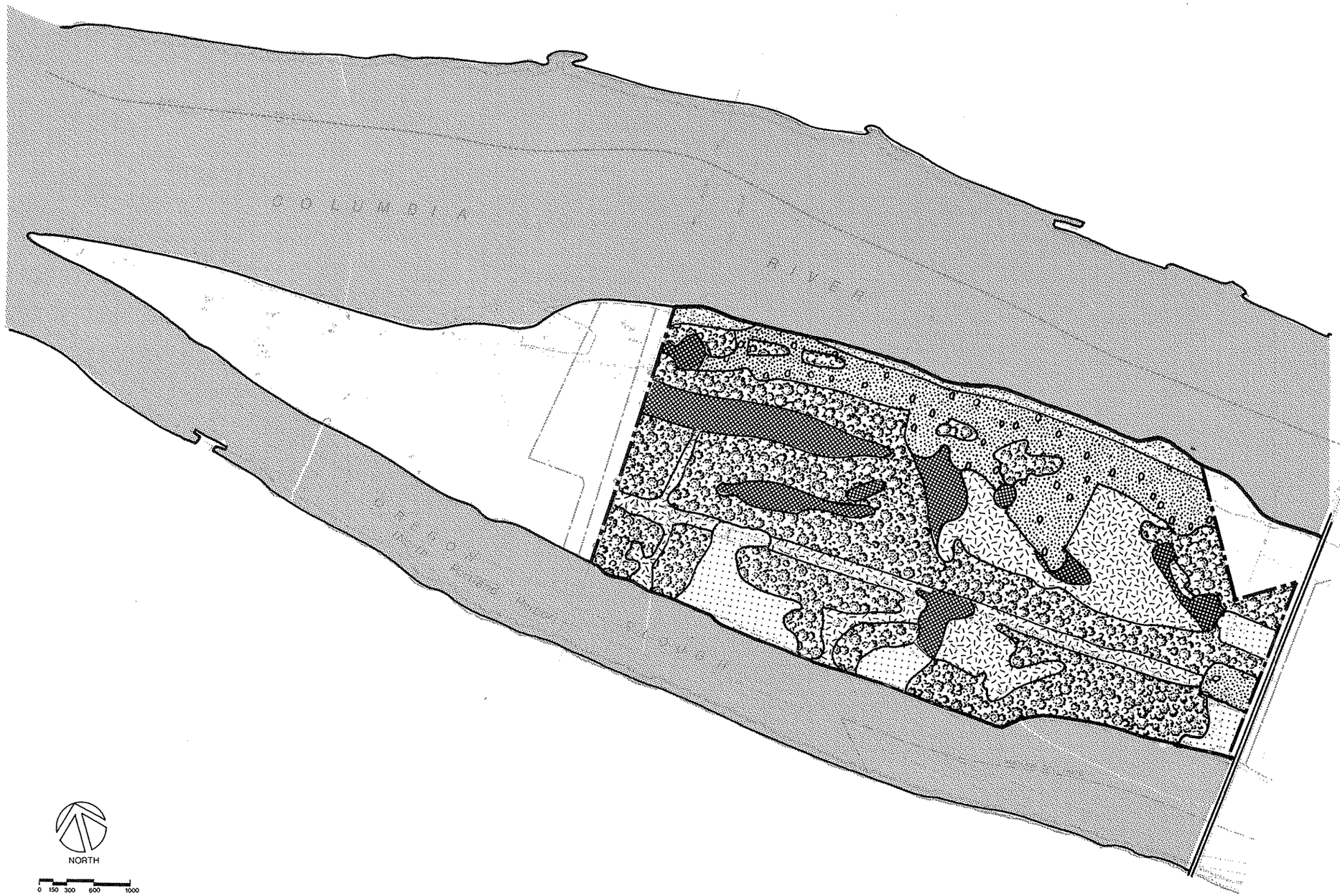
Some portions of West Hayden Island have recently been used for disposal of dredged materials from the Columbia River (Corps, 1975[a]). Vegetation in this area is sparsely distributed and consists mainly of "weed" or introduced species such as dock, Skunkweed, plantain, Stinking Dogfennel, Canadian Thistle, Bull Thistle, and Common Dandelion. Dredge materials are restricted to the northern portion of the project site (Figure 3.2-I).

A total of 79.5 acres of wetland have been identified on West Hayden Island. Because wetlands are of special public concern and require a Corps permit to be filled, they will be discussed separately in Section 3.2.2.

Portland General Electric

HAYDEN ISLAND

Habitat Types



LEGEND

- Cottonwood-Ash
- Herbaceous Wetland
- Wooded Wetland
- Meadow
- Dredge Material
- Beach

Benkendorf Associates
Ogden Beeman & Associates

Figure 3.2-I

PSD006331

Sandy beaches occur along the north shore of the project site. The shoreline slope is gradual and is void of vegetation. The primary source of sand is from dredge material deposits. This contrasts sharply to the south shore, which is characterized by steep banks and riparian vegetation to its edge.

Vegetation species composition surveys were conducted from 1980 to 1983. Based on the classification system developed by Hitchcock and Cronquist (1973), 116 species have been identified on West Hayden Island (Appendix B). The presence of nuisance species (eg, Canadian Thistle, Tansy Ragwort) and introduced or nonnative species (eg, Teasel, Diffuse Knapweed) in much of the open areas indicates habitat in a disturbed condition. The disturbance is primarily due to grazing, dredged material disposal, and occasional floodin

Currently, over 40,000 acres of undeveloped land with characteristics similar to that found on West Hayden Island (ie, riparian woodland interspersed with open agricultural areas) exist between Sauvie Island, the mouth of the Sandy River and the lower Willamette River from Ross Island to the mouth (Table 3.2-II). The West Hayden Island project site represents about 1.2 percent of these habitat types.

B. Wildlife

The vegetation on West Hayden Island provides habitat for a wide variety of birds, mammals, amphibians, and reptiles. In particular, birds are the most diverse and abundant wildlife component on the project site. Spring and fall bird surveys conducted in 1982 indicate bird densities of about 900 birds/100 acres. Dominant species included House Finch, American Goldfinch, Wilson's Warbler, Song Sparrow, Brewer's Blackbird, Brown-headed Cowbird, European Starling, American Robin, Black-capped Chickadee, Tree Swallow, and Northern Oriole. A total of 78 bird species has been observed on West Hayden Island (Appendix C-3).

Total bird community density on the project site was less than bird density results of previous studies conducted in the vicinity. Bird census work in similar habitat along the lower Columbia River resulted in an average density of 1,690 birds/100 acres (Corps, 1976). These density differences may be due to year-to-year natural variation, differences in habitat quality, and/or survey methodology. However, species composition and relative abundance of birds on West Hayden Island can be considered typical of bird assemblages in the area. West Hayden Island bird density results for individual species are listed in Appendix C-3, Tables B and C.

Use of West Hayden Island by waterfowl is chiefly restricted to the winter months when optimum water conditions exist.

Table 3.2-II

COLUMBIA RIVER HABITAT DATA[a]

[Acres of undeveloped land (including agricultural) along the Columbia River from Sauvie Island to the mouth of the Sandy River and the lower Willamette River.]

Site	Acres
Sauvie Island	24,000[b]
Smith/Bybee Lakes	1,900[c]
Government Island	1,900
Columbia Corridor (south shore)	1,744
Columbia Slough	266
Sandy River Delta	1,832
Vancouver Lake	2,600
Inlet and Outlet to Post Office Lake	4,000
Ross Island	159
Oaks Bottom	163
Sand Island	78
Lady Island	500
McGuire Island	228
Lemon Island	149
Sand Island	75
West Hayden Island	762
TOTAL	40,356

a Data compiled by Benkendorf Associates, Portland, Oregon.

b Includes 12,000 acres of Sauvie Island Wildlife Management Area.

c Includes 100 acres of landfill and 100 acres of Columbia Slough.

Eight species have been observed on the project site along the shore and in flooded areas. A limited amount of nesting may also occur as indicated by the presence of Mallards and Wood Ducks during the May 1982 bird surveys. A pair of Canada Geese were observed nesting on a dolphin piling in the Oregon Slough adjacent to the site on April 25, 1984. Geese nested again and produced young in 1986. Although some waterfowl use does occur on West Hayden Island, areas surrounding the site (ie, Sauvie Island and Smith, Bybee, and Vancouver lakes) are significantly more important to waterfowl.

Surrounding natural areas also offer habitat to a wide variety of shorebirds (eg, Great Blue Heron, Western Sandpiper, Greater Yellowlegs). An active Great Blue Heron rookery exists in the industrial area adjacent to the northwest corner of Delta Park Golf Course. No known nesting colonies exist on West Hayden Island, but this species is a common visitor to the site. Shorebirds primarily use suitable habitat in the vicinity during the fall and spring migratory periods.

The understory vegetation of riparian habitat and herbaceous species of open areas on West Hayden Island provide food and cover for several mammals. To date, Townsend's Mole, Eastern Cottontail, Beaver, Raccoon, and Black-tailed Deer have been observed on-site. However, based on habitat requirements and distribution of Pacific Northwest mammals (Ingles, 1965; Larrison, 1976; Verts, 1978), 36 species are likely to occur on West Hayden Island (Appendix C-4).

Eight species of amphibian and 10 species of reptile are likely to occur on the project site (Appendix C-5). Of these, Pacific Treefrog, Red-legged Frog, Bullfrog, and Red-spotted Garter Snake have been observed on the island. Beaches, wetlands, meadows, and woodland understory vegetation provide a variety of habitat to both these groups. Lizards and snakes utilize the drier portions of the site (ie, road edges, brush, upland meadows, and woodland), and turtles, frogs, and salamanders can be found in the vicinity of ponds, river shoreline, and under moist leaf litter in the woodland.

C. Habitat Evaluation Procedures (HEP)

In 1984, an interagency committee was formed to develop and implement quantitative habitat evaluation procedures (HEP) that would document the value of various habitats on West Hayden Island. HEP committee members included biologists from PGE, Oregon Department of Fish and Wildlife, U.S. Fish and Wildlife Service, Audubon Society of Portland, and the U.S. Army Corps of Engineers. HEP was implemented to provide a basis for impact assessment of the three proposed

development alternatives and provide a basis for mitigation planning.

This approach to habitat evaluation was developed by the U.S. Fish and Wildlife Service (USFWS, 1980) and utilizes a species/habitat approach for quantifying relative habitat values. A number of animal species are selected for a particular area. Each species has various habitat needs that are documented in a Habitat Suitability Index (HSI) model. HSI models primarily focus on the measurement of physical and chemical habitat variables which are used to calculate an index to habitat quality. The model includes information on habitat use, model structure, assumptions, application, and references.

The habitat in a study area is compared to optimum habitat (defined in HSI model) for a species to result in an HSI. The HSI is a number between 0 and 1:

0 represents no habitat suitability

1 represents optimum habitat suitability

The HSI is multiplied by the number of acres of a particular habitat in the study area to obtain Habitat Units (HUs).

(HSI) * (Acres) = HUs

1 HU = 1 acre with optimum habitat suitability

To determine the impact of a proposed action, the existing or baseline habitat condition is compared to predicted future habitat conditions at predetermined Target Years (TY). Target Year 0 (TY0) represents baseline conditions. Target Year 1 (TY1) represents the first year land and/or water use is expected to change. Other TYs are selected up to the completion of a proposed action or the end of the economic life of the action.

Using the same HSI models, the area of available habitat and HSIs are estimated for each evaluation species and future TY. HUs are determined for each TY and annualized by summing HUs throughout the analysis period and dividing by the number of years in that period (in this case, 40 years). This results in Average Annual Habitat Units (AAHU). Annualization of HUs facilitates the comparison of various alternative actions for impact assessment.

The following species were selected by the West Hayden Island HEP committee to determine the relative value of wildlife habitat:

1. Great Blue Heron (Ardea herodias)

2. Wood Duck (Aix sponsa)

3. Red-tailed Hawk (Buteo jamicensis)

4. Downy Woodpecker (Picodes pubescens)

5. Yellow Warbler (Dendroica petechia)

6. Common Yellowthroat (Geothlypis trichas)

7. American Goldfinch (Carduelis tristis)

8. Brush Rabbit (Sylvilagus bachmani)

9. Townsend's Vole (Microtus townsendi)

10. Pacific Treefrog (Hyla regilla)

Criteria for species selection included abundance on the project site, habitat use, sensitivity to habitat change, ecological role, and public interest in the species.

Habitat use in relation to food, reproduction, and cover requirements of candidate species was particularly important in final species selection. Selected species ranged from having specific habitat preferences (eg, Wood Duck) to species utilizing all habitat types on West Hayden Island (eg, Red-tailed Hawk). Because birds are the major wildlife component on the project site, seven of the evaluation species represent this group.

Published or draft HSI models were available from the U.S. Fish and Wildlife Service for the Great Blue Heron, Wood Duck, Red-tailed Hawk, Downy Woodpecker, and Yellow Warbler. HSI models for the Common Yellowthroat, American Goldfinch, Brush Rabbit, Townsend's Vole, and Pacific Treefrog were developed by the West Hayden Island HEP committee based on literature reviews. Some of the published models were slightly modified to reflect conditions on West Hayden Island.

Field studies were conducted in June 1985. Twelve sampling areas were established to collect habitat data relative to the requirements of the HSI models for West Hayden Island. Forty habitat variables were measured for the HEP analysis.

Table 3.2-III depicts the baseline or existing HSIs for the selected West Hayden Island evaluation species. Habitat suitability ranged from 0.0 for the Common Yellowthroat in herbaceous wetland to 1.0 for the American Goldfinch in dredge material habitat. The HSIs were converted to HUs to indicate baseline habitat conditions on West Hayden Island for each species.

Table 3.2-III

WEST HAYDEN ISLAND HABITAT EVALUATION
BASED ON SUITABILITY FOR 10 SELECTED WILDLIFE SPECIES

[Results expressed as the Habitat Suitability Index (HSI) converted to Habitat Units (HUs).]

Species	Habitat Type	Acres	HSI	HUs
Great Blue Heron	Cottonwood/ash	228	0.88	201
	Wooded wetland	32	0.88	28
Wood Duck	Wooded wetland	32	0.05	2
Red-tailed Hawk	Cottonwood/ash, wooded wetland, meadow, herbaceous wetland, dredge material	480	0.78	374
Downy Woodpecker	Cottonwood/ash	228	0.50	114
	Wooded wetland	32	0.50	16
Yellow Warbler	Wooded edge	17	0.91	16
Common Yellowthroat	Herbaceous wetland	48	0.00	0
	Wooded edge	17	0.96	16
American Goldfinch	Meadow	95	0.77	73
	Dredge material	77	1.00	77
Brush Rabbit	Wooded edge	42	0.77	32
Townsend's Vole	Meadow	95	0.80	76
Pacific Treefrog	Cottonwood/ash	228	0.85	194
	Wooded wetland	32	1.00	32
	Herbaceous wetland	48	1.00	48
	Meadow	95	0.85	81

West Hayden Island provides relatively high habitat suitability for the Great Blue Heron, Red-tailed Hawk, Yellow Warbler, American Goldfinch, Townsend's Vole, and Pacific Treefrog. In contrast, the project site offers only marginal habitat for the Wood Duck and Common Yellowthroat.

Cottonwood/ash habitat is the most extensive habitat type on West Hayden Island. Complex habitat structure (ie, tree/shrub/herb layer, snags) and minimal disturbance from human activities are factors that potentially provide good wildlife habitat in this area. For example, proximity to an existing heron rookery, nearby foraging areas, minimal human disturbance, and potentially good nest sites in the wooded areas resulted in an HSI of 0.88 for the Great Blue Heron. The edges of the wooded areas provide near optimum habitat for the Yellow Warbler (HSI = 0.91).

Although Downy Woodpeckers are common on the project site, the wooded habitat is only moderately suitable for this species (HSI = 0.50). This species prefers more open wooded areas for feeding. Wooded habitat on West Hayden Island greatly exceeds the evaluation criterion for foraging (ie, tree basal area 467 sq ft/ac compared to 44 to 87 sq ft ac optimum) thus reducing its suitability to Downy Woodpeckers and possible other tree bark probers.

Brush Rabbits prefer small (< 2 ac), dense patches of vegetation interspersed with open areas for feeding. West Hayden Island habitats in general are not distributed in a patchy configuration, but rather in large "strips" of habitat (Figure 3.2-I). Although the habitat types preferred by the Brush Rabbit are present, they are not arranged in an optimum pattern. Other habitat variables were found to be optimum, resulting in an overall HSI of 0.77.

Brush Rabbit sightings on West Hayden Island are rare and Eastern Cottontails (Sylvilagus floridanus) are relatively abundant on the island. Cottontails also require open space for feeding and adequate escape cover. However, habitat requirements are much less specific than Brush Rabbit habitat needs (Allen, 1984). The more adaptive nature of the Eastern Cottontail and the location of West Hayden Island in the northern limit of Brush Rabbit distribution may account for the abundance of cottontails and the scarcity of Brush Rabbits.

Wooded wetland was evaluated as a potential breeding area for Wood Ducks. Although this habitat type provides several nesting trees, brooding habitat is nearly absent on the project site. As a consequence, West Hayden Island only provides marginal wooded wetland habitat (HSI = 0.05) for Wood Ducks.

Herbaceous wetland on the project site is suitable to a limited number of wildlife species. These areas are subject to a great deal of disturbance by livestock and are intermittenly flooded. The average height of vegetation is relatively low (ie, 16 inches), which offers limited cover for many species. This habitat condition is reflected in the HEP results for the Common Yellowthroat. Because yellowthroats require vegetation at least 3 feet tall, habitat suitability is zero in herbaceous wetland on West Hayden Island. However, in view of Pacific Treefrog habitat requirements, this habitat type resulted in an HSI of 1.0. Treefrogs do not require a permanent water body for survival, and cover needs are not particularly restrictive.

Meadow habitat quality is relatively high as indicated by the HEP results for the Townsend's Vole (HSI = 0.80). These results also infer that the meadow areas are capable of supporting small mammal populations which can supply food to various predators such as the Red-tailed Hawk. The presence of Red-tailed Hawks on West Hayden Island indicate the open areas such as meadow habitat provide adequate foraging opportunities. Red-tailed Hawks utilize all habitat types studied on West Hayden Island, which overall had an HSI of 0.78.

The 77 acres of dredge material on West Hayden Island is sparsely vegetated and does not receive intense use by wildlife. However, the plants present do produce an abundance of seeds which are readily utilized by American Goldfinches. HEP analysis reflects this optimum habitat condition for goldfinches with an HSI of 1.0 (food life requisite).

3.2.2 Wetlands

There are 79.5 acres of wetland on West Hayden Island (Figure 3.2-III). This habitat consists of wooded wetland (approximately 32 acres), dominated by Black Cottonwood, willow, horsetail, Bittersweet Nightshade, Reed Canarygrass, and Moneywort; and herbaceous wetland (approximately 48 acres) situated in topographic depressions which are seasonally flooded (Columbia River high water, elevated groundwater). Vegetation characteristic of herbaceous wetland includes Reed Canarygrass, sedge, spike rush, rush, and Smartweed. Wetlands on the project site represent about 2 percent of similar habitat found between RM 79 and RM 145 (USACE, 1976).

Because of the ephemeral nature of most wetlands on West Hayden Island (except one permanent pond), major use of these areas by aquatic wildlife is primarily restricted to the winter and spring months. As a consequence, West Hayden Island wetlands are not normally suitable breeding sites for many wetland wildlife species but may serve as breeding sites for amphibians and brooding sites for some waterfowl species (eg, Wood Duck). These areas also provide temporary feeding and resting locations.

Habitat evaluation studies conducted in 1985 [Section 3.2.1(C)] also indicate a limited value of these wetlands to selected wildlife species (ie, Wood Duck, Common Yellowthroat). The herbaceous wetlands lack the cover many wildlife species require for survival. Use of these areas by livestock significantly contributes to the degradation of wetland habitat value on West Hayden Island.

3.2.3 Aquatic Species and Habitat

A. Fish

Resource Description

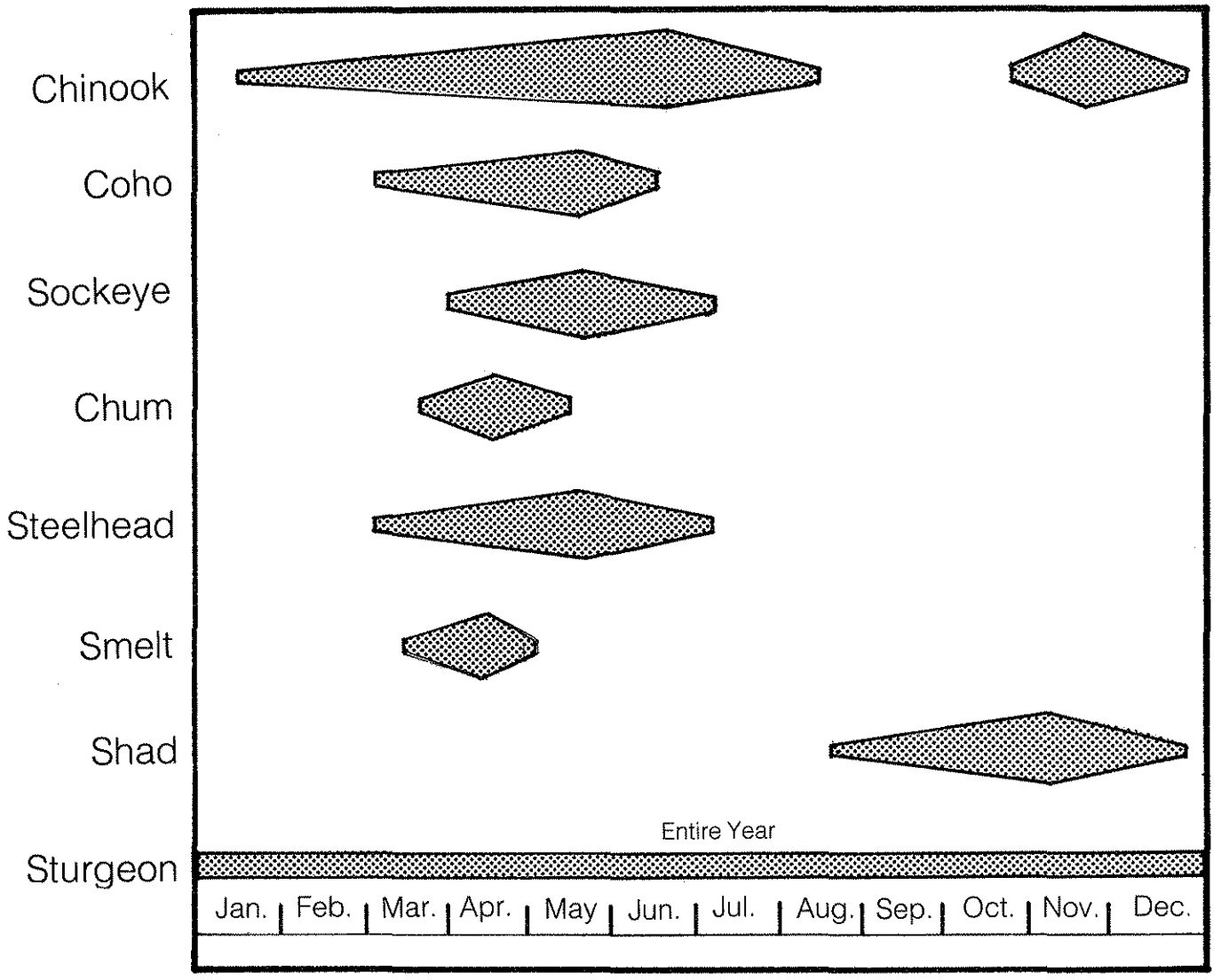
The lower Columbia River and its sloughs sustain a varied population of anadromous and resident fish species. Anadromous species (ie, salmonids, shad, smelt) and sturgeon are harvested recreationally and commercially and contribute significantly to the economy of the area. (The main commercial fishery is concentrated downstream of Hayden Island.) Warmwater game and nongame species are primarily a recreational resource and include fish such as perch, catfish, and sunfish. Appendix C-6 lists the fish in the vicinity of Hayden Island and their relative abundance and importance as a resource (biological and economical).

Throughout the history of the lower Columbia River fishery, salmonids have been the most important species of the area. For thousands of years, Indians depended on the salmonids for their sustenance, and for over a century, the non-Indian fishery has harvested these fish commercially and recreationally. Intensive fishing, dams (irrigation, flood, and power), mining, logging, overgrazing, and pollution have directly and indirectly contributed to a drastic decline of the fish runs. As a result, since the late 1800s, population levels of salmonids have been increasingly dependent upon fish released from state and federal hatcheries. Currently, more than one million hatchery-produced or naturally reared adult salmon and steelhead return to the Columbia River annually (King, 1984).

Migratory Fish

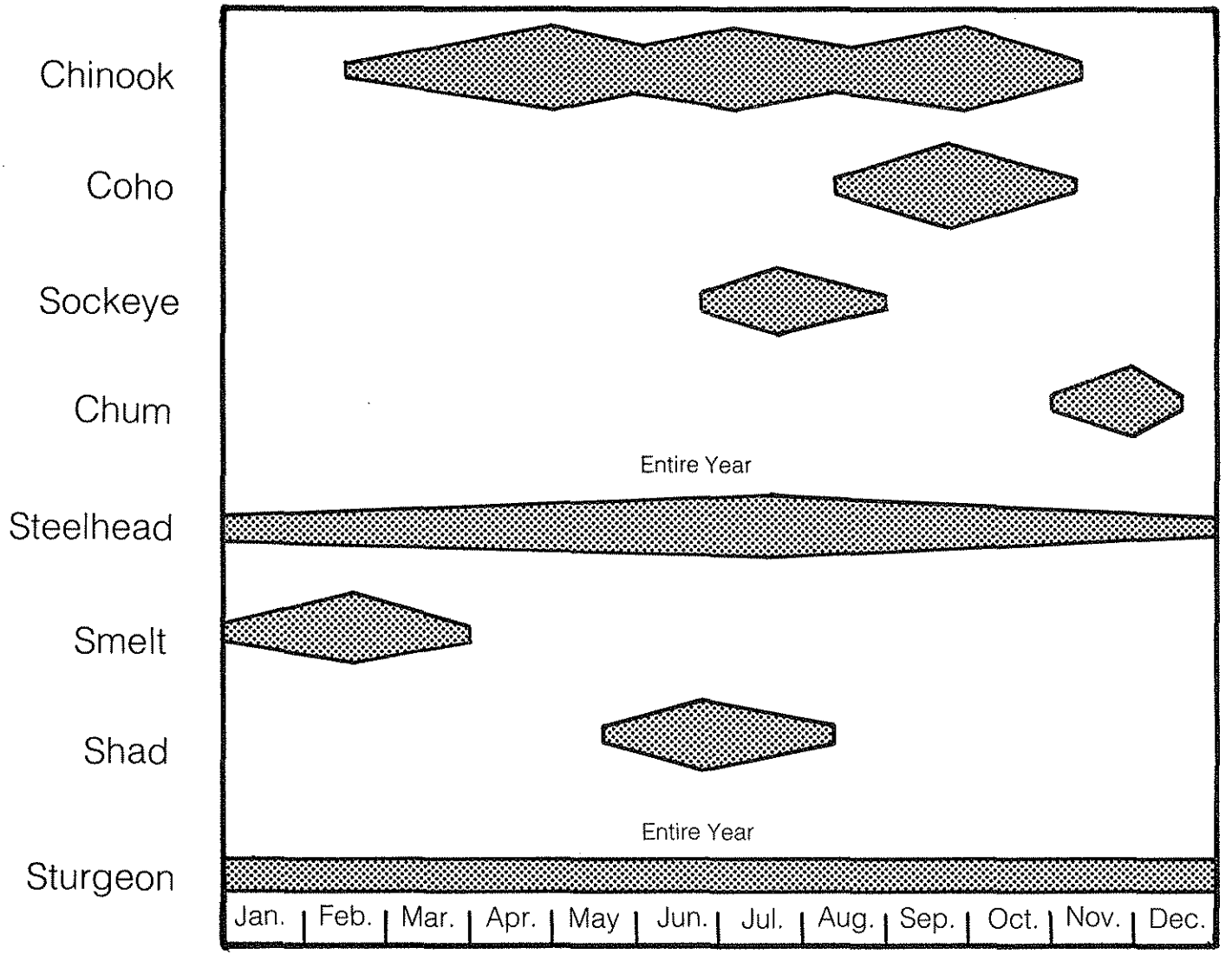
Figures 3.2-IV and 3.2-V summarize occurrence of juveniles and adults of the current economically important species in the Columbia River adjacent to Hayden Island. These fish include chinook salmon, coho salmon, sockeye salmon, chum salmon, steelhead trout, smelt (eulachon), American shad, white sturgeon, and cutthroat trout.

Adult chinook are found in the lower Columbia virtually the entire year (February to November) with peaks of migration corresponding to the spring, summer, and fall runs (March/April, June/July, and September). The fall run, which is divided into lower (tule) and upper (brights) river runs, is



Timing of Juvenile Migrations Past Hayden Island

Figure 3.2 - IV



Timing of Adult Migrations Past Hayden Island

Figure 3.2 - V

currently the largest, followed by the spring run and a very depleted summer run. A limited commercial gill net fishery of the spring and fall runs in the lower Columbia is still allowed, but commercial harvest of the summer run has been closed since 1964. Sport fishing seasons have varied from year to year; however, since 1978, angling for chinook has been greatly reduced.

Coho salmon adults are found in the lower Columbia from August through October with peak numbers occurring in late August and September. Coho are now considered predominantly a lower river species and are primarily supported by hatcheries on the lower river tributaries, which have produced average returning runs of nearly one-half million since 1969. They are harvested yearly by both commercial and sport fishermen.

The main run of sockeye or blueback salmon ascends the Columbia in June and July. They are mainly an upriver fish, spawning in tributaries to lakes. The fry reside from one to three years in a lentic (still water) habitat before their outward migration in May or June. Until 1984 and 1985, the last sizable runs of sockeye were in the 1950s. In 1984 and 1985, 161,000 and 200,000, respectively, were counted over Bonneville Dam. The total Columbia River commercial fishery harvested 80,000 sockeye in 1985. The sockeye salmon does not contribute to the lower river sport fishery.

Chum salmon enter the lower Columbia and other coastal streams primarily in November. Very few Columbia River tributaries support native runs of chum salmon. However, two major spawning streams, Hardy and Hamilton, are located upriver of Hayden Island. Washington, Oregon, and local interests have expended considerable time and money into augmenting stocks in the Columbia River, and there is an expanding commercial fishery in the estuary. In the Columbia River system, chum salmon are not considered a sport fish.

Two main runs of steelhead ascend the Columbia, and adults are found in the lower river throughout the year. The winter run fish enter the river from November through April and spawn largely in tributaries below Bonneville Dam. The summer run, mostly comprised of upriver fish, is present from May through October, peaking in June through September. The steelhead is considered a game fish and has not been harvested commercially in the lower river since 1975. Both runs are fished extensively for sport in the mainstream Columbia and its tributaries.

Adult sea-run cutthroat enter the Columbia River July through November, returning to spawn in tributaries primarily below Bonneville Dam. The estimated recreational

catch in 1985 was 3,400. Ninety-two percent of these fish were taken at or below the Cowlitz River mouth (King, 1986), approximately 35 miles downstream of Hayden Island. There is no commercial fishery on cutthroat.

Smelt runs occur yearly in the lower Columbia, spawning mainly in the Washington tributaries of the Cowlitz, Lewis, and Kalama rivers 25 to 35 miles downriver from Hayden Island. Most years, smelt migrate past Hayden Island, presumably bound for the Sandy River spawning area. Size and occurrence of this run are unpredictable. When the run occurs, smelt are present from December through March, usually peaking in February. Smelt are taken by both sport and commercial fishermen in the lower Columbia.

American shad were introduced into the Columbia River in the 1870s and since then have developed into a significant sport fishery. Spawning occurs in the lower Columbia and its tributaries, including the Willamette, and in reservoirs above the dams. A minimum of one million adult fish (Bonneville Dam counts) move past Hayden Island each year. Peak migration occurs in June.

White sturgeon are abundant year-round throughout the main stem lower Columbia and lower Willamette River. With the limited recreational salmon seasons since 1973, sturgeon have become the principal sport fish of the lower river. They move considerable distances between feeding areas and spawning areas and are caught throughout the year. They are legal to take in the sport fishery between lengths of three to six feet (9 to 20 years of age). An estimated 729 sturgeon were caught by Oregon anglers in the Hayden Island area in 1985 (King, 1986).

None of the economically important anadromous species are known to spawn in the Oregon Slough or Columbia River in the area of Hayden Island. Although not specifically reported, potential sturgeon spawning and feeding areas may exist off the island, particularly in the Oregon Slough.

No specific data are available concerning actual use of the waters off Hayden Island for rearing or feeding by juvenile migratory species. However, an estimated 50 million to 100 million juveniles migrate past the island each year, along with at least an equal number of juvenile shad. The main downstream migration of the salmonids and smelt occurs in April, May, and June. In October and November, another migration peak occurs which is comprised of juvenile shad and hatchery releases of spring chinook smolts. Juvenile sturgeon are in the area year-round.

Warmwater and Nongame Fish

Warmwater game and nongame fish are also abundant in the lower Columbia and its backwaters and sloughs, and a variety of species are found off Hayden Island in the mainstream Columbia and the Oregon Slough. Fishery agencies (Fies, 1971; Durkin and McConnell, 1973) and PGE (1975) have sampled waters similar to those off Hayden Island, both upstream and downstream of the island. Gill net and beach seine catches of game fish included yellow perch, white crappie, black crappie, bluegill, largemouth bass, smallmouth bass, black bullhead, yellow bullhead, brown bullheads, and mountain whitefish. Nongame species included carp, largesucker, chiselmouth, peamouth, squawfish, lamprey, trout-perch, stickleback, sculpins, starry flounder, and shiners. Walleye have reportedly been caught by sport fishermen downstream from the project site, and populations possibly occur near Hayden Island.

The Oregon Slough in the planned development area is suitable habitat for warmwater fishes. Tall grasses, fallen and overhanging trees, dolphins, and log rafts provide cover along much of the shoreline; and current velocity is less than that off the north shore.

The slough's littoral zone is characterized by a variety of habitat types which are conducive to warmwater fishes. The shoreline is irregular with small inlets with mud, clay, and rock banks. The bottom gradient varies from about 5:1 to 2:1 to depths of 20 feet. The bottom substrate is also varied with mud, silt, rocks, and debris found in various combinations.

The varied physical nature of the littoral zone provides spawning areas for most warmwater species. Preferred spawning depths from 2 to 10 feet are available with rock and gravel substrate for smallmouth bass; mud, silt, and debris for largemouth bass, sunfish, and perch. Aquatic vegetation is limited.

Most of the warmwater species are year-round inhabitants of the area, spawning in the spring when the water temperature reaches about 60°F. They are active throughout the summer months, preferring shallow and backwater areas. They are inactive during the winter when they are found in the deeper areas of the river. The Hayden Island area, especially the Oregon Slough, supports a recreational fishery on most of the warmwater game fishes listed above.

No threatened or endangered fish species have been reported from the lower Columbia near Hayden Island.

B. Benthic Organisms

Benthic organism (primarily invertebrate) populations in the substrate of any body of water are important to fish production and are a necessary component of the aquatic ecosystem. The lower Columbia River system supports a variety of benthic organisms, which are a significant food source for both juveniles and adults of many resident and migratory fish species. Quantity and distribution of these organisms in the river is determined to a great extent by type of substrate.

Benthic invertebrates were sampled off Hayden Island in April, May, and July 1984. Appendix C-8 contains a list of organisms found in the substrate at that time and others which have been reported from the lower Columbia. Similar species were found off both sides of the island, with substrate composition affecting the population size at any given area. Dominant organisms in the substrate were amphipods, oligochaetes, and Diptera larvae (ie, Chironomidae, Ceratopogonidae). Other organisms present were Ephemeroptera, Odonata, Nematoda, Polychaeta, Pelecypoda, and lamprey.

Substrate composition of the Oregon Slough and Columbia River adjacent to Hayden Island at various depths is presented in Figure 3.2-VI. Generally, substrate off the north side of the island (channel) consists of sand, pebbles, and cobbles; whereas, the south side surface substrate is mainly silt/mud and detritus near the shore. Small amounts of detritus also occur in the substrate at the western end of the north side.

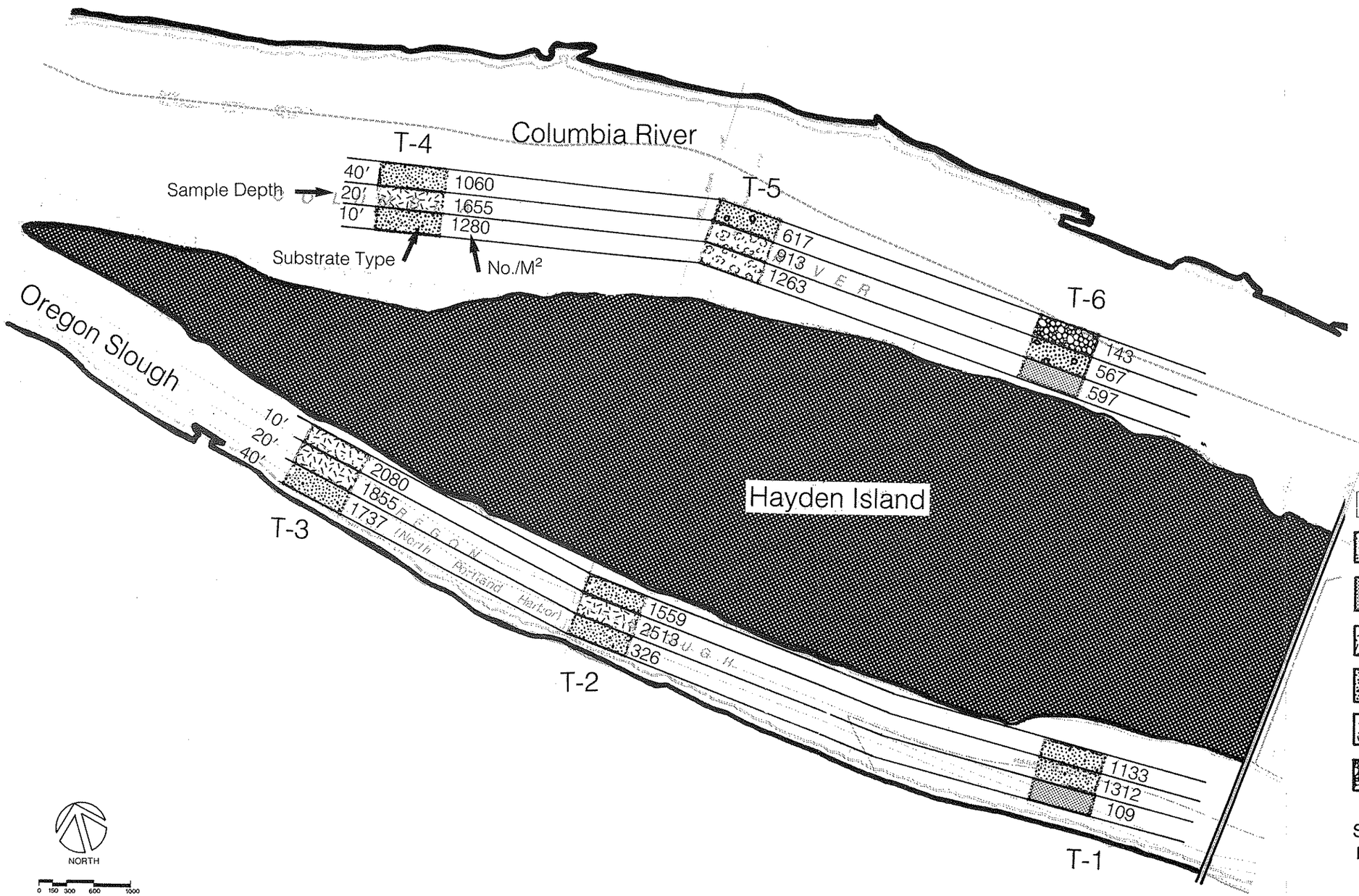
Figure 3.2-VI and Table 3.2-VII show the mean number of organisms present in the substrate (10- to 40-foot depth) during the four-month sampling period. The substrate off the proposed development area (sand, pebbles, and cobbles) supports the least number of organisms (143-597/m^2). Off the south shore and western end of the north shore in the slower-moving water, organisms increase to over 2,000/m^2 due to the more stable and favorable substrate.

Sample numbers are indicative of spring and summer densities of the organisms present in the substrate of waters adjacent to Hayden Island. The major taxa, oligochaeta, amphipoda, chironomidae, and ceratopogonidae, would be found in the substrate year-round, with seasonal trends of abundance. In 1984, peak densities of oligochaeta and ceratopogonidae occurred in the summer and that of chironomidae in the spring. Amphipod densities did not fluctuate significantly.

Portland General Electric

HAYDEN ISLAND

Substrate Composite & Benthic Invertebrates per Square Meter



LEGEND

- Silt, Detritus, Sand
- Silt, Sand
- Silt, Detritus
- Sand, Cobbles, Pebbles, Silt
- Sand, Silt, Pebbles, Detritus
- Sand, Cobbles

Source: Portland General Electric
Environmental Sciences Department

Benkendorf Associates
Ogden Beeman & Associates

Figure 3.2 - VI

PSD006347

Table 3.2-VII

BENTHIC INVERTEBRATES (No./m^2) IN RELATION TO DEPTH
HAYDEN ISLAND, 1984

		South Shore			North Shore		
Transect		1	2	3	4	5	6
Depth	Month						
	April	1530	980	1480	940	2350	430
10'	May	1586	1522	2108	–	750	240
	July	283	2174	2652	1620	690	1120
	April	2173	2820	2020	1850	2100	440
20'	May	1044	3370	2501	–	90	250
	July	718	1348	1043	1460	550	1010
	April	–	–	2540	700	110	0
40'	May	87	391	2108	–	250	260
	July	131	260	564	1420	1490	170

C. Zooplankton

Zooplankton are also an important link in the aquatic food chain and are a major food source for juveniles of many fish species (including salmonids). The zooplankton of the Columbia River (Appendix C-9) are comprised of at least six major taxonomic groups, each of which shows seasonal trends of abundance.

Total densities are generally greatest in late spring and summer and lowest in December, January, and February. Of the Cladocerans, Bosmina and Daphnia are the major species and occur year-round, with peaks in July and August. Asplanchna, Brachionus, and Keratella are the dominant rotifers, occurring mainly from January through July. The Calanoid and Cyclopoid copepods are present year-round.

3.2.4 Threatened or Endangered Species

A review of the West Hayden Island project site by the U.S. Fish and Wildlife Service indicates no listed, proposed, or candidate threatened or endangered species occur on-site (Appendix C-10). The Oregon Rare and Endangered Plant Species Task Force, in an interim report to the Oregon State Land Board (Siddall et al., 1979), lists Riverbank Sagewort (Artemisia lindleyana) as "very rare and endangered in both Oregon and Washington". This species occurs on West Hayden Island primarily east of the project site. More recent distribution data compiled by The Nature Conservancy (Appendix C-2) reveals, however, that many new populations have been discovered and Riverbank Sagewort (also known as Riverbank Wormwood) is more abundant than previously known. This species has consequently been delisted in both Oregon and Washington.

Bald Eagles, a threatened species, winter in small numbers on Sauvie Island (about three miles from the project site). No eagles have been observed on West Hayden Island to date but may occasionally use the area for perching. In view of the industrial activity in the vicinity of the project site and Bald Eagle sensitivity to such activity, West Hayden Island is not an important wintering area for this species.

3.3 Social and Economic Setting

3.3.1 Land Use and Community Characteristics

A. Community Characteristics

Portland is situated at the confluence of the Willamette River and Columbia River, approximately 105 miles upstream from the mouth of the Columbia River. It is the end of the authorized 40-foot shipping channel. It is the largest city in Oregon, with a 1982 population of approximately 368,000. The 1982 population of the Portland-Vancouver metropolitan area was approximately 1,325,000; this includes the populations of Multnomah, Washington, Clackamas, and Yamhill counties in Oregon and Clark County in Washington.

Portland is served by a port with international access as well as a good internal transportation system. Portland International Airport also provides an important transportation link, carrying nearly 4,000,000 passengers and over 50,000 tons of cargo annually; it has an average daily arrival and departure of 285 aircraft by 13 scheduled airlines.

North Portland

West Hayden Island is adjacent to the North Portland community; the major transportation routes to the island pass through the northeast corner of those neighborhoods. Table 3.3-I provides a statistical profile of this area in comparison to the remainder of Portland.

There has been a significant level of improvement in the community over the past 15 years. This has been produced by a combination of factors. One of the most important has been the development of a strong neighborhood association: the North Portland Citizens' Committee. This is an umbrella organization for smaller neighborhood associations in the area. Projects in the North Portland area have included a revitalization of the St. Johns business district, street improvements and paving, and a crime-prevention program. The Portland Development Commission's Community Development Block Grant Program has been used to rehabilitate a significant number of homes in the area.

Table 3.3-I

NORTH PORTLAND DEMOGRAPHICS, LAND, AND ZONING

DEMOGRAPHICS	Portland 1980	North Portland 1980
TOTAL POPULATION	366,383	45,456
Percent of City	100%	12%
AGE		
Medium Age	30.9	29.2
Percent Over 60	20%	20%
Percent Under 18	23%	28%
DENSITY		
Population/Acre	5.3	2.9
Population/Residential Acre	8.3	10.9
HOUSEHOLDS		
Total Households	158,847	17,855
Mean Number of Persons	2.3	2.5
RACE		
White	87%	88%
Black	7%	6%
American Indian, Eskimo/Aleut	1%	1%
Asian and Pacific Islander	3%	2%
Other	2%	2%
EMPLOYMENT		
White Collar	41%	29%
Blue Collar	23%	37%
Other	36%	34%
MEDIAN HOUSEHOLD INCOME	$20,244	$18,099

Table 3.3-I (concl)

NORTH PORTLAND DEMOGRAPHICS, LAND, AND ZONING

LAND	Portland 1982	North Portland 1982
TOTAL ACRES	69,346	15,468
Percent of City	100%	22%
ZONING		
Single Family	42%	17%
Multifamily	6%	5%
Row Housing	3%	0%
Commercial	15%	35%
Mixed Residential/Commercial	13%	5%
Open Space	21%	37%
BUSINESS		
TOTAL BUSINESS LICENSES	24,270	1,646
Percent of City	100%	6%
Manufacturing/Transportation/ Utilities	31%	34%
Retail	23%	26%
Miscellaneous Services	21%	23%
Professional Services	9%	4%
Wholesale	9%	8%
Social Services	7%	4%
NEW COMMERCIAL CONSTRUCTION		
Number of Permits	238	48
Total Value (Thousands)	$124,724	$29,785
Percent of City Total	100%	24%

Source: 1982 Neighborhood Information Profiles, City of Portland, 1982.

B. Surrounding Land Uses (Figure 3.3-II)

West Hayden Island

The land is currently leased for livestock grazing and is used as a holding area for livestock being shipped through the Portland stockyards. The lessee has recently requested permission to construct feedlot facilities to increase the number of cattle held and to make it into a year-round operation.

The south shoreline is leased to Crown Zellerbach to tie up log rafts. There are currently facilities to hold five log rafts.

The north shore has been used by the Corps as an authorized disposal area for channel maintenance dredging from the Columbia River.

Vancouver

The shoreline to the north across the Columbia River is in the City of Vancouver, Washington; it has been developed as a heavy industrial marine-oriented area. There are two major groups of port facilities in the immediate area. Directly across the Columbia River from the property are the main facilities of the Port of Vancouver, USA. These facilities include a large grain export facility as well as other berths for the import and export of general cargo, neo bulks, and dry bulk materials. The Alcoa Alumina Import Wharf is on the Washington shore near RM 103, a mile downstream from West Hayden Island. There are several private industries, including Fort Vancouver Plywood and Boise Cascade.

Rivergate Industrial District

South of the West Hayden Island site is the Port of Portland's Rivergate Industrial District. Development of this area started in the early 1970s. It now contains major public terminal facilities for automobiles, containers, and grain. In addition to the public facilities, south Rivergate is the home of Ash Grove Lime and Cement, Waterway Terminals, and other private industrial and warehouse development.

Table 3.3-I (concl)

NORTH PORTLAND DEMOGRAPHICS, LAND, AND ZONING

LAND	Portland 1982	North Portland 1982
TOTAL ACRES	69,346	15,468
Percent of City	100%	22%
ZONING		
Single Family	42%	17%
Multifamily	6%	5%
Row Housing	3%	0%
Commercial	15%	35%
Mixed Residential/Commercial	13%	5%
Open Space	21%	37%
BUSINESS		
TOTAL BUSINESS LICENSES	24,270	1,646
Percent of City	100%	6%
Manufacturing/Transportation/ Utilities	31%	34%
Retail	23%	26%
Miscellaneous Services	21%	23%
Professional Services	9%	4%
Wholesale	9%	8%
Social Services	7%	4%
NEW COMMERCIAL CONSTRUCTION		
Number of Permits	238	48
Total Value (Thousands)	$124,724	$29,785
Percent of City Total	100%	24%

Source: 1982 Neighborhood Information Profiles, City of Portland, 1982.

B. Surrounding Land Uses (Figure 3.3-II)

West Hayden Island

The land is currently leased for livestock grazing and is used as a holding area for livestock being shipped through the Portland stockyards. The lessee has recently requested permission to construct feedlot facilities to increase the number of cattle held and to make it into a year-round operation.

The south shoreline is leased to Crown Zellerbach to tie up log rafts. There are currently facilities to hold five log rafts.

The north shore has been used by the Corps as an authorized disposal area for channel maintenance dredging from the Columbia River.

Vancouver

The shoreline to the north across the Columbia River is in the City of Vancouver, Washington; it has been developed as a heavy industrial marine-oriented area. There are two major groups of port facilities in the immediate area. Directly across the Columbia River from the property are the main facilities of the Port of Vancouver, USA. These facilities include a large grain export facility as well as other berths for the import and export of general cargo, neo bulks, and dry bulk materials. The Alcoa Alumina Import Wharf is on the Washington shore near RM 103, a mile downstream from West Hayden Island. There are several private industries, including Fort Vancouver Plywood and Boise Cascade.

Rivergate Industrial District

South of the West Hayden Island site is the Port of Portland's Rivergate Industrial District. Development of this area started in the early 1970s. It now contains major public terminal facilities for automobiles, containers, and grain. In addition to the public facilities, south Rivergate is the home of Ash Grove Lime and Cement, Waterway Terminals, and other private industrial and warehouse development.

Portland General Electric

HAYDEN ISLAND

Surrounding Land Use

Vancouver, Washington

Kelley Point Park

Oregon Slough

Alcoa Alumina Import Wharf

Port of Vancouver, USA Terminal 2

Fort Vancouver Plywood

Boise Cascade

Columbia River

Interstate 5 Freeway

Rivergate Industrial District

N. Marine Drive

Hayden Island

Ash Grove Lime and Cement

Bybee Lake

St. John's Landfill

Morrison Oil
Albina Transfer
Pacific Coast Hardwoods
Merit Oil & Refining
Stauffer Chemical Company

Burlington Northern Railroad

Crown Zellerbach Manufacturing Plant

Jantzen Beach Center

Ross Island Sand & Gravel

Portland Stockyards Office
Portland Stockyards

Multnomah County Exposition Facility

Tomahawk Island

Smith Lake

N. Columbia Boulevard

N. Portland Road

Interstate 5

West Delta Park

to Portland International Airport

St. Johns

East Delta Park

N.E. Union Avenue

Burlington Northern Railroad

NORTH

0 150 300 600 1000

Benkendorf Associates
Ogden Beeman & Associates

Figure 3.3-II

PSD006356

Marine Drive/Suttle Road Area

The western area opposite West Hayden Island is a cluster of mixed industrial uses. This is an older industrial area, consisting of such industries as Morrison Oil, a container repair facility, an auto-wrecking facility, Stauffer Chemical Company, an asphalt batch plant, Albina Transfer, Merit Oil & Refining, and Pacific Coast Hardwoods. Several of these users have been in this location for a number of years.

In addition to the industrial uses in this area, there are two houseboat moorages on the south shore of the Oregon Slough near the Burlington Northern Railroad bridge. These uses exist as nonconforming uses in an area zoned M-1 and developed for heavy industrial uses.

At the eastern end of this area and opposite East Hayden Island is a second cluster of users along Marine Drive. The largest is a Crown Zellerbach manufacturing plant. Others include the Portland stockyards, Portland stockyards office building, and the Multnomah County Exposition facility. Also in this area, along the waterfront close to the Interstate 5 freeway, are two boat repair facilities and a Ross Island Sand & Gravel facility.

East Hayden Island

Approximately 360 acres of the eastern portion of the island have been developed for residential, recreation, and commercial and light industrial uses by Hayden Island Incorporated. These uses include a major shopping center, two large motels, light industrial park, a number of condominium projects, a mobile home park, and a major marina development. This community is accessed by the Hayden Island Interchange on Interstate 5. Urban services have either been constructed by the developer or obtained by contracting with other service providers. It is separated from West Hayden Island by the 20-foot berm over which the Burlington Northern Railroad main line passes from Washington to Oregon.

C. Land Use Regulations

Multnomah County and Metropolitan Service District

West Hayden Island is located in unincorporated Multnomah County and the use of the land is regulated by the county's comprehensive plan. The site has previously been approved for marine industrial development uses. The provision for urban services and the adoption of specific development standards are part of the ongoing planning process outlined in the Multnomah County Comprehensive Plan. The site preparation and filling, addressed by the permit application, is the first item required by the county's action. Because the local permit can be more stringent than federal, but cannot

be less so, the first step in this process is to obtain the Corps' permit.

On September 9, 1982, the Multnomah County Board of Commissioners unanimously adopted ordinances designating West Hayden Island as an urban area in the county's comprehensive plan. Additional policies were adopted relating to growth management and the marine transportation system.

The approval of the change was conditioned on Metro amendment of the regional UGB to include West Hayden Island. Metro unanimously approved this action in April 1983. Because this was a major land use change, the Oregon LCDC was required to review the action and determine if it was consistent with state goals, including Goal 5. The commission decided not to hold a hearing and thus approved the action.

In addition to approving the comprehensive plan change, the county action outlines specific conditions which will be used in the future to evaluate and approve the specific implementation of the plan. These conditions are contained in Appendix A. The county ordinance requires a conditional use for the placement of fill. The future development will be subject to the county's significant environmental concern zone, the subdivision ordinance, and design review at the appropriate times.

City of Portland

West Hayden Island is an area to which the City of Portland intends to provide urban services. The city is currently pursuing annexation of its entire urban service area, including Hayden Island. Detailed negotiations are under way between the City and East Hayden Island owners and discussions have been held with West Hayden Island owners. It is anticipated that Portland will be the primary urban services provider and annexation will occur at some time in the future.

Annexation will not change the land use regulations. Special hearings by both the City of Portland Planning Commission and the City Council must be held to adopt any changes. The city generally holds such hearings within about six months of the annexation and converts the land to the city's zone most closely resembling the county's.

3.3.2 Economic Activity

Portland

The Portland area has a well-diversified economy. Roughly one-quarter of the employment base is in trade, much of which uses water transportation via the Columbia River's deep-water access to the Pacific Ocean.

Other major employment is provided by manufacturing, including recent electronics industry development. Portland serves a variety of water-related industries, including dry-dock facilities adequate to serve up to 100,000 tons. Portland's position as one of the major West Coast freshwater ports provides substantial employment in terms of cargo ingress and egress as well as marine service industries.

Waterborne commerce for the Portland area provides high rankings in relation to the West Coast and the country. In 1980, Portland was No. 10 in the United States for the number of annual ship calls. Portland ranked No. 1 in the Pacific Northwest for total volume of ocean commerce, and No. 1 on the West Coast for export tonnage and auto imports. The total tonnage for the Portland area ranked No. 3 on the West Coast.

Impact of Port Facilities

Economic impacts of current port facilities and water-dependent industrial development are significant for the state and the metropolitan region. In 1980, a total economic impact exceeding $1.2 billion was attributed to the activities of the publicly owned Port of Portland. This does not include the effects of the more than 40 private businesses which operate dock facilities in the harbor.

Employment and Income

Port activity generated directly or indirectly over 34,000 jobs statewide; more than one-third were filled by Multnomah County residents. By the year 2000, total economic benefits are expected to exceed $3 billion (1981 dollars) with employment at 76,800. Up to 1,469 of these jobs may result from West Hayden Island development.

The Metro Industrial Lands Market Assessment forecasts an employment range for the Portland metropolitan area between 825,000 to 1,050,000 jobs by the year 2000. Marine industry provides high-quality employment opportunities (average $25,000/year) and has positive secondary effects upon the economy. Issuance of a fill permit would allow the creation of employment opportunities which could not be created on land presently available within the Portland Standard Metropolitan Statistical Area.

Development on West Hayden Island will stimulate Oregon and southwest Washington business and provide a diversification of markets. The improvement of the Portland ports' competitive position with other West Coast maritime facilities would help create employment opportunities throughout the Portland region.

3.3.3 Existing Port and Navigation Facilities

The West Hayden Island site is located on the Columbia River between RM 104 + 1000 feet and RM 105 + 3000 feet, and at Mile 3 on the Oregon Slough. The federally authorized 40-foot navigation channel ends at RM 105 + 3000 feet and the entire site faces on the lower Vancouver turning basin, which varies from 600 to 800 feet in width. The

federally maintained channel and turning basin are on the Washington side of the river; a distance of 1,000-5,000 feet separates the northerly shore of the subject property from the southerly limits of the turning basin.

A federal navigation project of 40 feet x 400 feet terminates at the downstream end of the property at Mile 1 + 3000 feet on the Oregon Slough. A federal channel of 20 feet x 200 feet proceeds along the south shore of the project, terminating at Mile 3.8, upstream of the subject property.

A. Government Investment

Governments at all levels have invested substantial amounts of money in the marine transportation system associated with the lower- and mid-Columbia River to support an increase of foreign and domestic trade. The federal government has created and maintained a 40-foot channel from Portland to the Pacific Ocean and the upriver channel to Lewiston, Idaho, as well as the locks on the various upriver dams in the Columbia River. The Corps has completed deepening the mouth of the Columbia River and is moving forward with the construction of a new lock at Bonneville Dam in accordance with congressional approval. The local port authorities have invested hundreds of millions of dollars in landside facilities to increase trade. This system supports thousands of businesses and tens of thousands of jobs in the Northwest and Midwest regions of the country.

B. Private Sector

Moorage and dock facilities for 40 water-dependent private manufacturers and distributors of primary and fabricated metals, petroleum, chemicals, grain, wood and paper products, and aggregate minerals are available in the Portland harbor (Figure 3.3-III and Table 3.3-IV). These companies operate 41 ship berths in the harbor. Their payroll, taxes, and other expenditures make a significant contribution to the area's economic base. In addition to shipping and receiving foreign goods, many of these firms also manufacture products for the domestic market. Ross Island Sand & Gravel and Willamette High Grade Concrete provide products necessary to the growth of the local area, while others (eg, Marine Ways and FMC Corporation) build ships, barges, and other marine-oriented equipment. Towboat companies serve other harbor users.

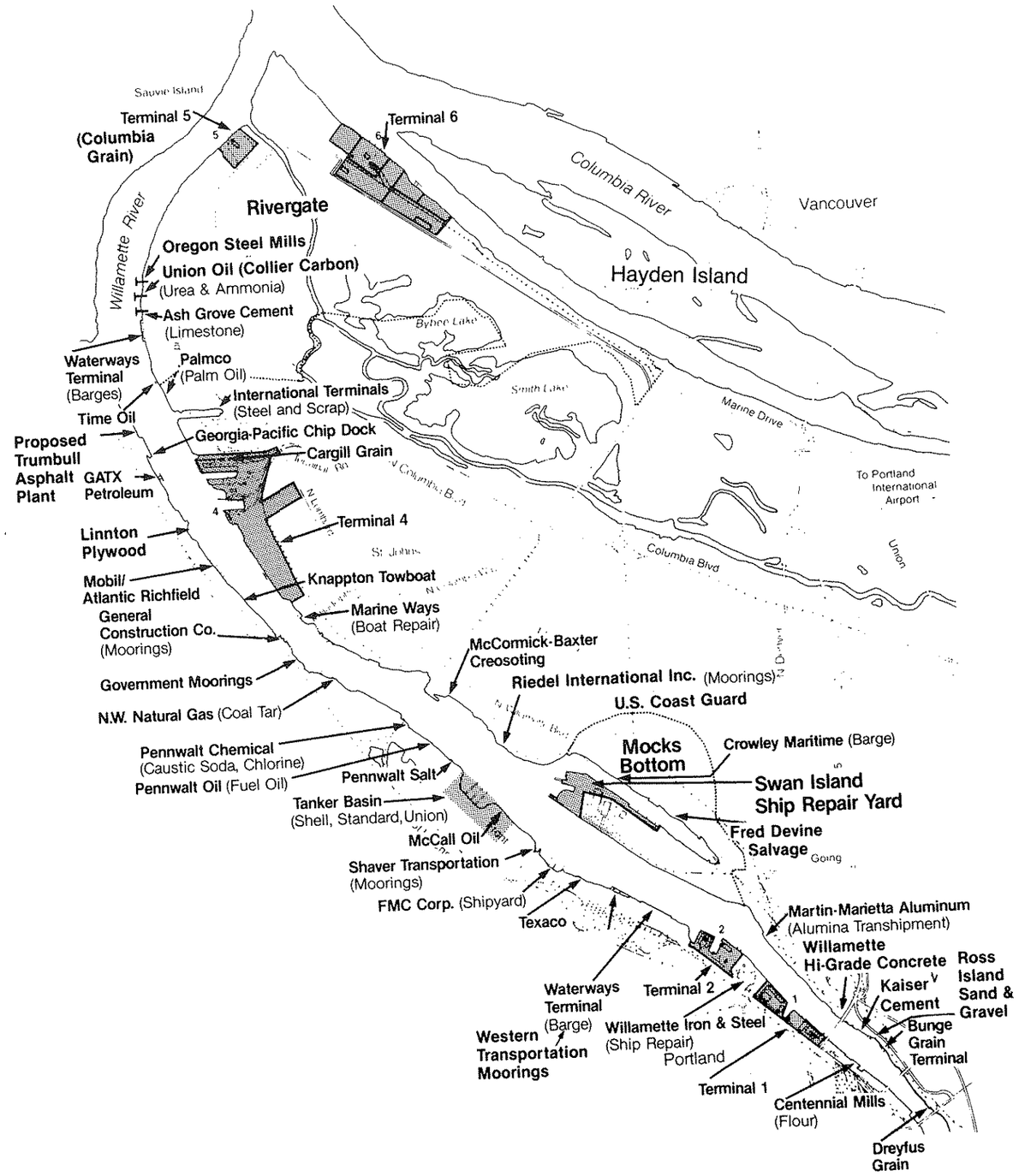
C. Port of Portland

The Port of Portland is responsible for marine, aeronautic, and general industrial development within the three metropolitan-area counties. It owns and operates five public marine cargo terminals and a ship repair yard in the harbor. The agency also owns and manages large portions of

Portland General Electric

HAYDEN ISLAND

Portland Harbor



LEGEND

Port of Portland Facilities

Source: Port of Portland

Benkendorf Associates
Ogden Beeman & Associates

Figure 3.3-III
III - 38

PSD006361

Table 3.3-IV

MAJOR PRIVATE WATERFRONT INDUSTRIES IN PORTLAND HARBOR

Firm	Principal Activity/Commodity
Ash Grove Cement	Quicklime/hydrated lime
Bunge Grain	Storage and shipment/grain
Cargill Grain*	Storage and shipment/grain
Centennial Mills	Flour
Collier Chemical Company (subsidiary of Union Oil)	Urea; ammonia
Columbia Grain*	Storage and shipment/grain
Crowley Maritime	Barge moorings
Dreyfus Grain	Storage and shipment/grain
FMC Corporation	Shipyard/railcars
Fred Devine Salvage	Ship salvage
GATX Petroleum	Receiving dock/oil
General Construction Company	Moorings
Georgia-Pacific	Wood chips
International Terminals	Steel and scrap
Kaiser Cement	Cement
Knappton Towboat	Transportation
Linnton Plywood	Plywood
Marine Ways	Boat repair
Martin Marietta Aluminum	Shipment/aluminum
McCall Oil	Receiving dock/oil
McCormick-Baxter Creosoting	Creosote
Mobil/Atlantic Richfield	Receiving dock/oil
Northwest Natural Gas	Coal tar
Oregon Steel Mills	Fabricated steel
Palmco	Palm oil
Pennwalt Chemical	Caustic soda, chlorine
Pennwalt Oil	Fuel oil
Pennwalt Salt	Salt
Reidel International, Inc.	Moorings
Ross Island Sand & Gravel	Sand and gravel
Shaver Transportation	Moorings
Shell Oil	Tanker dock/oil
Standard Oil	Tanker dock/oil
Texaco Oil	Receiving dock/oil
Time Oil	Receiving dock/oil
Union Oil	Tanker dock/oil
Waterways Terminal (2 sites)	Barge moorings
Western Transportation	Barge moorings
Willamette High Grade Concrete	Concrete
Willamette Iron and Steel	Ship repair

* Cargill and Columbia Grain are located at Terminals 4 and 5, respectively, of the Port of Portland. The land and facilities are Port of Portland facilities which are leased to private operators on a long-term basis.

Source: Port of Portland.

the Rivergate Industrial District in North Portland, which includes three large-scale container berths and one auto import berth with backup land for automobile storage.

The Port has two major marine projects under way which will increase the activity in the Portland harbor. The first is the rehabilitation of the northern half of Terminal 2. The citizens of the tri-county port district approved a $40 million general obligation bond for this project in May 1984. When completed in 1987, this facility will offer a modern, multipurpose terminal that will accommodate containers, ro-ro, pass/pass, break bulk, and neo-bulk vessels with two modern ship berths, 18 acres of paved storage, a new crane, and other cargo-handling facilities.

The Port is also undertaking a master plan study to expand its Terminal 6 container facilities.

According to Port data, more than 350 commodities are imported and exported through Port facilities by more than 4,000 local firms; 90 percent of these are small companies which ship less than 1,000 tons annually. In 1980, the Port's marine terminals generated approximately $500 million in primary economic impacts. If the secondary and tertiary impacts are included, the total economic benefits are estimated to exceed $1.2 billion. More than 34 percent of this amount is retained in Multnomah County.

D. Port of Vancouver

The Port of Vancouver owns and operates a variety of facilities, as well as leasing land to private facilities. Products which are imported through the Port of Vancouver include alumina ore (by Alcoa), dry and liquid bulks, iron and steel, wood products, and automobiles. Exports include grain, dry and liquid bulks, aluminum, wood products, and containerized malt. The Port of Vancouver is looking toward modernizing its existing facilities and in the long-term toward expanding by constructing new facilities on a downriver site.

3.3.4 Land Transportation

Two primary ground transportation elements are considered essential to effective marine industrial development of West Hayden Island: rail service and truck and automobile access. Transit service may be desirable to maintain the functional capability of the truck and auto system.

A. Rail Access

Three transcontinental railroad lines serve the lower Columbia River in the Portland-Vancouver area: Burlington Northern, Union Pacific, and Southern Pacific.

A double-track main line of the Burlington Northern Railroad traverses the eastern edge of West Hayden Island. It is financially feasible to construct a major spur to extend rail facilities along the full length of this property, including construction of a loop track system for unit trains for bulk commodities on individual sites. Space is available for switching yards as needed. Competitive rail service from the Burlington Northern and Union Pacific railroads is available.

B. Highway Access

Regional and local roadway systems serving the island are shown in Figure 3.3-V. Major interstate routes include Interstate 5 (north-south), Interstate 84 (east), and U.S. Highway 26 (east-west). Interstates 205 and 405 provide beltline routes around the metropolitan area.

The existing private road and narrow railroad underspan which provide access between the east and west end of Hayden Island are currently a significant constraint to urban development. The Multnomah County land use approvals for West Hayden Island require the construction of a new bridge across the Oregon Slough to connect West Hayden Island with Marine Drive and North Portland Road.

The eastern portion of Hayden Island is served by Tri-Met. Service could be extended to the western portion when sufficient development occurs. The transportation management program required by the Multnomah County land use approvals will examine and implement improved transit facilities and services as necessary to assure a well-balanced system.

C. Proposed Transportation Modifications

Interstate 5

The Oregon Slough Bridge Project, which includes widening the bridge to four lanes in each direction, is under construction by the Oregon State Highway Division and will be completed by 1987. Improvements to the Marine Drive interchange are not scheduled until after the bridge is completed. The state also plans to restripe Interstate 5 to six lanes in the vicinity of the Portland Boulevard interchange.

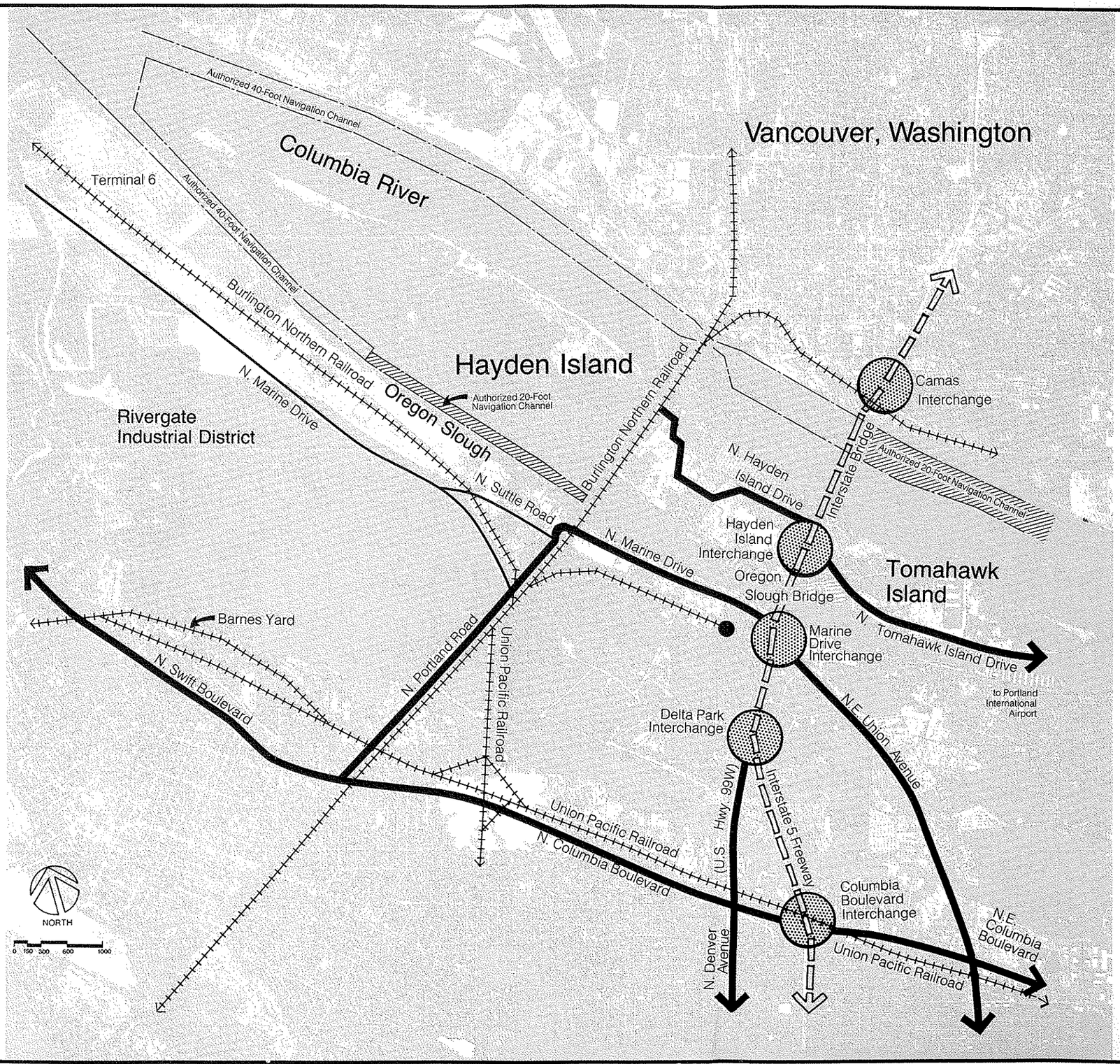
Interstate 205

When Interstate 205 was opened to traffic in 1983, traffic volumes on Interstate 5 and over the Interstate 5 Bridge decreased. However, it is expected that traffic will approach the former volume in the future. Although the effect of Interstate 205 on Interstate 5 truck traffic is not known, it is probable that some trucks traveling nonstop through Portland will avoid Interstate 5 during peak hours of traffic congestion by using Interstate 205.

Portland General Electric

HAYDEN ISLAND

Regional Access



Benkendorf Associates
Ogden Beeman & Associates

Figure 3.3-V

Marine Drive

In a recent analysis of access to the Rivergate Industrial District, the Port of Portland anticipates that Marine Drive and North Portland Road will be adequate until about 1987. The City of Portland is currently developing an environmental impact statement for Marine Drive improvements between Rivergate and the I-5 freeway. The alternatives are being designed to include a bridge from West Hayden Island to the Oregon mainland. It is anticipated that the document will be completed in 1987.

Columbia Boulevard

Traffic signals along Columbia Boulevard are scheduled to be installed by the City of Portland to provide access to and from the roadway and control speed. The city also is developing methods to reduce the impact of industrial traffic on nearby residential neighborhoods. A proposal to provide a left-turn lane from eastbound Columbia Boulevard to North Portland Road is intended to encourage industrial traffic to use Columbia Boulevard.

North Portland Road

This street links Columbia Boulevard with Marine Drive and the entrance to the north Rivergate Industrial District. No capital improvements are planned at the present time.

D. Regional Traffic Forecasts

In 1982, Metro forecast year 2000 afternoon peak-hour traffic volumes for the major roadways in a recommended transportation system and committed system for the region. At that time, West Hayden Island was outside of the regional UGB, and it was not forecast to generate any traffic. An independent traffic study and a traffic management study were completed as part of the land-use action. That study showed that with programmed traffic improvements, a new bridge, and a traffic management program, the system could handle the traffic generated by the development of West Hayden Island.

Metro recently updated the forecast to the year 2005. West Hayden Island was included, but the model was not tested for full development of the island.

3.3.5 Utilities

While there are few urban services and facilities on the western part of the island, a full complement is available on the eastern portion. These have been developed by Hayden Island, Inc. through contracts with Multnomah County, the City of Portland, private entities, and special service districts. Multnomah County regulations ensure that no development of West Hayden Island would occur without proper services.

The alternative methods available to provide such services would be to (a) develop independent systems similar to those servicing East Hayden Island, (b) connect into and expand East Hayden Island facilities, or (c) annex and receive services from the City of Portland. Discussions are currently under way with the City of Portland concerning the provision of services should the island be annexed to the city.

Electrical service to East Hayden Island is provided by PGE from a substation on the western portion of the island. Electrical service to West Hayden Island would be available by extension of transmission lines from the substation. Northwest Natural Gas Company supplies gas to East Hayden Island through a pipeline under the Oregon Slough Bridge. Such a line could be extended to West Hayden Island. Telephone service can be provided by Pacific Northwest Bell through a line extension from East Hayden Island.

Water for fire protection and other uses on East Hayden Island is supplied from two wells. The water-bearing characteristics of West Hayden Island suggest that adequate well water is available in the area.

East Hayden Island has its own sewage treatment facilities, and storm sewer runoff is discharged directly into the Columbia River. West Hayden Island could either expand and use treatment facilities existing on the eastern portion of the island or could construct similar facilities or connect to sanitary sewer lines in Portland upon annexation.

Existing public facilities and services within the vicinity of Hayden Island are illustrated in Figure 3.3-VI.

Submarine cable and pipeline areas are identified in the vicinity of the railroad bridge. No work will be accomplished within 600 feet of the bridge on the Columbia River and within 1,200 feet on the Oregon Slough to assure no impact or conflict due to the proposed dredging.

The City of Portland main sewer outfall from the Columbia Boulevard treatment plant passes across the east end of the project, and special care must be taken both during filling and construction to protect this facility.

The BPA and Pacific Power & Light Company electric transmission lines crossing the west end of the project area will need to be protected, especially the base of the towers and the minimum clearance to the lines.

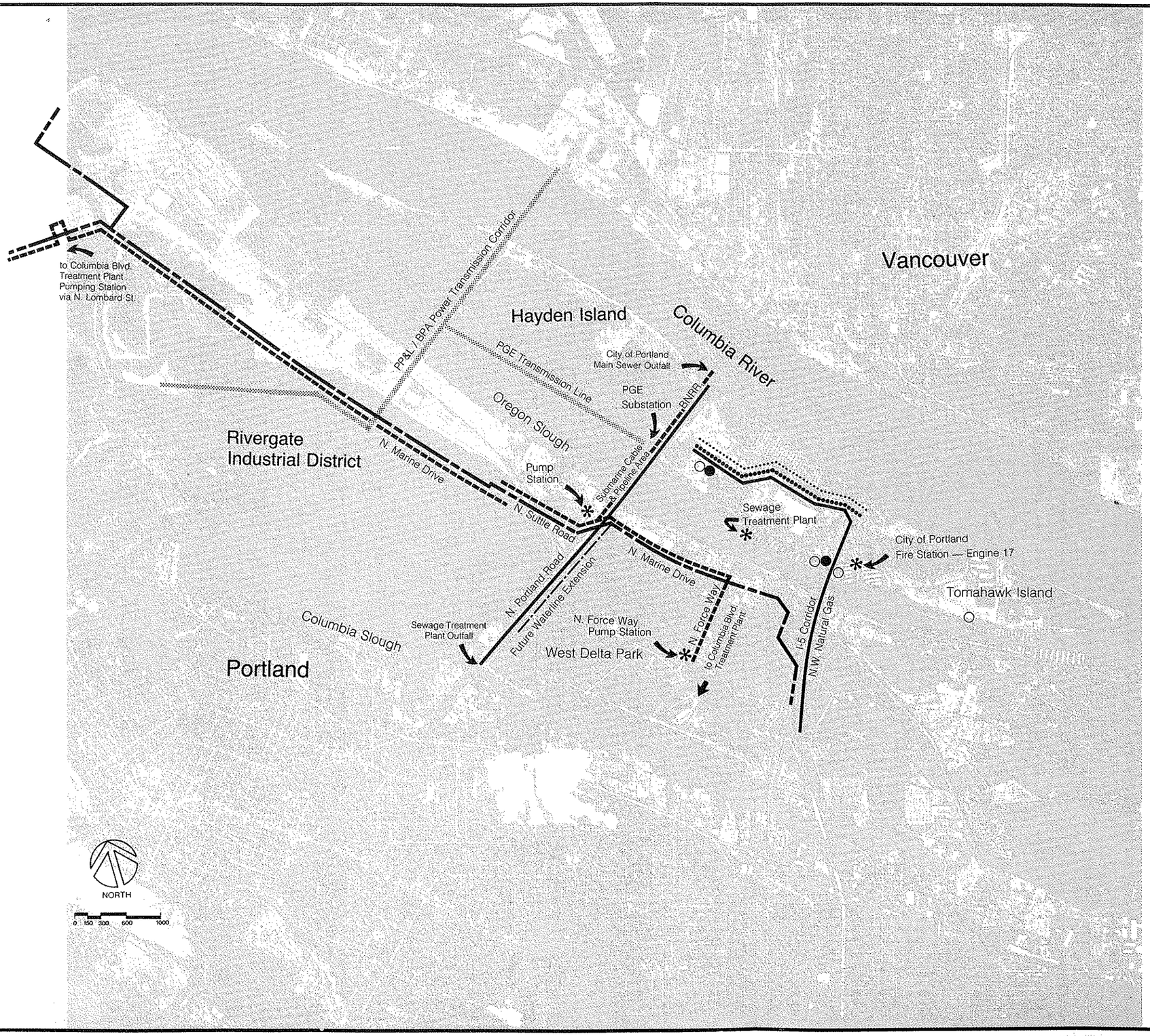
3.3.6 Aesthetics

West Hayden Island is undeveloped property surrounded by urban development. Ships frequently anchor off the north shore, which faces a variety of Vancouver industries. The south shore of the island similarly faces existing marine industrial development. The Rivergate Industrial District with Terminal 6 and two port sites designed for future development will have a view of the West Hayden Island marine industrial development.

Portland General Electric

HAYDEN ISLAND

Existing Public Utilities and Services



LEGEND

City of Portland

- Water
- Sewer

Hayden Island, Inc.

- Well
- Water Reservoir
- Water
- Sewer

Benkendorf Associates
Ogden Beeman & Associates

Figure 3.3-VI

PSD006368

Approximately 50 percent of the island itself is covered with cottonwood/ash woodland. On the north shore, the dredge spoils have created a sandy beach with the tree cover set back 200-400 feet. On the south shore, the trees are up to the water's edge. There is a 5- to 10-foot drop from the island into the water along the south shore.

The existing view from the water for both commercial and recreational water traffic is heavy marine industrial development on both the Oregon and Washington shores and a natural landscape on Hayden Island. West Hayden Island creates a visual break between the two shorelines. The users most significantly affected by development are the houseboat moorages on the Oregon shore in the Suttle Road industrial area.

The trees on the island are also visible in the background from East Hayden Island and from the Interstate 5 Bridge. This view is primarily treetops over the top of commercial and industrial development.

3.3.7 Noise

Ambient sound level measurements were conducted on West Hayden Island to characterize the existing noise environment. These data provide a baseline for measurement of noise levels produced by future development. Measurement locations utilized for this testing are illustrated on Figure 3.3-VII. Measurement results and a review of Oregon and Washington noise regulations are in Appendix D-6.

The measured ambient sound levels for both daytime and nighttime were produced by a variety of industrial facilities on both the Washington and Oregon sides of the Columbia River. The Port of Portland's Terminal 6 is a major contributor to the overall sound level. On the Washington shoreline, port activities, including a grain elevator and several dock facilities, produce most of the ambient sounds measured on the north side of Hayden Island. Burlington Northern Railroad tracks have a significant effect on Hayden Island sound characteristics. These railroad tracks provide north/south access for the Burlington Northern, Union Pacific, and Amtrak railroads. Trains pass through this area at regular intervals during the day and night.

Sound levels are intermittently increased by the approach and takeoff of commercial airliners at PIA. Hayden Island lies directly below the primary corridors for air traffic in and out of the airport. Aside from the train passage and airplane noises, the ambient noise on Hayden Island could be best described as a continuous industrial noise. Very little of the noise can be directly attributed to a single source.

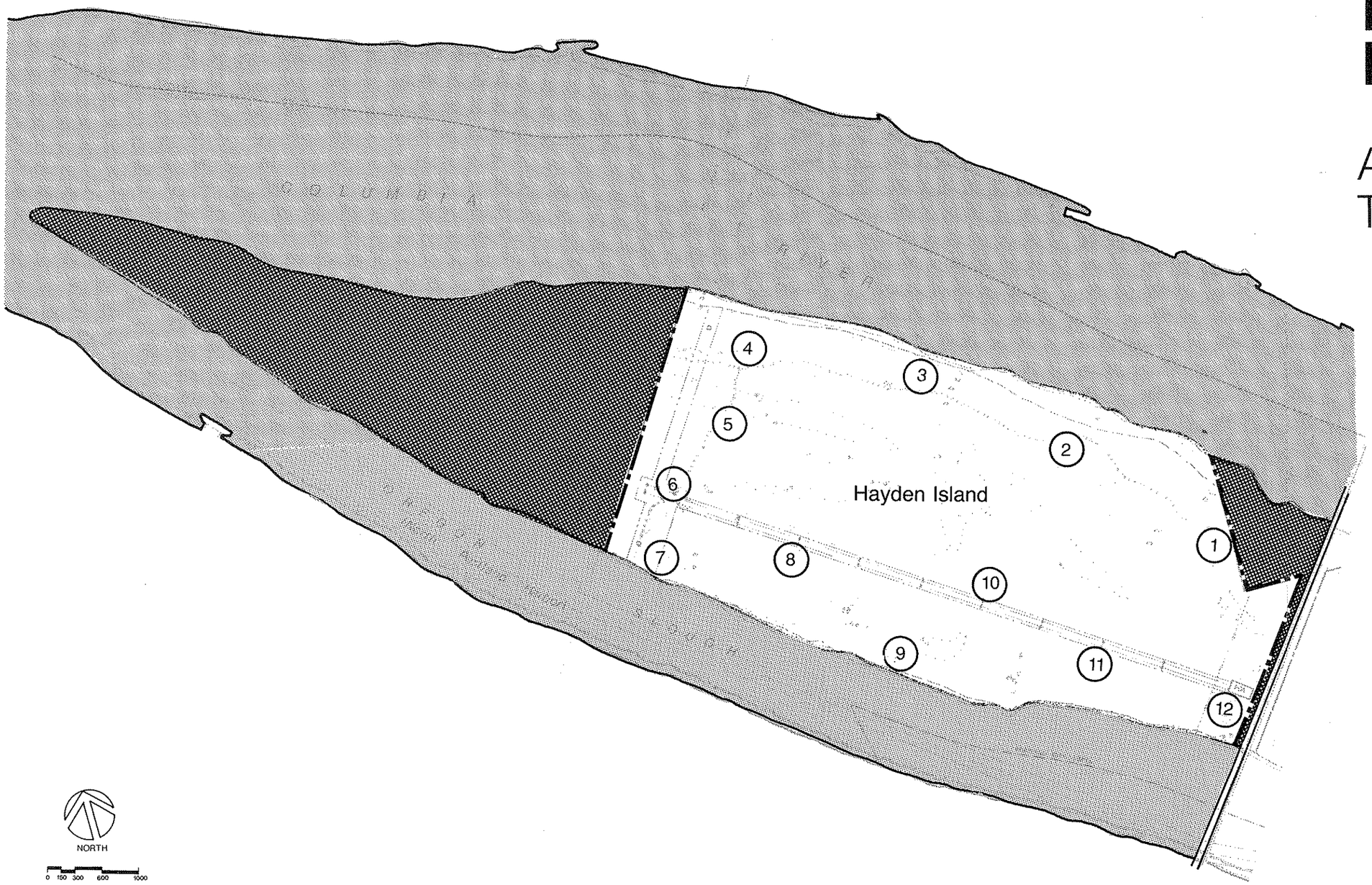
3.3.8 Recreation

PGE's property on West Hayden Island is secured by a locked gate to protect the livestock and is not accessible to the public for recreational use. Recreational boaters occasionally use the beaches for picnicking. The property is not otherwise available for outdoor recreation.

Portland General Electric

HAYDEN ISLAND

Ambient Test Locations



Benkendorf Associates
Ogden Beeman & Associates

Figure 3.3-VII

PSD006370

A significant need for recreational land in Multnomah County, particularly water-related sites, has been identified by the State of Oregon. Other sites, such as Smith/Bybee lakes, the Columbia River shoreline from Northeast 33rd to the Sandy River, Oaks Bottom, Blue Lake Park, Ross Island, and Vancouver Lake can meet these needs. No public jurisdiction has indicated an interest in acquiring West Hayden Island properties from the private owners.

No wilderness areas, historic sites, or cultural sites have been identified. There are no potential state recreation trails or federal and state scenic waterways on the property.

According to the Portland Metropolitan Area Waterways Development Plan (November 1980), there is a:

> . . . need to protect commercial shipping facilities in the upper reaches of this river zone (essentially the area between I-5 and the mouth of the Willamette, including terminals and the deep-draft anchorage area) from incompatible uses. Throughout the reach, channel navigation by both ships and tows must also be protected. A combination of effective marine law enforcement and an effective boater education program will allow continued safe operation of both commercial and recreational craft. There are few opportunities for development of boating facilities . . .

The report encourages the City of Portland to adopt provisions:

> . . . which disallow any further development of recreational boating access facilities (launching ramps and moorages) in the commercial harbor between the Steel Bridge and the mouth of the Willamette River and between the mouth of the Willamette and the railroad bridge over the Oregon Slough (North Portland Harbor).

Existing recreational use of this section of the river will continue; however, it has not been identified as a portion of the Portland metropolitan-area waterways which should be further developed or enhanced.

3.3.9 Cultural Resources

A cultural resources evaluation was made of the project site by David V. Ellis of Willamette Associates, and a detailed report was published in March 1986. The following is quoted from the executive summary of the report:

> The existing area environment is one of ash - cottonwood woodlands on higher ground and natural grasslands and pasture in old sloughs and on artificial land. This reflects the picture of the island as recorded in the early nineteenth century - a mosaic of woodlands, meadows, and old channels with ponds and marshes. The native resources in

the area include a variety of small and large game, waterfowl, and abundant runs of fish in the Columbia. Since the early twentieth century, the island's form has been substantially modified by the construction of spur dikes, dredged spoils, and human efforts to change the adjacent channels.

Archeological research has indicated human settlement in the Portland Basin extends back in time at least 3,000 years and possibly 6,000-9,000 years. The islands of the Columbia were important centers of settlement, but there is no known evidence for prehistoric settlement on Hayden Island. The ethnohistoric data depicts the island area as the home of an affluent Chinookan culture; however, this information also provides only a brief reference to native use of Hayden Island: that reference is to an outside group in the final years of the aboriginal era. An 1850's farmstead was the first Euro-American settlement of Hayden Island. This farm was short-lived, and the project area soon developed its present use - as a holding area for livestock being marketed in Portland.

The field study of the project site recorded no significant evidence of either prehistoric or historic occupation. It is likely that there was limited native use of the island, producing little archeological data. There was no evidence of the Hayden farmstead, although its site is in the project area. The historical record has been lost to later development, especially dredged disposal. It is concluded that no significant cultural resources would be affected by the proposed development. No further work is recommended at this time.

The state historic preservation office has reviewed the report and submitted the following comment:

"We feel that no cultural resources of national register potential have been identified which are likely to be impacted by this project. We therefore feel that Public Law 89-665 and Executive Order 11593 have been complied with and the project may go forward as planned."

4.0 Environmental Effects of Alternatives

4.0 ENVIRONMENTAL EFFECTS OF ALTERNATIVES

4.1 Physical Environment

4.1.1 Geology, Soils, Topography

Geology and Soils

Alternative A

The subsurface geology and subsurface soils will remain intact except in the excavated basin area (Alternatives A and B). Sandy material dredged from the river and from the project site itself will be placed over the top of existing soils. The fill will vary in depth from 4 feet to 20 feet. Because of their composition, the dredged materials will have a limited ability to support vegetation.

A 64.4-acre basin will be created in the southeast quadrant of the project site to a depth of -45 feet CRD. Recent soil tests at this location indicate that sandy material extends to a depth of at least -60 feet CRD.

Alternative B

A smaller or shallower basin would be created, and 132.3 acres of land around the basin would be left unchanged.

Alternative C

Under Alternative C the north shore would be filled and approximately 194 acres of the south side would be left unchanged.

No Action

The soils would be unchanged.

Topography

Alternative A

Nearly all the project site would be covered with fill material. A 64.4-acre basin in the southeast corner of the site would be excavated to provide a source of fill. A perimeter levee would be constructed and the interior areas filled to a minimum elevation of +24 feet NGVD.

No filling or dredging would occur between elevation -20 feet CRD and +10 feet NGVD.

Alternative B

This development plan features a 40-acre basin in the southeastern portion of the project site. An estimated 132.3 acres

surrounding the basin would not be developed and would remain in its present condition. The remainder of the site would be filled to a minimum of +24 feet NGVD with a perimeter levee.

Alternative C

About 194 acres along the Oregon Slough would stay in a natural condition. The remaining area would feature a perimeter levee with the interior filled to a minimum elevation of +24 feet NGVD.

No Action.

The soils would remain unchanged.

Fill Material Sources

Alternative A

The dredged material would come from the north access channel, the turning basin, and the Oregon Slough, which would provide approximately 2 mcy of fill material. The excavated 64.4-acre basin in the southeast quadrant of the island would provide 6.5 mcy of fill material.

Alternative B

This plan would have the same impact as Alternative A except it would require only 4 mcy from the basin.

Alternative C

Alternative C would require a total of 6.5 mcy of material. There are 2 mcy available from the river. There is no known source for the remaining 4.5 mcy required.

No Action.

If this permit request is denied, the site will remain in its present land configuration. In the long-term, conditions could be changed by the continued use of the site for disposal of dredged material, and the south shoreline will continue to be impacted by erosion from the river.

4.1.2 Floodplain Loss

Alternatives A, B, and C

The applicant has completed a hydraulic model analysis of the proposed action. Utilizing the HEC-2 model and previous floodplain studies for this area, it was determined the fill on Hayden Island will not significantly increase flood heights in the area. The base flood water surface was computed with and without the proposed fill. The increased water elevation because of the fill would comply with Federal Emergency Management Agency criteria.

No Action

If this permit request is denied, the site will not be filled as proposed in the development plan. However, portions of the site may continue to be used as disposal areas for material dredged from the Columbia River navigation channel.

4.1.3 Water and Sediment Quality

Alternative A

Short-term turbidities, reduced oxygen near the dredge head, and downstream deposition of resuspended bottom sediments would be expected during the dredging process in the Columbia River. No expected changes would occur to water temperatures from dredging activities. The dredged material would be disposed of on the project site.

During basin excavation parallel to the shoreline, a berm or dike would be maintained. Keeping the shoreline intact to the end of the process would reduce and contain the turbid waters as runoff from fill placement occurs on-site. The shoreline between the basin and the Oregon Slough would then be removed and dredged to a depth of up to -45 feet CRD. While this is in progress, there would be a short-term degradation of water quality from turbidity, suspended solids, and some reduced dissolved oxygen near the dredge head as bottom sediments are resuspended.

Dredged material from the Columbia River would contain primarily fine- to coarse-grain sand (Dames and Moore, 1985). Because sand has a low affinity for accumulating trace metals, concentrations sufficient enough to cause adverse impacts are not expected. Sediment samples collected in the Oregon Slough will be analyzed for particle size to determine settling requirements of the finer constituents, including silt and clay.

During disposal of dredged materials on land, temporary berms, dikes, or other containments would be constructed to allow for settling of suspended particles. This would preclude direct runoff of any turbid waters into the Columbia River or the Oregon Slough. However, some short-term slight degradation of along-shore water would likely occur.

The long-term maintenance of the navigation channels along the north and south shores of the project will have the same effects on water quality as those addressed in maintaining existing navigational channels (Corps, 1975[a, b]).

Throughout the general Portland harbor and the port areas of Vancouver and Portland, there exist many paved parking areas and rooftops which drain into the Columbia River with and without containment systems. At present there are no site-specific regulatory requirements for these nonpoint sources from urbanization and industrialization, as long as erosion is not occurring (Oregon Administrative Rule 340-41-026). Oil

spills are regulated by the EPA (40 CFR 110, 112) and the U.S. Coast Guard (33 CFR 145-157). The Oregon DEQ does not require waste treatment for storm runoff. If specific industries which operate on the developed properties store hazardous wastes or have wastewater discharges, these would be regulated by the Oregon DEQ on a case-by-case basis.

Alternative B

Environmental effects would be decreased in that only a 40-acre basin is required to provide fill for the project site.

Alternative C

Water quality impacts would be limited to the Columbia River dredging of the access channel and turning basin. The south side property would not be developed.

No Action

There would be no major changes in existing conditions. Routine along-shore dredging to maintain existing navigational channels would continue. Short-term water quality degradation during dredging would occur. Some additional fill material may be placed on West Hayden Island at established dredged material disposal sites. If West Hayden Island is used for disposal, some short-term runoff from dredged materials may occur, which adversely impacts water quality of the Columbia during the deposition process. Increased turbidity and suspended materials would cause these short-term water quality problems.

4.1.4 Air Quality

Alternatives A, B, and C

The proposed development plans address future land use changes on West Hayden Island and do not directly address new construction of air contaminant emission sources. New industries would be attracted based on the development plan and would provide potential for new emission source growth. The types of new sources would be limited to marine industrial activity.

Because no new emission sources are specifically identified within the proposed plans, it is not possible to determine future air quality effects. A review of federal and Oregon state air quality regulations was performed to reveal possible compliance requirements for new sources on West Hayden Island. The results of the review indicate that new source growth is possible, but potential sources must comply with the regulations presented in Appendix B-2. This review is presented in Appendix B-3.

No Action

No change to air quality would occur if the proposed development is not implemented.

4.2 Biological Environment

4.2.1 Terrestrial Species and Habitat

A. Vegetation

Alternative A

The proposed marine industrial development alternative would result in the loss of 488 acres of vegetation (Table 4.2-I). Alternative A maximizes the use of the project site for development (7.9 acres undeveloped). Alternative A would require some form of off-site mitigation to compensate for habitat value losses.

Removal of vegetation and filling the project area would occur over a 10- to 20-year period in four development phases. The first phase would occur in the north and eastern areas of the project site. These areas consist of primarily dredged material and meadow habitat which have relatively low wildlife use. Habitat value impacts in relation to wildlife are discussed in Section 4.2.1(C).

Alternative B

Approximately 132 acres surrounding a 40-acre excavated basin would remain in a natural condition. Removal of vegetation and filling the project area would occur in three development phases. The first phase, as in Alternative A, would occur in the north and eastern areas of the project site.

Alternative C

Only the northern portion of the project site (302 acres) would be subject to clearing and filling. Two development phases are proposed, beginning with the northeastern portion of the site.

No Action

The project site will likely be subject to increased livestock grazing. To improve the capacity for grazing, approximately 150 acres of cottonwood/ash habitat would be removed and converted to pasture or meadow habitat.

B. Wildlife

Alternative A

Wildlife would be directly affected by the loss of habitat resulting from marine industrial development. Nearly all

Table 4.2-I

ESTIMATE OF HABITAT (ACRES) DEVELOPED AND REMAINING
UNDER THE THREE MARINE INDUSTRIAL DEVELOPMENT ALTERNATIVES

	Development Alternative					
	A		B		C	
Habitat Type (Acres)	Developed	Remaining	Developed	Remaining	Developed	Remaining
Wooded Wetland (32)	29	3	24	8	3	29
Herbaceous Wetland (48)	48	0	43	5	43	5
Meadow (95)	95	0	60	35	52	43
Cottonwood/Ash (228)	227	1	148	80	114	114
Dredge Material (77)	73	4	73	4	74	3
Beach (16)	16	0	16	0	16	0
Total (496)	488	8	364	132	302	194

habitat would be removed by the implementation of Alternative A. The area would no longer be available to most wildlife species currently on-site. The plan would require off-site mitigation.

Wildlife in undeveloped areas west (232 acres) and east (18 acres) of the project site may also be indirectly affected by the proposed development. Wildlife species with relatively large home ranges would be most affected by reduced habitat. Although required habitat constituents are present for many species, smaller isolated areas are often not used by wildlife as much as a larger area of the same habitat.

A marine industrial development on West Hayden Island would reduce the acreage of habitat for Great Blue Herons in the region and thus may affect the success of the nearby rookery and preclude extension of the rookery to West Hayden Island. In view of the number of natural areas in the immediate vicinity (eg, West Delta park, Smith/Bybee lakes, Sauvie Island, and Vancouver Lake), this may be considered a minor impact. However, results of the HEP process indicate a relatively high value of the site to this species (ie, HSI = 0.88).

Alternative B

Habitat losses are less extensive (132 acres undeveloped) than in Alternative A; however, wildlife residing in the remaining habitat may be affected by human activity in adjacent developed areas.

Alternative C

Habitat losses are less extensive (194 acres undeveloped) than in Alternatives A and B; however, wildlife residing in the remaining habitat may be affected by human activity in adjacent developed areas.

No Action

The removal of approximately 150 acres of cottonwood/ash habitat for increased grazing capacity would result in negative impacts to species dependent on this wooded habitat (eg, Northern Oriole, Townsend's Chipmunk). However, the expanded meadow areas would benefit small mammal species such as the Townsend's Vole and improve the feeding opportunities for the Red-tailed Hawk.

C. Habitat Impact Analysis

Results of the habitat evaluation study conducted on the project site in 1985 can be used to determine the impact of

the three proposed development alternatives. No action habitat conditions (ie, grazing) are compared to predicted future habitat conditions at predetermined target years. Target Year 0 represents baseline conditions; Target Year 1 represents the first year land use is expected to change; and other target years are selected up to the completion of the proposed action or the end of the economic life of the action. The economic life of the proposed marine industrial development on West Hayden Island is assumed to be 40 years for analysis purposes.

Using the same HSI models, the area of available habitat and HSIs is estimated for each evaluation species, and future target year HUs are determined for each target year and annualized by summing the HUs throughout the analysis period and dividing by the number of years in that period (ie, 40 years). This results in Average Annual Habitat Units (AAHU). Annualization of HUs facilitates the comparison of the three alternative actions for impact assessment.

Table 4.2-II depicts the net changes in AAHUs, comparing the three marine industrial alternatives with the no action (ie, grazing) alternative for West Hayden Island. The degree of adverse effects on habitat and its associated wildlife is a function of the amount of land developed. As a consequence, Alternative A would have the greatest net negative impact to all evaluation species, whereas Alternative C would result in net losses of AAHUs for only 6 of the 10 evaluation species.

Small differences in impacts to Great Blue Herons exist between the development alternatives. Although 143 acres of cottonwood/ash and wooded wetland remain undeveloped in Alternative C, for example, human disturbance adjacent to these natural areas significantly reduces the habitat value to herons. Full development (Alternative A) actually decreases the net loss of habitat value by about six AAHUs because habitat loss with phased development occurs over a greater period of time.

The Red-tailed Hawk utilizes all the habitat types on West Hayden Island (wooded areas for perching and nesting; open areas for feeding). As a result, this species would be the most affected in terms of AAHUs lost for each development alternative. The size of Red-tailed Hawk home ranges depends on the quality and distribution (interspersion) of habitat types utilized. Hawks occupying primarily wooded areas have larger home ranges than hawks living in areas of scattered woods interspersed with open areas for hunting (Petersen, 1979). The West Hayden Island HSI for this species is 0.78, indicating fairly good habitat conditions. In view of Red-tailed Hawk home range requirements [ie, 298 minimum average (Petersen, 1972)], the project site has

Table 4.2-II

NET CHANGE IN AAHUs
COMPARING WEST HAYDEN ISLAND DEVELOPMENT ALTERNATIVES
WITH THE NO ACTION (GRAZING) ALTERNATIVE

Species	AAHUs Alternative A	AAHUs No Development	Net Change
Great Blue Heron	17.72	70.64	-52.92
Wood Duck	0.26	1.60	-1.34
Red-tailed Hawk	29.17	475.07	-445.89
Downy Woodpecker	15.46	40.14	-24.68
Yellow Warbler	1.55	6.48	-4.93
Common Yellowthroat	2.01	6.72	-4.71
American Goldfinch	13.98	262.87	-248.90
Brush Rabbit	3.35	14.09	-10.74
Townsend's Vole	5.80	191.50	-185.70
Pacific Treefrog	36.67	351.49	-314.82

Species	AAHUs Alternative B	AAHUs No Development	Net Change
Great Blue Heron	17.78	70.64	-52.87
Wood Duck	0.15	1.60	-1.45
Red-tailed Hawk	90.81	475.07	-384.25
Downy Woodpecker	49.44	40.14	9.30
Yellow Warbler	6.10	6.48	-0.39
Common Yellowthroat	7.84	6.72	1.13
American Goldfinch	35.62	262.87	-227.26
Brush Rabbit	12.84	14.09	-1.25
Townsend's Vole	30.43	191.50	-161.07
Pacific Treefrog	124.90	351.49	-226.59

Species	AAHUs Alternative C	AAHUs No Development	Net Change
Great Blue Heron	11.56	70.64	-59.08
Wood Duck	1.45	1.60	-0.15
Red-tailed Hawk	113.13	475.07	-361.94
Downy Woodpecker	74.06	40.14	33.92
Yellow Warbler	8.51	6.48	2.02
Common Yellowthroat	9.43	6.72	2.72
American Goldfinch	39.83	262.87	-223.04
Brush Rabbit	18.35	14.09	4.26
Townsend's Vole	35.00	191.50	-156.50
Pacific Treefrog	174.16	351.49	-177.33

the capacity to support one pair, possibly two pairs, of hawks. Consequently, development activities on West Hayden Island will adversely affect up to two breeding pair. Limited feeding areas will be available to Red-tailed Hawks with Alternatives B and C, but the remaining undeveloped land would not totally provide all habitat needs.

Increasing the grazing capacity of the project site will directly benefit wildlife species that utilize meadow habitat. The HEP results reflect this condition for evaluation species that occur in this habitat type. All life requisites are provided to the Townsend's Vole and the Pacific Treefrog, whereas expanded feeding opportunities are provided to the Red-tailed Hawk and American Goldfinch. Because habitat conditions would be improved for these species without the proposed development, marine industrial development would result in the greatest net loss of AAHUs.

4.2.2 Aquatic Species and Habitat

Alternative A

Development of West Hayden Island will result in an overall reduction of suitable habitat for aquatic organisms of adjacent waters. Impacts on fishes and invertebrates would be of short- and long-term duration. Impacts in general would result from (1) initial dredging operations and resulting changes in river depth and substrate, (2) maintenance dredging, (3) ultimate alteration of existing shoreline, (4) placement of offshore structures, (5) ship traffic, and (6) water pollution from accidental spills and storm and surface runoff.

Initial dredging operations would remove and consequently alter river bottom habitat, resulting in mortality of sedentary-type organisms, primarily benthic invertebrates. Mortality would occur at the actual dredging site by direct removal of the substrate and the organism; and downstream, organisms would be suffocated by settling of suspended materials. Mortality mainly of oligochaetes, amphipods, and diptera larvae would be incurred in the areas proposed for dredging off the north and south sides of the island.

The plan proposes dredging to a depth of -45 feet CRD for a distance of about 7,350 feet along the north shore. Consequent removal of substrate would total about 1.5 mcy. Benthic invertebrate densities in the proposed dredging area range from 0-2,350/m^2; averaging from 597-1,263/m^2 at 10 feet, 567-1,080/m^2 at 20 feet, and 143-617/m^2 at 40 feet. At depths of 40-45 feet where the substrate is 100 percent sand, no organisms were present at several of the sampling stations. Dredging to 45 feet and leaving a predominantly sand substrate would result in a decrease of existing bottom fauna. Overall reduction in benthic organism numbers would be directly related to the amount of the more productive shallow water substrate removed. However, only 0.8 acres of shallow water habitat are proposed for dredging. If existing conditions are indicators, a 40-60 percent reduction in total organisms could be expected from dredging.

Eventual rip-rapping along most of the north shoreline as proposed would also obviously influence shoreline benthic production. Introduction of rip-rap would provide a different littoral habitat and could result in a shift of the biotic composition and an influx of invertebrates other than oligochaetes and amphipods (ie, ephemeroptera, trichoptera, diptera).

Effects of dredging on organisms downstream from the north shore site should be minimal. The substrate being dredged is greater than 90 percent clean, coarse sand, the dredging of which should not release large amounts of suspended materials nor increase turbidity to harmful levels. The resuspended materials would also be diluted and dispersed quickly by the volume of water and its velocity. Due to configuration of the river bottom and shoreline downstream, sediment load should be carried in the 20- to 40-foot water column. Mean densities of organisms in that area range from 1,655 m^2 at 20 feet to 1,060 m^2 at 40 feet, with amphipods and oligochaetes dominating.

Little is known of use of the north shore area by adult or juvenile fish. Migrant juvenile salmonids are shoreline-oriented, remaining in the upper water column. They are known to feed continuously on zooplankton and benthos while in fresh water and use shallow slower-moving water as resting areas. Benthic densities off the north shore are comparable to those of similar substrates in other areas of the Columbia. Due to the preferred shoreline habitat, slower-moving water, availability of at least a marginal food source, and the destruction of preferred shoreline habitat across from Hayden Island along the Washington shore, it is likely that salmonids utilize the north shore. Whether they just move through or use the site as a feeding or resting area is not known.

The north shore of the project site represents approximately 2 percent of the total natural shoreline of the Columbia River between the mouths of the Willamette and Sandy rivers (Table 4.2-IV). In addition, the 26 acres of shallow water along the site's north shore represents about 0.4 percent of shallow water. Only 0.8 acres of shallow water substrate would be dredged. No dredge or fill activities will occur between elevation +10 feet NGVD and -20 feet CRD as part of this permit. Adverse impacts to migrating salmonids, therefore, are expected to be minimal.

The main impact of dredging on juvenile salmonids would be the disruption or delay of downstream migration due to increased turbidity and the actual physical equipment and activities in the river. Gill abrasion can also occur with prolonged exposure to suspended materials. To avoid impacting downstream migrations of the important salmonid juveniles, dredging would not be undertaken during their migration period of March, April, May, and June. To avoid impacts to spring chinook smolts, dredging would also be curtailed in November.

Table 4.2-III

SHALLOW WATER ACREAGE ESTIMATES IN PROPOSED DREDGING AREAS, HAYDEN ISLAND

	Depth	Existing Acres	Postdevelopment Acres	Gain/Loss
Oregon Slough and Basin	0-20'	52	13.4	-38.6
North Shore	0-20'	26	25.2	-0.8

Table 4.2-IV

COLUMBIA RIVER SHORELINE DATA[a] BETWEEN THE WILLAMETTE AND SANDY RIVERS

Acres

Shoreline > 20 feet deep = 2,793

Shoreline < 20 feet deep = 7,070

Linear Feet of Shoreline

Natural sloped shoreline = 333,340

Developed shoreline[b] = 52,430

West Hayden Island = 30,520

West Hayden Island (PGE only) = 14,700

---

a Data compiled by Benkendorf Associates, Portland, Oregon.

b Greater than 3:1 slope.

Avoidance of dredging in the spring would also minimize potential impact on nonmigratory fish species. Most other species reported from the area (see Section 3.2.3) spawn in the spring in shallow waters and the young are free-swimming and foraging on their own by midsummer. Some of these fish may be displaced from the local area temporarily while avoiding the dredging activities; however, mortality would be negligible.

An increase in suspended materials and the noise and activity of dredging would likely cause avoidance of the immediate area by migrating adult salmonids. Whether migrating adults follow the Washington shore, the north shoreline of Hayden Island, or the Oregon Slough is not known. [The ODFW checked 15 boat anglers on the Washington side and 52 on the Oregon side in 1983. No fish were caught. Washington bank anglers caught 134 winter steelhead and there were no Oregon bank anglers (King, 1984).] Those fish following either shore of Hayden Island during dredging would probably avoid the area and continue upstream, perhaps resulting in a slight delay. Figures 3.2-IV and 3.2-V indicate which species would be affected during various times of the year.

Short-term effects on benthic organisms from dredging the basin on the south shore will be more apparent because of the nature of substrate, reduced current velocity, and number of organisms. Substrate in Oregon Slough in the area of dredging consists primarily of silt, mud, detritus, and some sand. Resuspension of substrate materials and resulting turbidity would be much greater than along the north shore. The area of settling out would also be concentrated, increasing risk of mortality by suffocation. Consequent mortality of existing benthic fauna would be significantly greater than on the north shore as indicated by sample estimates. Existing populations in the Oregon Slough number from 1,133 to 2,513 organisms per square meter at the 10- and 20-foot depths.

Much of the Oregon Slough off the proposed development site has previously been dredged to 40 feet, and at some 40-foot depths benthic invertebrate numbers are high (eg, 1,737/m^2). This would indicate that any future dredging in the slough would result mainly in short-term impacts. The benthic community evidently has the ability to reestablish itself in that particular substrate.

Regular maintenance dredging prevents reestablishment of benthic communities, since from one to two years are required for repopulation. In this case, however, maintenance dredging would be conducted infrequently and, therefore, repopulation is expected to occur.

Maintenance dredging in the Oregon Slough access channel will be minimal. Based on Terminal 6 experience, there will be virtually no maintenance dredging required. As a conservative estimate, a two-foot shoal over a 10-year period of about 10,000 cy of fine grain sediments may accrue in the Oregon Slough. An estimated 50,000 cy of sediment material would accumulate annually in the Columbia River access channel and turning basin. These materials are expected to be clean sand and probably would be sold, used as fill on-site, or disposed of in-water downstream.

Zooplankton and other free-floating organisms (fish larvae, phytoplankton, etc) would be exposed to effects of dredging operations for only a short term, since they are highly dynamic and quickly removed and replaced by currents. Mortality would result primarily from effects of increased turbidity. Loss of large quantities of zooplankton over an extended period of time would affect fish food production and ultimately alter occurrence and growth of juvenile fish in the area. Due to the extent and frequency of dredging, the generally clean nature of substrate, and the short-term exposure of organisms to the effects of dredging, however, impacts to zooplankton are expected to be minimal.

Alternative A proposes cutting away part of the south side of the island west of the railroad. This would create a lagoon of approximately 64 acres with an average depth of -40 feet CRD. With minimal current and a 3:1 sloping shoreline, this lagoon would create marginal warmwater fish habitat and 64 acres of sturgeon habitat. Since sturgeon are currently considered a principal sport fish of the area, a species-specific beneficial impact could be realized.

Alteration of existing shoreline and placement of offshore structures would affect aquatic fauna in the waters adjacent to both shores of the island. Development of the shoreline for ship and barge traffic would result in the removal of the existing riparian habitat, which is abundant on the south shore. The precise nature of these structures would be determined later and would require additional permits.

The south shore is protected from wind and wave action and is undisturbed by dredge spoil deposition. The shoreline plant community there is very important for it provides cover and organic detritus for the shoreline waters. Two different seasonal inland lagoons are also present when the water level exceeds +10 feet NGVD.

According to the U.S. Fish and Wildlife Service (DEIS comment letter, November 20, 1985), juvenile salmonid use of the Oregon Slough is minimal and it is not used as a rearing area. Consequently, in view of south shore development, impacts to salmonids would be minimal.

Table 4.2-III approximates the shallow water (0-20 feet) acreage which may ultimately be lost because of the project. A total loss of about 39 acres was estimated from the Corps' Hydrographic Maps CL 105-113 and CL 102-201. This dredge permit will affect 35.5 acres of shallow water habitat in the vicinity of the basin. Basin excavation and dredging would occur out to the existing channel in the Oregon Slough. An estimated 3.1 acres of shallow water would be affected in the authorized channel.

If bulkheads are necessary, as indicated for steel and general cargo, priority would be given to construction on the south shore where losses to habitat and organisms critical to salmonid survival would be less severe. Leaving the existing shoreline slope off the north side and utilizing finger piers would avoid loss of critical shoreline.

Installation of pile-supported structures such as finger piers would impact, on a short-term basis, fish in the immediate area of construction. Fish, if unable to avoid the area of activity, may be harmed by pile driving shock, which affects their swim bladders and nervous systems. Once structures are in place, however, no adverse impacts on aquatic organisms are expected. Water flows freely around support pilings, and they do provide additional substrate for sedentary algal species, which ultimately is beneficial to the benthic and fish communities. Impacts can be minimized by not conducting pile driving activities during March, April, May, and June.

Ship wakes on the lower Columbia River are known to strand shoreline-oriented juvenile fishes and to cause bank erosion. Development of West Hayden Island would increase ship traffic and result in additional fish stranding (mainly salmonids) and bank erosion.

Further degradation may result with actual development. This would be evaluated in the permit approval process for specific users.

Alternative B

Environmental effects will be similar to Alternative A, except less aquatic habitat will be disturbed in the Oregon Slough from the excavation of a smaller (ie, 40 acres) basin.

Alternative C

The entire south shore of the project site would not be developed. Therefore, no adverse impacts to aquatic species and habitat would occur in the Oregon Slough.

No Action

No increase in dredging activities will occur. There would be no effect on aquatic organisms and habitat.

4.2.3 Wetlands

Alternative A

HEP results indicate a low habitat value for evaluation species that occupy wetlands. With the exception of the Pacific Treefrog, adverse wildlife impacts to wetlands from marine industrial development on West Hayden Island are minimal. An estimated 76.5 acres would be lost during development, but in terms of its value to wildlife, only five AAHUs are affected (Table 4.2-II). Treefrog habitat requirements are less restrictive than many other wetland species which results in a greater habitat value and greater losses due to development.

Alternative B

Similar wetland impacts are expected with slightly fewer acres (ie, 24 wooded, 43 herbaceous) filled.

Alternative C

Most of the wooded wetlands would remain undeveloped (ie, 29 acres). However, approximately 43 acres of herbaceous wetland would be filled.

No Action

Wetland values will likely remain low due to the effects of grazing on the island. Livestock will continue to use these areas for drinking water, and their presence will prevent the development of typical shoreline and emergent vegetation.

4.2.4 Threatened or Endangered Species

Because no threatened or endangered species occur on West Hayden Island, no direct or indirect impacts from marine industrial development would occur.

4.3 Social and Economic Effects

4.3.1 Compatibility With Land Use Plans

The Multnomah County Comprehensive Plan designates West Hayden Island as urban for future marine industrial development. The Multnomah County Comprehensive Plan Policy No. 33a, Marine Transportation System, states it is the county's policy "to identify, evaluate, and encourage development of sufficient needed port and marine facilities. It is also the county's policy to ensure an inventory of acreage is available for marine transportation facilities." Through the county's land use process, it was determined that West Hayden Island would meet this policy. The urban designation has the following development conditions: a bridge, the extension of utilities, on-site rail and roads, improved access to the 40-foot channel, and provision of flood protection. Also as part of the county's process, a transportation study and a balancing of environmental and economic concerns will be considered. The placement of fill will require a conditional use permit and all development in the county is subject to design review at the time building permits are issued. All anticipated actions under the requested permit are designed to implement that plan.

Alternative A

This alternative would provide the maximum land and potential for waterfront development.

Alternatives B and C

These two alternatives would provide lesser amount of land to meet the county's policy.

No Action

If the fill permit for West Hayden Island is denied, the county will need to amend its comprehensive plan to provide for marine industrial development elsewhere in the county.

4.3.2 Local and Regional Economic Effects

Employment

Development of West Hayden Island for marine industrial purposes would result in the addition to the economy of numerous high-quality, high-paying jobs and would indirectly result in substantially more jobs in the community. The proposed marine industrial development would add to the growth and diversification of markets for Oregon and Pacific Northwest products.

To determine reasonable projections of employment which could be generated from marine industrial use, an analysis was conducted of employment densities (ie, employees per acre) in Rivergate (Appendix D-2). It was found that the average employment density for nonwaterfront industries and support services is 8.4 employees per acre; this is only slightly higher than the density of 7.9 in industrial plants constructed in Portland between the years of 1970 and 1978 (Cogan, 1982). Probable employment density for nonwaterfront uses is assumed to be 8.0 employees per acre.

As noted in Appendix D-2, the average employment density for Rivergate's waterfront users, including the facility at Terminal 6 and several private industrial processing plants, is 1.3 employees per acre. This is comparable to employment densities at Terminal 4 which range from 1 to 1.5 employees per acre. Terminal 4 is an example of a public port facility which handles a wide variety of commodities including grain, dry and liquid bulks, steel, automobiles, and containers.

It is anticipated Hayden Island will provide a similar range of facilities to those at Terminal 4 (ie, a combination of private industrial processing plants, public facilities for storage, transshipment of grain, dry and liquid bulks, autos, and noncontainerized logs and wood products). West Hayden Island is unlikely to attract labor-intensive general cargo and container terminals because the Port of Portland projects no additional need for the former by the year 2000 and has adequate acreage for expansion of the latter at Terminal 6.

Table 4.3-I contains a detailed analysis of the employment impacts of the alternatives which were studied. In addition to the permanent jobs, there would be significant employment involved in the construction of the facilities over an extended period of time. Marine industrial employment also supports a large secondary labor force. These projections are consistent with those included in the land use studies.

Table 4.3-I

PROJECTED EMPLOYMENT FOR WEST HAYDEN ISLAND ALTERNATIVES

Land Use	Developable Acres	Employees Per Acre	Total Employment
Alternative A			
Marine	357.0	2	714
Supporting Industrial	94.4	8	755
Total	451.4		1,469
Alternative B			
Marine	332.0	2	664
Supporting Industrial	19.4	8	155
Total	351.4		819
Alternative C			
Marine	329.7	2	658
Supporting Industrial	0.0	0	0
Total	329.7		658
No Action			
Agriculture	496.0	0	2

Local Taxes and Payroll

The development of the island would result in a significant tax resource for federal, state, and local governments. Table 4.3-II indicates the estimated tax value and likely taxable income for the various alternatives.

No Action

If marine industrial development does not occur at this site, the beneficial economic effects associated with the expansion would not occur. Use of the site for agriculture or silviculture would produce minimal benefits to the local economy.

Table 4.3-II

ANNUAL TAX GENERATION ANALYSIS
(Thousands*)

Alternative	A	B	C	No Action
Property Value	43,458	32,208	29,000	595
Facility Value	260,000	203,000	180,000	50
Total Value	303,458	235,208	209,610	645
Payroll	33,705	19,855	16,450	42
Property Tax	7,282	5,644	5,030	154
State and Federal Income Tax	10,111	5,956	4,935	12
Total Tax	17,393	11,601	9,965	28

* 1986 dollars.

4.3.3 Transportation Systems

A. Land Transportation

A major element in the land use process was the impact of the future development on the transportation system. A detailed analysis of traffic generation, trip distribution, and capacity problems associated with the proposed development on West Hayden Island is contained in the land use report (Cogan, 1982). This study was evaluated by the transportation planners from Multnomah County, Metro, and the Oregon Department of Transportation.

The employment base and traffic generation were computed for each of the three development alternatives using the same methodology as the land use study (Appendixes D-3 and D-4). The projected traffic generation is lower than the low range described in the land use studies (Cogan, 1982) and approved in the land use change. This is a direct result of a more specific development plan which has less developable acres than was included in that analysis. Alternatives B and C would have less traffic than Alternative A.

These traffic figures for full development were distributed in the regional transportation model. Because of the reduced number of trips and the redistribution of some trips by the model, there was no major traffic problem. The Interstate 5 Bridge continued to be the major problem with or without West Hayden Island.

One condition of the land use approval was that a more detailed transportation study and program be prepared prior to actual development and implemented as necessary to alleviate adverse impacts.

The land use approval also required a bridge to provide a second access to the island. Because of the low number of employees per acre and low traffic generation, one or two developments could be accommodated on the existing system.

B. Marine Transportation

The projected need for marine industrial land on the 40-foot channel in Portland is described in detail in the land use study (Cogan, 1982). There is an identified need for approximately 1,000 acres of land by the year 2000.

This need does not include any land factor related to an inventory beyond that period or any market factor (ie, additional land to provide a choice in the marketplace). Expansion of gravel, relocation of waterfront users in the south waterfront to the John's Landing area, and a 25 percent inventory factor would require an additional 385 acres. There is, therefore, a total of 1,400 acres maximum projected demand in the Portland metropolitan area.

The following chart identifies the amount of developable acreage in each of the alternatives being considered:

DEVELOPABLE ACREAGE

Alternative A	451.4 acres
Alternative B	351.4 acres
Alternative C	329.7 acres
No Action	0.0 acres

Growth of the marine transportation system in Portland will contribute to increased use of the river and a more efficient use of such public expenditures as the 40-foot channel, the locks on the upriver dams, and the deepening of the mouth of the Columbia River project, as well as others.

C. Potential Conflicts

Alternatives A, B, and C

Because the development of West Hayden Island is a continuation of the development pattern of both Rivergate and the Port of Vancouver, it is unlikely that any new conflicts with the existing river traffic would be created. The Vancouver anchorage being proposed by the Coast Guard has been designed to ensure ship access to the north shore of West Hayden Island.

Existing conflicts between recreational and commercial uses may be exacerbated. This project would increase the use of sections of the river by commercial ships and barges and thereby make these areas less desirable for recreational boaters. This may require increased emphasis on operational guidelines and boater safety education for new recreational boaters. Existing users are well aware of the hazards and are able to avoid the problems.

Conflicts between truck and auto traffic would be basically the same as currently exist for Rivergate. The majority of the traffic would use the same system: Marine Drive, North Portland Road, and the Interstate 5 freeway. The traffic would also be the same general composition of employees and truck traffic.

One specific area of conflict which will be studied and resolved in developing the transportation management program is the connection between East and West Hayden Island. Restrictions which have been discussed include a limitation to auto traffic only and a closure of the connection during the peak hours. The proposed improvements to Marine Drive currently being studied by the City of Portland would reduce the need for this connection.

No Action

The increase in highway and marine traffic associated with the project would not occur.

4.3.4 Utilities

The west end of the island does not currently have an urban level of services. There is a BPA major electrical transmission corridor at the west end of the PGE property. There is also a PGE transmission line

and substation. The transmission corridor and substation would not be disturbed. The PGE line may be relocated to follow the interior road.

Other services would be provided by annexing to the city of Portland or by developing private systems and service contracts. The design, location, and agreements concerning these facilities are currently being discussed in conjunction with the future annexation of the west end of the island. The city of Portland water supply and sewer treatment facilities all have adequate capacity to serve the development. Water would be available from the city of Portland on annexation.

Alternatives A, B, and C

Table 4.3-III summarizes providers of public services and facilities to serve future development of West Hayden Island. All development alternatives have similar needs for public services. The changes in developable acreage would modify the specific sizing of the facilities. The major change between the three alternatives would be the number of developable acres to support the costs of development.

No Action

Extension of utilities to the site would not be required.

4.3.5 Aesthetics

The project site can be seen from the Oregon and Washington shorelines from the east end of the island and from the river.

Alternative A

The major visual changes would occur in the view from the river and from the Oregon and Washington shorelines where the view of the natural vegetation and shoreline would change to a view of marine industrial development with ships, piers, and structures. The view would be comparable to the existing view of both the Oregon and Washington shorelines. The two channels are used by both commercial and recreational boaters. This change can be softened by maintaining clusters of cottonwood trees along the top of the bank. The ability to do this would vary depending upon the ultimate configuration of facilities along the shore.

The two nonconforming houseboat moorages in the Oregon Slough would experience significant change in view across the channel from the natural tree-lined shoreline to a marine industrial development. The view across the channel would become similar to the developments on either side of these moorages.

In the plan, there would be a 64.4-acre increase in water area. Because the sites within this basin would be smaller, it is likely they would be used for tug and barge operations rather than ships.

Table 4.3-III

ALTERNATIVE SERVICE PROVIDERS

Service	Potential Provider(s)
SEWAGE	
Collection - On-Site	- Private developer
Collection - Off-Site	- City of Portland
Treatment	- City of Portland - Hayden Island, Inc. plant - Special service district
FIRE PROTECTION	- City of Portland through Hayden Island Fire District (includes emergency services)
POLICE	- Multnomah County - City of Portland - Private security firm
TRANSPORTATION	
Streets - On-Site	- Private developer
Bridge	- Public/private share cost
Streets - Off-Site	- Private/public share cost
Transit	- Shuttle for employees from Clark County - Expanded Tri-Met service
MISCELLANEOUS UTILITIES	
Telephone	- Pacific Northwest Bell
Electricity	- Portland General Electric
Natural Gas	- Northwest Natural Gas
RECREATION	
Facilities	- Private developer

There would be minor changes in the view from East Hayden Island and from the Interstate 5 Bridge from certain perspectives. There is currently a fringe of cottonwood trees behind the existing commercial and industrial development. This effect can be maintained by leaving a row of cottonwood trees parallel to the Burlington Northern Railroad.

Alternative B

The basin and natural area around it would enhance the view in this area. The remainder of the island would be the same impact as in Alternative A.

Alternative C

In Alternative C, the entire south shore of the island would remain essentially as is or would be enhanced as part of a mitigation plan.

No Action

The visual character of the site would remain as vegetated open space, although modification would occur with more intensive agricultural or silvicultural activities.

4.3.6 Noise

With the development of West Hayden Island, noise levels in the immediate area would be increased, depending on the size and type of development. The accompanying transportation corridors, which may include increased truck traffic and the addition of railroad spurs and switching activities, would also increase noise levels. These noise producers are, however, exempted from the Washington Administrative Code noise restrictions and the Oregon Administrative Rules.

The Oregon environmental noise restrictions are designed to protect "noise-sensitive" properties, without regard to zoning or land use designations. These "noise-sensitive" properties are defined as "real property on which people normally sleep and attend schools, churches, and public libraries". The closest properties to Hayden Island falling into the "noise-sensitive" category are the two houseboat developments directly across the Oregon Slough from the site.

Measures would be taken, if necessary, to assure compliance with state noise regulations. Specific control measures would be defined by the frequency and intensity of the sound being produced. Alternate measures could include administrative controls, specific siting criteria, or engineering methods ranging from individual component isolation to barriers surrounding entire facilities. The need and definition for any or all of these measures would be determined after the specific noise emission characteristics of the development are known.

No Action

Without industrial development, increases in noise levels associated with the project would not occur.

4.3.7 Light and Glare

Alternative A

Light and glare effects similar to those experienced at the Rivergate Industrial Park and at the Port of Vancouver on the north side of the island would occur. These effects would be most noticed by residents of the two houseboat moorages on the Oregon Slough and, depending on the type of development, there may be light and glare effects 24 hours a day or at intervals throughout the day.

Alternatives B and C

The light and glare would be reduced on the south side of the island where development does not occur.

No Action

No increase in light and glare would be anticipated.

4.3.8 Recreation

Alternatives A, B, and C

Marine industrial and port terminal development will change the character of the property and remove substantial acreage from its open state. This development will preclude casual picnicking on the shores. The actual use of the island for recreation would not change because the current use of the land requires strict control of public access to eliminate conflicts between the livestock and recreational users. Development of the island would reduce the "potential" to use the island for public recreation in the future.

No Action

The existing conflicts between the occasional recreational users and the livestock operation would continue.

4.3.9 Cultural Resources

Because no cultural resources occur on West Hayden Island, no direct or indirect impacts from marine industrial development would occur.

4.4 Mitigation Alternatives

Before a mitigation plan is approved and implemented, a series of planning steps will be taken to assure completeness, feasibility, and compliance with appropriate regulations and compatibility with local natural resource and land use goals. The proposed West Hayden Island development alternatives lend themselves to a variety of mitigation solutions. Alternative A would require some form of off-site mitigation because most of the project site would be used for marine industrial activities. Alternatives B and C, however, utilize only a portion of the property, providing opportunities for on-site mitigation.

Wetlands on West Hayden Island will be the primary focus of the final mitigation plan because of specific regulatory requirements in Section 404 of the Clean Water Act. Consideration of unregulated habitat types (eg, cottonwood/ash) will be made and incorporated into the plan. Mitigation measures addressing adverse impacts to aquatic habitat will emphasize minimizing those impacts.

The West Hayden Island Mitigation Planning process will be conducted in three steps. The first step will be to determine the final development project plan and its associated effects. The Final Environmental Impact Statement and subsequent record of decision by the U.S. Army Corps of Engineers and the habitat evaluation study will indicate the approved project plan. Once a project alternative has been approved, mitigation needs can be specifically defined and an appropriate mitigation site(s) selected.

The design and approval of a detailed mitigation plan for West Hayden Island will be the second step of the mitigation process. An approved mitigation plan will be a condition of the fill permit granted by the U.S. Army Corps of Engineers. Project construction and mitigation plan implementation will be initiated concurrently in Step 3. Proposed phased development on West Hayden Island would permit phased mitigation implementation. Mitigation phasing would allow time for corrective actions in the program and time for new habitat establishment prior to some of the actual habitat losses.

4.4.1 Dredge/Fill Impact Mitigation

Certain general measures can be taken to reduce overall effects associated with the dredge/fill operations on West Hayden Island:

1. Use of dredge curtains would minimize sedimentation downstream of the dredging operation.

2. Use of temporary berms or other containment structures would allow settling of suspended sediments of fill material. This would reduce short-term turbidity in the Columbia River and Oregon Slough.

3. The excavation of the 40- to 64.4-acre basin in the southeast corner of the project site would be done behind a shoreline berm. Keeping the shoreline intact to the end of the excavation would contain turbid waters.

4. Curtailment of river dredge/fill activities in the spring (March, April, May, June) and November would avoid impacts to downstream juvenile salmonid migrants and spring chinook smolts, respectively. Avoidance of spring dredging would also reduce impacts to spawning resident fish.

5. Initiating the fill operation along the northern portion of the project site would temporarily avoid impacts to more important wildlife habitats along the Oregon Slough.

6. Observance of appropriate filling setback limits would preclude damage to the existing Portland sewer outfall line on the east edge of the project site.

7. Although not associated directly with dredge/fill activities, shoreline structures such as bulkheads will be limited to the south shore to protect shallow water habitat along the north shore.

4.4.2 Off-Site Mitigation

PGE has identified four sites along the Columbia River south shore as possible locations for compensating wetland and other habitat losses on West Hayden Island (Figure 4.4-I). Two sites on Smith Lake in north Portland have potential wetland enhancement opportunities. In east Multnomah County, lowlands and agricultural areas north of NE Sandy Boulevard between NE 158th and NE 185th may be acquired for wetland and riparian habitat restoration. Government Island, as well as Multnomah County property adjacent to the Bybee/Howell House on Sauvie Island, have off-site mitigation potential.

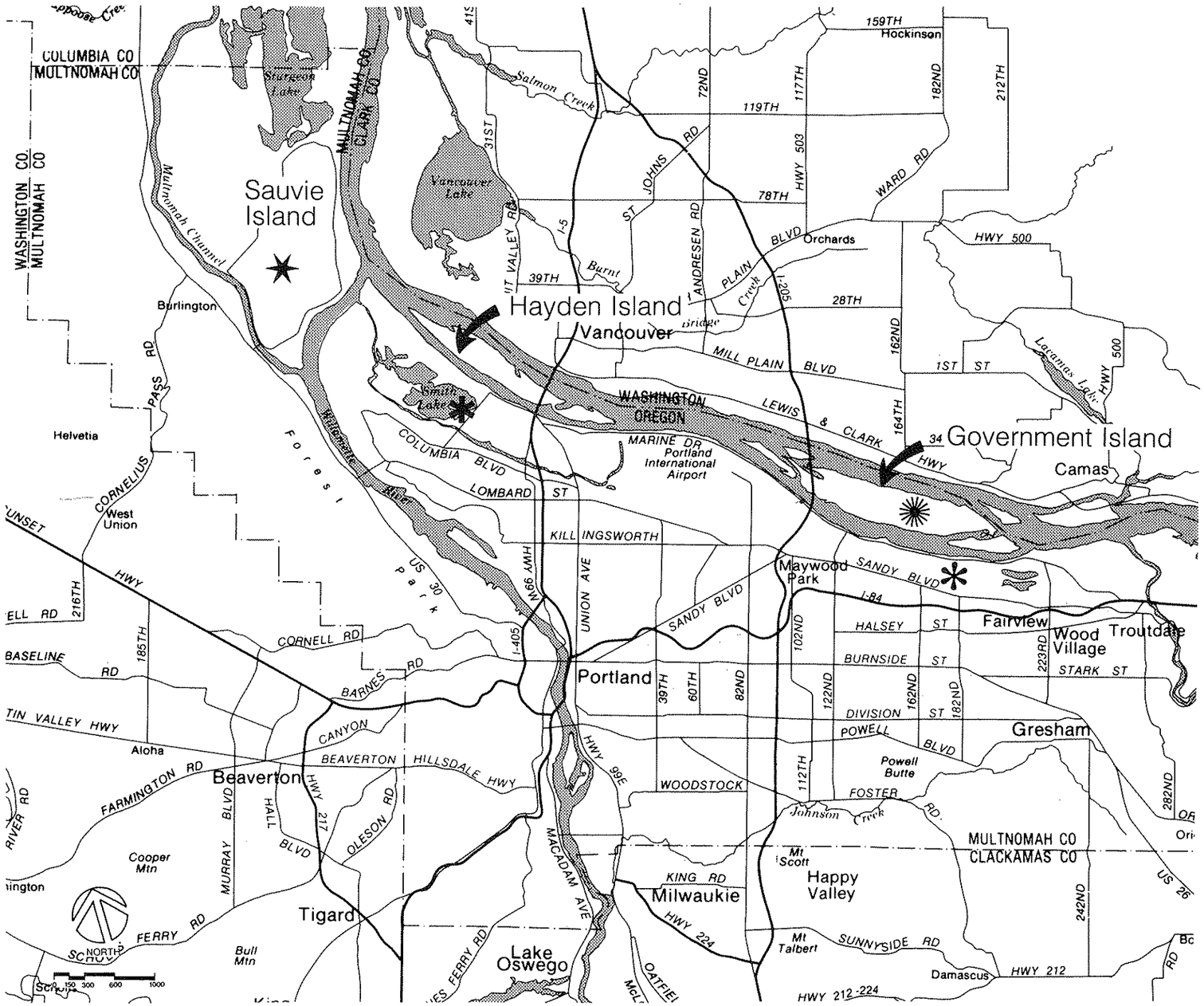
The Smith-Bybee lakes area in north Portland has long been an important wetland resource. However, these shallow lakes (especially Smith Lake) have experienced natural succession toward a shallower habitat. Poor water circulation and irregular water level fluctuation have promoted the advancement of vegetation (eg, willows, smartweed) into the lakes. During some years, Smith Lake has completely dried.

In an attempt to stabilize the water level in Smith Lake, the U.S. Fish and Wildlife Service placed a temporary fill dam and a 5-foot culvert at the upstream end of North Slough in 1982. This action was in response to a waterfowl botulism problem in the area. Vegetation advancement into Smith Lake was curtailed, but the natural filling process continues to a lesser degree. A more comprehensive and intense management program in the Smith-Bybee lakes is required if the site is to be maintained as a viable wetland.

Portland General Electric

HAYDEN ISLAND

Off-Site Mitigation Locations



LEGEND

- Columbia South Shore
- Government Island
- Sauvie Island
- Smith Lake

Benkendorf Associates
Ogden Beeman & Associates

Figure 4.4 - I

PSD006402

Two sites at Smith Lake have habitat improvement potential. Site A, under private ownership, is a composite of open water, willow/ash, mud flat, and meadow habitat. The establishment of a water control program would be the basis for a wetland management plan on Smith Lake. For example, dredging in various areas to deepen existing waterways would aid in retaining available water on the mitigation site.

Once a water management program is implemented, efforts (eg, replanting, seeding) to establish native wetland vegetation (eg, cattail, Columbia sedge, slough sedge, wapato) can begin. Certain areas may also be drained to establish riparian zones and islands could be created from dredged material.

When habitat conditions improve in the area, wildlife populations will respond accordingly. However, placement of nest boxes of various sizes, nesting tubs for Canada Geese, and roosting boxes for bats would facilitate the use of the area by wildlife.

Site B, under City of Portland ownership, is located on the northeastern edge of Smith Lake. The area is drier than Site A and dominated by willow habitat. As on Site A, similar habitat improvement activities can be employed. However, this site may require more intense water management actions and clearing of some of the willows to achieve desired habitat restoration objectives.

The east Multnomah County mitigation site provides an opportunity to reclaim agricultural lands to natural wetland and riparian habitat. Although habitat creation versus habitat enhancement efforts are more complex, the net gain in habitat improvement per unit area is significantly greater; that is, less land may be required to compensate for the loss of habitat on West Hayden Island.

In general, the preparation of this mitigation site for wetland establishment would involve the development of specific land contours and modification of the water regime to support wetland vegetation. Water from the Columbia Slough could be partially diverted by means of various water control devices, channeling, and land modification. Excavation may also allow use of groundwater (ie, perched water table). The elevation and slope of the land contours would dictate the types and distribution of wetland vegetation established on-site. Areas of higher elevation could be used to plant riparian vegetation (eg, cottonwood, ash, willow).

Government Island in the Columbia River (RM 113-118) could also provide in-kind mitigation opportunities. This island has similar habitat characteristics as West Hayden Island and significant habitat improvement potential. However, enhancing Government Island for wildlife may increase hazard of bird/aircraft collisions at the nearby PIA.

The potential of any of these off-site areas for mitigation would be derived from the results of the habitat evaluation study conducted in 1985. Comparison of future habitat values under various habitat management scenarios with existing values would demonstrate which areas

had the greatest potential for improvement. Land availability, compatibility with surrounding land uses, land cost, and existing zoning are other factors that would influence final site selection.

4.4.3 On-Site Mitigation

Development Alternatives B and C offer on-site mitigation opportunities because only a portion of the project site would be subject to development.

Results of the habitat evaluation study conducted on West Hayden Island will be used to determine the extent of habitat value loss and the remaining habitat available for restoration activities. On-site mitigation plans will focus on compensating for wetlands lost during the fill operation and also address riparian habitat losses.

Alternative A proposes to excavate the southeast corner of the site to provide fill material for the remainder of the area. This would create a lagoon of approximately 64 acres with an average depth of 40 feet. With minimal current and a shoreline slope of 3:1, this lagoon would create marginal warmwater fish habitat and 64 acres of white sturgeon habitat. Because sturgeon are currently considered a principal sport fish, a species-specific beneficial result could be realized.

Alternatives B and C offer undeveloped natural areas along the south shore for habitat improvement. A wildlife habitat area around a proposed 40-acre basin is featured in Alternative B, and the entire south shore would remain in a natural condition in Alternative C. In both these alternatives, wetland habitat on the south shore can be expanded and improved by modifying land contours to allow greater influence from the Oregon Slough. The elimination of grazing on the project site would also facilitate natural revegetation of wetlands as well as improve understory vegetation in riparian habitat. A supplemental planting program could be implemented to hasten the restoration process.

The location and size of a mitigation site depends on the final development master plan selected for West Hayden Island. The variety of development options results in different habitat impacts which in turn allow for a number of mitigation solutions. Specific habitat restoration objectives, activity scheduling, evaluation criteria, and mapping of a particular mitigation site would be developed during the plan design process.

5.0 Review and Consultation Requirements

5.0 REVIEW AND CONSULTATION REQUIREMENTS

5.1 Public Involvement

5.1.1 By PGE

The development planning process carried on by PGE since 1980 has included extensive public involvement. There were direct contacts with more than 64 individuals, 22 public agencies, and 19 private groups and interests during the land use planning phase of the project. The Multnomah County Planning Commission, the Multnomah County Board of Commissioners, and the Metropolitan Service District each held hearings during this process. In addition, a public meeting and workshop was held.

On February 28, 1984, PGE Senior Vice President James W. Durham sent a letter describing the proposed development to over 400 people in Oregon and Washington who had expressed an interest or previously participated in the West Hayden Island process (Appendix D-1). PGE representatives have held informational meetings with members of the Oregon and Washington congressional delegations and their staffs.

Several groups have been organized by PGE to supplement public involvement in the environmental impact statement process: a Bridge Users' Group and an Environmental Group. The Bridge Users' Group held its initial meeting in November and will be meeting throughout the process to discuss issues relating to construction of a bridge over the Oregon Slough. The Environmental Group has had several meetings. In addition, PGE formed an HEP committee to evaluate West Hayden Island habitat and explore mitigation alternatives.

Representatives of PGE have attended meetings of the Board of Directors of Class Moorage and the North Portland Citizens' Committee. Local government officials and entities and state officials and agencies have been informed throughout the process.

The North Portland Citizens' Committee has been an active participant in the West Hayden Island development process. Numerous presentations have been made to the board and membership on land use issues and the environmental impact statement process.

5.1.2 By Corps

A Notice of Intent to Prepare an Environmental Impact Statement was distributed by the Portland District U.S. Army Corps of Engineers on August 31, 1984, formally initiating the EIS scoping process.

The DEIS underwent a 45-day public review period which began on September 27, 1985, and the comments received have been taken into consideration in the preparation of the FEIS. A copy of the comment letters received and responses to those comments are included in Appendix E of this FEIS. Copies of this FEIS are being sent to those who commented on the DEIS; other interested federal, state, and local agencies; private organizations; and members of the public.

5.2 Compliance With Federal Legislation and Executive Orders

1. Archeological and Historic Preservation Acts. Cultural resources investigations were conducted on West Hayden Island. The results of these investigations were coordinated with the Oregon State Historic Preservation Office (see Sections 3.3.9 and 4.3.9).

2. Clean Air Act. The U.S. Environmental Protection Agency has been provided a copy of the DEIS for review and comment as required by Section 309 of this Act.

3. Clean Water Act. PGE has applied to the Corps of Engineers for a permit under Section 404 of the Clean Water Act and Section 10 of the River and Harbor Act of 1899. The EIS was prepared as part of the process of reviewing that permit application. A Section 404 water quality evaluation will be prepared for this proposal.

4. Coastal Zone Management Act. Not applicable. The project site is not located within the coastal zone.

5. Endangered Species Act. The U.S. Fish and Wildlife Service has been consulted and has stated that there are no known threatened or endangered species in the project area.

6. Fish and Wildlife Coordination Act. This project has been coordinated with federal and state fish and wildlife agencies throughout the permit review process.

7. Marine Protection, Research, and Sanctuaries Act. This Act is not applicable.

8. National Environmental Policy Act. The FEIS was prepared in compliance with this Act.

9. River and Harbor Act. PGE has applied to the Corps of Engineers for a permit under Section 10 of this Act. The FEIS was prepared as part of the process of reviewing the permit application.

10. Executive Order 11988, Floodplain Management. The project area proposed for filling is located entirely within the 100-year floodplain of the Columbia River. The shoreline is also in the designated floodway. Utilizing the HEC-2 model and previous floodplain studies, it was determined that the project would not interfere with flood flows or significantly increase flood heights in the area. The natural values of the floodplain, including aesthetics, riparian habitat, and other vegetation and associated wildlife would be eliminated in the filled area. These natural values would be, at least partially, replaced by the proposed habitat mitigation.

11. Executive Order 11990, Protection of Wetlands. Up to 76.5 acres of wetlands would be filled if the proposed action is implemented. Off-site and/or on-site mitigation is proposed to compensate for this wetland loss. Section 4.4 of the FEIS discusses the planned approach to mitigation. The District Engineer will weigh the impacts of the wetland filling against the public benefits to be gained, taking the proposed mitigation into consideration in making his public interest determination to issue or deny the permit application.

12. Analysis of Impacts on Prime and Unique Farmlands. The proposed project would have no impacts on prime and unique farmlands.

13. State and Local Land Use Plans. The Multnomah County Comprehensive Plan designates West Hayden Island as urban for future marine industrial development. The Oregon Land Conservation and Development Commission has acknowledged that the Multnomah County Comprehensive Plan complies with the statewide goals and guidelines. The proposal to fill the PGE property to make it suitable for development as marine industrial sites appears to be compatible with this plan. If a Corps permit is issued, it would be conditional upon the applicant obtaining all appropriate state and local permits and approvals.

LIST OF PREPARERS

Name	Discipline/Expertise	Experience	Role in EIS Preparation
David Kurkoski Corps of Engineers	Geography, Environmental Planning	Environmental Impact Assessment	DEIS Coordinator
Eric Braun Corps of Engineers	Wildlife Biology/ Environmental Planning	Environmental Impact Assessment	FEIS Coordinator
Ron Marg Corps of Engineers	Civil Engineering	Regulatory Review	Project Manager/ Regulatory Review
Brian Lightcap Corps of Engineers	Forestry/Wetland Ecology	Wetlands Evaluation/ Regulatory Review	Environmental Review/Wetlands Designation
Wayne Lee U.S. Coast Guard	Environmental Impact Analysis	Environmental Impact Assessment and Review	Cooperating Agency Representative
PGE			
David E. Fredrikson	Land Use Planning, Landscape Architecture	Land Use Planning	Project Manager
Ronald J. Klein	Biology/Wildlife Science	Environmental Assessment, Monitoring, Mitigation Planning	Vegetation and Wildlife Impact Assessment
Lynne Saxton	Urban and Regional Government	Public Affairs	Public Involvement Coordinator
Bruce Carpenter	Business Administration	Finance	Analyst
Bruce Ostly	Real Estate	Land Appraisal	Analyst
Lavinia Wihtol	Law	Environmental Law	Attorney
Stephen C. Bullock	Biology/Fisheries Science	Environmental Monitoring, Fish and Aquatic Invertebrate Studies	Aquatic Species and Habitat Impact Assessment
Scott A. Turner	Audiology/Noise	Noise Monitoring, Impact Evaluation, Noise Control Design	Noise Impact Assessment

LIST OF PREPARERS (concl)

Name	Discipline/Expertise	Experience	Role in EIS Preparation
Lolita M. Carter	Biology/Aquatic Ecology	Groundwater/Water Quality Monitoring and Analysis, Environmental Chemistry	Groundwater, Water Drainage, Water Quality Impact Assessment
Terry D. Worrell	Meteorology/Air Quality	Air Quality Monitoring, Analysis, and Modeling; Meteorological Analysis	Air Quality Impact Assessment
Linda J. Klein	Environmental Sciences/ Air Quality	EIS Preparation/ Regulatory Review	FEIS Coordinator
Mary Alice Dinsmore Terri Huggins Dani Nicolay			Word Processing Services
Consultants			
Ogden Beeman & Associates	Marine Industrial Development, Hydrology	Civil Engineering Specializing in Waterway Development	Consultant
Carl Buttke Inc.	Transportation Engineering	Transportation Planning	Consultant
Benkendorf Associates	Land Planning and Development	Land Use Planning	Consultant

BIBLIOGRAPHY

Allen, A. W. Habitat Suitability Index Models: Eastern Cottontail. U.S. Fish and Wildlife Service. FWS/OBS-82/10.66. 1984.

American Ornithologists' Union. Checklist of North American Birds. 6th ed. 1983.

Beak Consultants, Inc. Operational Ecological Monitoring Program for the Trojan Nuclear Plant - Annual Report. March 1977.

Beranek, Leo L. Noise and Vibration Control. 1971.

Buell, James W., PhD, and Thomas G. Giese, MA. Review of Aquatic and Terrestrial Biological Resources of the Western Portion of Hayden Island. August 1980.

CH_2M-Hill. The Port System Study for the Public Ports of Washington State. 1980.

CH_2M-Hill. River Bottom Sediment Sampling and Analysis Report. September 1983.

City of Portland, Office of Planning and Development. Portland Industrial Land and Employment Analysis Vol II. April 1979.

City of Portland. 1982 Neighborhood Information Profiles. November 1982.

Code of Federal Regulations. 40 CFR 110, 112. 1983.

Code of Federal Regulations. 33 CFR 145, 157. 1983.

Cogan and Associates. Hayden Island - Proposed Amendment to the Multnomah County Comprehensive Plan for the West Hayden Island Area. May 1982.

Craddock D., T. Blahm, and W. Parente. Occurrence and Utilization of Zooplankton by Juvenile Chinook Salmon in the Lower Columbia River. January 1976.

Dames and Moore. Preliminary Geotechnical Investigation, Proposed Industrial Development, Hayden Island for Portland General Electric Company. March 1985.

Durkin, J. T., and R. J. McConnell. A List of Fishes of the Lower Columbia and Willamette Rivers. November 1973.

Ellis, D. V. A Cultural Resources Study of the Proposed Hayden Island Marine Industrial Park, Multnomah County, Oregon. Willamette Associates CRM Report, No. 14. 1986.

Eriksen, Spence. Personal telephone conversation. Oregon Department of Environmental Quality. December 4, 1984.

Fies, Ted T. Surveys of Some Sloughs of the Lower Columbia River. January 1971.

Fletcher, J. L., and R. G. Busnel (eds). Effects of Noise on Wildlife. 1978.

Franklin, J. F., and C. T. Dyrness. Natural Vegetation of Oregon and Washington, U.S. Forest Service General Technical Report PNW-8. 1973.

Harraban, Pat. Personal telephone conversation. Oregon Department of Environmental Quality. November 13, 1984.

Hitchcock, C. L., and A. Cronquist. Flora of the Pacific Northwest. 1973.

Idaho Water Resources Board. 1969.

Ingles, L. G. Mammals of the Pacific States: California, Oregon, Washington. 1965

King, Steven D. The 1983 Lower Columbia River Recreational Fisheries, Bonneville to Astoria. 1984.

King, Steven D. The 1985 Lower Columbia River Recreational Fisheries, Bonneville to Astoria. 1986.

Larrison, E. J. Mammals of the Northwest. 1976.

McConnell, R. J., and T. H. Blahm. Occurrence of Fish Near the Proposed Kalama Nuclear Power Plant Site - Columbia River. 1973.

Meinke, R. J. Threatened and Endangered Vascular Plants of Oregon: An Illustrated Guide. 1981.

Metropolitan Service District. Regional Transportation Plan. March 1982.

Misitano, D. A. A Checklist of Zooplankton in the Lower Columbia and Willamette Rivers. November 1973.

Multnomah County Comprehensive Plan. July 1980.

National Oceanic and Atmospheric Administration. Local Climatological Data: Monthly Summary, Portland, Oregon, International Airport. 1976-1985.

National Oceanic and Atmospheric Administration. Local Climatological Data, Annual Summary 1983, Portland, Oregon. July 1984.

Ogden Beeman & Associates. Oregon Ports Study. 1980.

BIBLIOGRAPHY (cont)

Ogden Beeman & Associates. Unpublished. 1981.

Oregon Administrative Rules: Chapter 340, Division 20, Division 25, Division 31, and Division 35.

Oregon Administrative Rules: Chapter 340, Division 41, Section 205. North Coast-Lower Columbia River: Water Quality not To Be Exceeded.

Oregon Department of Environmental Quality. 1983 Air Quality Annual Report. July 1984.

Oregon Department of Environmental Quality. Oregon Groundwater Protection Policy. 1980.

Oregon Department of Environmental Quality. Requirements for Sound Measuring Instruments and Personnel NPCS-2.

Oregon Department of Environmental Quality. Sound Measurement Procedures Manual NPCS-1.

Petersen, L. R. Biology of Raptors in Southern Wisconsin. Wisconsin Department of Natural Resources, P-R Proj. Rep. W-141-R7. 1972.

Petersen, L. R. Ecology of Great Horned Owls and Red-Tailed Hawks in Southeastern Wisconsin. Wisconsin Department of Natural Resources, Technical Bulletin 111. 1979.

Peterson, A. P., and E. E. Gross. Handbook of Noise Measurement. 1972.

Port of Portland. Marine Terminals Master Plan. 1980.

Portland General Electric Company. Preoperational Ecological Monitoring Program for the Trojan Nuclear Plant. August 1975.

Powell, Totten & Co. Appraisal Report West Hayden Island Property. August 1983.

Robbins, C. S., B. Brown, and H. S. Zim. Birds of North America. 2nd ed. (1983).

Siddall, J. L., K. L. Chambers, and D. H. Wagner. Rare, Threatened, and Endangered Vascular Plants in Oregon. 1979.

State of Washington, Office of Program Planning and Fiscal Management. 1972.

Stebbins, R. C. A Field Guide to Western Reptiles and Amphibians. 1966.

The Nature Conservancy. Rare, Threatened, and Endangered Plants and Animals of Oregon. 1983.

U.S. Army Corps of Engineers. Flood Control and Allied Purposes in the Rivergate-North Portland Area. Multnomah County, Oregon. Alternative Plans of Development. 1974.

U.S. Army Corps of Engineers. Columbia and Lower Willamette River Maintenance and Completion of the 40-Foot Navigation Channel Downstream of Vancouver, Washington and Portland, Oregon. Final Environmental Impact Statement. 1975[a].

U.S. Army Corps of Engineers. Final Environmental Impact Statement Dredging of Oregon Slough, North Portland Harbor, Oregon. December 1975[b].

U.S. Army Corps of Engineers. Inventory of Riparian Habitats and Associated Wildlife Along Columbia and Snake Rivers. 1976.

U.S. Army Corps of Engineers. Final Environmental Impact Statement, Navigation Development at Bonneville Lock and Dam. March 1981.

U.S. Army Corps of Engineers. Final Environmental Impact Statement Port of Kalama Marine Industrial Park and Bulk Handling Facility. January 1982.

U.S. Army Corps of Engineers. Final Environmental Impact Statement Columbia River at the Mouth, Oregon and Washington Navigation Channel Improvement. 1983.

U.S. Environmental Protection Agency. STORET. January 1980-April 1984.

U.S. Fish and Wildlife Service. Ecological Services Manual (101-104 ESM). Division of Ecological Services. 1980.

Verts, B. J. Keys to the Mammals of Oregon. 2nd ed. (1978).

Washington Administrative Code Chapter 173, Division 60. September 1975.

Washington State Department of Ecology. Washington State Air Monitoring Data for 1983. June 1984.

Waterways Development Plan Study Team. Portland Metropolitan Area Waterways Development Plan. November 1980.

APPENDICES

APPENDIX A

Land Use Approvals

Appendix A-1

BEFORE THE BOARD OF COUNTY COMMISSIONERS

FOR MULTNOMAH COUNTY, OREGON

ORDINANCE NO. 333

An ordinance revising the Comprehensive Framework Plan Map redesignating that portion of Hayden Island west of the Burlington Northern railroad, from "Natural Resource Multiple Use Forestry" to "Urban" (PR 5-82).

Multnomah County ordains as follows:

SECTION I. FINDINGS AND CONCLUSIONS.

The Board finds and concludes:

A. The Oregon Ports Study (1980), the Port of Portland Marine Terminals Master Plan Study (1981), the Portland Metropolitan Area Waterways Development Plan (1981), and the report titled, "Proposed Amendment to the Multnomah County Comprehensive Plan for the West Hayden Island Area" (1981), demonstrate a compelling need for appropriate lands to be designated for marine industrial development in the Portland area.

B. West Hayden Island is the only major site in the Portland region with the necessary rail and deep water access for marine industrial development. The area contains sufficient acreage to accommodate a significant portion of the shortage of waterfront industrial property anticipated by the year 2000.

C. The western portion of Hayden Island is designated "Natural Resource, Multiple Use Forestry." This designation was applied in 1977 because the need for future urban use was not identified, and the area lacked urban support services. Forestry and agricultural activities are the primary uses permitted. The area is generally unsuitable for commercial forest use due to the low fertility of the soil. There are no adjacent agricultural uses.

D. The urban designation and urban uses surround this site to the north in Vancouver, to the south and west in the Port of Portland's Rivergate industrial area, and to the east on the rest of Hayden Island, which is fully developed for light industrial, residential and commercial uses.

E. Any long term environmental and recreational losses from urban use of this site will be identified and addressed in the Community Planning process for West Hayden Island, the Design Review process, and by meeting requirements of the Significant Environmental Concern (SEC) overlay zone. Buffer zones, open areas and other appropriate measures will be provided to preserve and maintain fish and wildlife habitats of the area, wherever possible.

F. The anticipated urban use of West Hayden Island will primarily be marine industrial. Full development of this area is expected to generate from 1400 - 2400 new jobs locally.

G. The primary responsibility for providing transportation and related facilities necessary for development, and for constructing infrastructure needed for development to occur is the responsibility of the owner/developer.

H. Prior to development, a traffic management study and program is required of the developer/owner to provide measures which could be taken to avoid overburdening the East Hayden Island road system, the I-5 Interchange, and North Portland roads. The program should include possible alternative public and private transit facilities.

The transportation program shall assure that transportation facilities (off-site as well as on-site), transit services, and transportation management measures and scheduling will be identified prior to the zone change. Mechanisms to provide this assurance will be identified in the Community Plan. These mechanisms may include performance bonds, renewable or revocable permits or other measures based upon initiation and continued implementation of the Hayden Island Transportation Program.

I. The Board concurs in the Findings and Conclusions of the Planning Commission adopted at its meeting of July 12, 1982, as Resolution #PR 5-82a.

J. The Comprehensive Framework Plan Map revision meets the requirement of Statewide Planning Goal 2 (Land Use Planning) and Goal 14 (Urbanization) for local Plan Map and Urban Growth Boundary revisions, as stated in the Findings and Conclusions adopted by the Planning Commission on July 12, 1982.

K. Revising the Comprehensive Framework Plan Map for the western portion of Hayden Island meets Comprehensive Framework Plan Policies Nos. 1, 2, 5, 6, 12, 13, 15, 17, 18, 30, 32-34, 37, and 38, as described in the Findings and Conclusions adopted by the Planning Commission.

L. Requirements of Comprehensive Framework Plan Policies Nos. 2, 14, 16, and 35, will be met during the Community Planning process for West Hayden Island.

SECTION II. REVISION.

A. The Comprehensive Framework Plan Map, revised in July, 1980, is hereby revised to redesignate the western portion of Hayden Island from "Natural Resource, Multiple Use Forestry," to "Urban," in accord with the attached plan map, which is hereby adopted.

B. This Section shall take effect upon the Metropolitan Service District's decision to include that portion of Hayden Island west of the Burlington Northern railroad into the regional Urban Growth Boundary.

ADOPTION

This ordinance being necessary for the health, safety and general welfare of the people of Multnomah County, shall take effect on September 9, 1982, according to Section 5.50 of the Charter of Multnomah County.

ADOPTED this 10th day of August, 1982, being the date of its second reading before the Board of County Commissioners of Multnomah County, Oregon

FOR THE BOARD OF COUNTY COMMISSIONERS
OF MULTNOMAH COUNTY, OREGON

(SEAL)

By _____
Presiding Officer

Authenticated by the County Executive on the 12th day of August, 1982.

_____
DONALD E. CLARK, County Executive

APPROVED AS TO FORM:

JOHN B. LEAHY
County Counsel for
Multnomah County, Oregon

By _____
Laurence Kressel
Deputy County Counsel

Appendix A-1

BEFORE THE BOARD OF COUNTY COMMISSIONERS

FOR MULTNOMAH COUNTY, OREGON

ORDINANCE NO. 334

An ordinance revising the Hayden Island Plan to add Growth Management Policies for that portion of Hayden Island west of the Burlington Northern railroad.

Multnomah County ordains as follows:

SECTION I. FINDINGS AND CONCLUSIONS.

The board finds and concludes:

A. For the reasons stated in the Findings and Conclusions of the Decision PR 5-82, dated July 12, 1982 (Attachment A), and in the Introduction, Introduction, Section II below, that there is a need to revise the Hayden Island Plan to add interim policies to serve in the development of a more detailed Community Plan for the western portion of Hayden Island.

B. The Hayden Island Plan was prepared prior to inclusion of the western portion of Hayden Island into the regional Urban Growth Boundary.

SECTION II. REVISION.

A. The Hayden Island Plan is hereby revised by adding the following to Page 1:

"5. Western Hayden Island Growth Management Policies, to serve as interim policies in the development of a detailed Community Plan for that portion of Hayden Island located on the west side of the Burlington Northern railroad."

B. The Hayden Island Plan is hereby revised by adding the following Policy Area 9:

"INTRODUCTION

To implement County Framework Plan policies concerning the marine transportation system and the urban area, an adequate amount of suitable land to meet regional needs for marine development must be available. It should be adjacent to the shipping channels and served by rail. Based on analysis of the supply and demand for future marine development in the Portland region, the only major

area which meets these needs is West Hayden Island. The two major constraints to development which must be solved are improvements to the trafficways and other infrastructure serving the area; and a major filling and site preparation program.

These activities require significant facilities planning and financial commitment. Unless new governmental resources can be developed, it appears that private financing of these improvements will be required. Many of the development costs will not be incurred for five to ten years. Future governmental resources or policies cannot be predicted.

The objectives of West Hayden Island Urban Land Area and Growth Management Interim Policies are to establish policies consistent with Comprehensive Framework Plan Policy 6 regarding the urban land area and to guide the future Community Plan process for the area.

The purposes of growth management in Multnomah County are to:

- PROVIDE FOR ORDERLY GROWTH THAT IS STAGED over time, recognizing the constraints of the natural resource base, and the need for development to occur in concurrence with the provision of public services and facilities.

- DIRECT GROWTH INTO RELATIVELY COMPACT, identifiable attractive COMMUNITIES.

- IDENTIFY PUBLIC NEED and interest through the balancing of social, economic, physical, and environmental considerations; and

The Growth Management and Urban Land Area Policies in this Community Plan will be proposed for adoption as part of the future Community Plan for the area, and will be applied to specific future land use planning and development proposals, issues and decisions with respect to West Hayden Island. The following examples indicate how this process will function:

- In regard to major development constraints such as inadequate roadway capacity or requirements for off-site transportation improvements, development approvals (e.g., zone changes) will be staged by the County in accord with the private sector and/or the government's financial ability to provide needed services and facilities.

- Development of the West Hayden Island area will take place in an orderly manner as demonstrated need for land for marine industrial development is shown. The objective of this approach is to encourage a coordinated development pattern in order to use the land most efficiently and ensure that sufficient land is available at the appropriate time. This method also will help maintain undeveloped land in large parcels so that maximum alternatives with respect to size and location can be retained.

- The need to protect special environmental features such as wildlife habitat or natural shoreline will be balanced with development requirements. This is necessary to protect existing public and private investment in the community while helping maintain natural environmental resources and values, where possible.

WEST HAYDEN ISLAND URBAN LAND AREA POLICY

Comprehensive Framework Plan Policy 6, Urban Land Area Policy, applies to the western end of Hayden Island. Subject to approval of an Urban Growth Boundary amendment by the Metropolitan Service District, the Framework Plan map designation is changed from "Natural Resource Multiple Use Forestry" to "Urban," in accord with the attached map, which is hereby adopted. Further:

1. A Community Plan will be adopted in the future to designate appropriate urban uses, which will be primarily marine industrial, for West Hayden Island and to identify specific urban services and facilities which will be provided by the public and by private owners/developers.

2. The time schedule for development will be based on the requirements of the Growth Management Policy and Strategies.

WEST HAYDEN ISLAND GROWTH MANAGEMENT POLICY

It is the County's policy that land designated on Western Hayden Island as "Urban" will be reclassified to "Urban Immediate", upon Board Findings that:

1. A Community Plan and appropriate implementation measures have been adopted.

2. The following elements have been addressed in the Community Plan:

   A. There is a development program for West Hayden Island which ensures that facilities and services are provided in an orderly and economical manner. These include:

      - Site preparation and filling
      - Access roads
      - Railroads

- Sewers
- Water supply
- New underpass beneath the Burlington Northern railroad
- Private transit facilities
- New roadway bridge over Oregon Slough.

B A transportation study and program which identifies transportation management measures which could be implemented to avoid overburdening the East Hayden Island road system, the I-5 Interchange, and North Portland roads. This analysis should include potential traffic problems in the entire North Portland area peninsula. This analysis should also include possible alternative public and private transit facilities.

The transportation program shall assure that transportation facilities (off-site as well as on-site), transit services, and transportation management measures and scheduling will be identified prior to the zone change. Mechanisms to provide this assurance will be identified in the Community Plan. These mechanisms may include performance bonds, renewable or revocable permits or other measures based upon initiation and continued implementation of the Hayden Island Transportation Program.

C. Any environmental hazards, such as to fish and wildlife habitat or losses of recreational opportunities will be studied and addressed during the Community Planning process to minimize negative impacts from development. Buffer zones, open areas and other appropriate measures will be considered to preserve and maintain fish and wildlife habitat, in balance with economic and social benefits resulting from development.

3. Community Plan Policies, land use designations, urban services and implementing measures are, to the greatest extent practicable, consistent with Comprehensive Framework Plan Policies, Statewide Planning Goals, and other applicable laws and regulations.

4. The required services designated in the Community Plan can be provided in an orderly and efficient manner. The developer of the area assumes the primary obligation to obtain financing for constructing infrastructure and providing needed services.

5. If adverse impacts on the infrastructure or facilities outside the community are identified, the benefits to the public outweigh the detriments.

STRATEGIES

1. The County should prepare or have prepared a Community Plan for the western portion of Hayden Island. This could be combined with the existing Community Plan for the east end.

2. The County should expand and refine Urban Planning Area agreements and interagency coordination efforts concerning West Hayden Island, particularly regarding transportation system capacities and improvements, open space development, and expansion of the Portland harbor.

3. The County should provide continuous monitoring of potential grants and other funding sources to assist in the construction of needed capital improvements on West Hayden Island.

SECTION III. CONCURRENCE OF METROPOLITAN SERVICE DISTRICT REQUIRED.

This ordinance shall take effect upon the Metropolitan Service District's decision to include that portion of Hayden Island west of the Burlington Northern railroad into the regional Urban Growth Boundary.

ADOPTION

This ordinance being necessary for the health, safety and general welfare of the people of Multnomah County, shall take effect on September 9, 1982, according to Section 5.50 of the Charter of Multnomah County.

ADOPTED this 10th day of August, 1982, being the date of its second reading before the Board of County Commissioners of Multnomah County, Oregon.

(SEAL)

FOR THE BOARD OF COUNTY COMMISSIONERS
OF MULTNOMAH COUNTY, OREGON

By _____
Presiding Officer

Authenticated by the County Executive on the 12th day of August, 1982.

_____
DONALD E. CLARK, County Executive

APPROVED AS TO FORM:

JOHN B. LEAHY, County Counsel
for Multnomah County, Oregon

By _____
Laurence Kressel
Deputy County Counsel

Appendix A-1

BEFORE THE BOARD OF COUNTY COMMISSIONERS

FOR MULTNOMAH COUNTY, OREGON

ORDINANCE NO. 335

An ordinance amending the Comprehensive Framework Plan to add a Marine Transportation System Policy, No. 33A, as an addition to the existing Transportation System Policy, No. 33.

Multnomah County ordains as follows:

SECTION I. FINDINGS AND CONCLUSIONS.

The Board finds and concludes:

A. For the reasons stated in the Findings and Conclusions of the Decision PR 5-82, dated July 12, 1982 (Attachment A) and in Introduction, Section II, below, that there is a need to revise the Comprehensive Framework Plan text by adding provisions to consider and evaluate the needs and impacts of the Marine Transportation System.

B. The Comprehensive Framework Plan was prepared prior to completion of studies and forecasts concerning marine transportation needs and does not fully address the issue.

C. The Planning Commission considered the impacts and needs of the marine transportation system at a work session on June 28, 1982, and a public hearing on July 12, 1982, for which notice was duly given, and full opportunity for public testimony was afforded.

SECTION II. REVISION.

The Comprehensive Framework Plan is hereby revised by adding the following after Policy No. 33:

"INTRODUCTION.

The 40 foot Columbia River shipping channel is a federally funded, integral part of the national transportation system which has significant economic and social impact on the Portland region, Multnomah County, and the State of Oregon. In Multnomah County, the 40 foot channel extends from the north County line as it crosses Sauvie Island, upstream to the Interstate 5 freeway bridge.

"Requirements for land, docks and terminals, and rail and highway facilities to support the marine transportation system, vary according to the types of products and materials moved through the harbor. These include foreign cargoes such as grain, coal and autos, and domestic materials such as sand and gravel, and wood products. Another important activity is shipment of local products and goods to foreign markets through containers. Other significant waterfront activities dependent upon maintenance of the 40 foot channel and availability of suitable land are ship repair; marine construction, and private industries.

"A critical component of the marine system, which is part of the region's total transportation network, is sufficient, suitable and appropriately zoned land which can be served efficiently by rail and highway. If the system is to continue serving the region, all components, particularly suitable land, must be available.

"The Portland harbor and adjacent waterfront land depend upon a complex public/private partnership for continued success. The federal government is primarily responsible for navigation channel maintenance and improvements, while the Port of Portland owns and operates public marine terminals. The private sector provides for special facilities such as docks and facilities which handle major commodities, such as grain and wood chips, and towboat, barge, rail, ship and salvage services. Local jurisdictions generally are responsible for land use regulations, streets and public utilities. State and federal aid has been available for major highways.

"The purpose of this policy is to ensure that Multnomah County takes appropriate action to provide for needed marine transportation system facilities in those areas of the Portland region within its jurisdiction. The system must include appropriate backup land for marine terminal and waterfront industrial facilities.

"33A. MARINE TRANSPORTATION SYSTEM.

THE COUNTY'S POLICY IS TO IDENTIFY, EVALUATE AND ENCOURAGE THE DEVELOPMENT OF SUFFICIENT NEEDED PORT AND MARINE FACILITIES. PROVISIONS WILL BE MADE TO:

A. INVENTORY THE ACREAGE AVAILABLE FOR MARINE TERMINAL FACILITIES AND DETERMINE IF MORE LAND IS NEEDED, IN ACCORD WITH COUNTY FRAMEWORK POLICY 6.

B. EXPLORE THE CONCEPT OF A JOINT PUBLIC/PRIVATE PARTNERSHIP, INCLUDING COOPERATION WITH OTHER GOVERNMENTAL AGENCIES, TO FINANCE INFRASTRUCTURE IN ACCORD WITH COUNTY FRAMEWORK POLICY 4. HOWEVER, IT IS THE PRIMARY RESPONSIBILITY OF THE PROPERTY OWNER/DEVELOPER TO PROVIDE THE INFRASTRUCTURE NECESSARY TO SUPPORT DEVELOPMENT.

"C. ENCOURAGE IMPROVEMENTS TO PUBLIC AND PRIVATE ELEMENTS OF THE PORTLAND AREA HARBOR WHICH SUPPORT REGIONAL ECONOMIC DEVELOPMENT AND DIVERSITY, IN ACCORD WITH COUNTY FRAMEWORK POLICY 5."

"STRATEGIES.

A. As a part of its ongoing planning program, the County should consider the need for marine terminal facilities and suitable future land.

B. Based on its review of information on future needs for port facilities, the County should support appropriate action so that the required land will be available."

C. Protecting the rights and privileges of recreational boaters should be considered in the County's updating of the Framework Plan through Policy No. 39, (Open Space and Recreation).

ADOPTION

This Ordinance being necessary for the health, safety and general welfare of the people of Multnomah County, shall take effect on September 9, 1982, according to Section 5.50 of the Charter of Multnomah County.

ADOPTED this 10th day of August, 1982, being the date of its second reading before the Board of County Commissioners of Multnomah County, Oregon.

(SEAL)

FOR THE BOARD OF COUNTY COMMISSIONERS
OF MULTNOMAH COUNTY, OREGON

By _____
Presiding Officer

Authenticated by the County Executive on the 12th day of August, 1982.

_____
DONALD E. CLARK, County Executive

APPROVED AS TO FORM:

JOHN B. LEAHY, County Counsel
for Multnomah County, Oregon

By _____
Laurence Kressel
Deputy County Counsel

Appendix A-2

Note: Additions recommended by staff are underlined; deletions recommended are shown in brackets.

File:

BEFORE THE COUNCIL OF THE
METROPOLITAN SERVICE ~~DISTRICT~~

FOR THE PURPOSE OF ESTABLISHING PROCEDURES FOR LOCATIONAL ADJUSTMENTS TO METRO'S URBAN GROWTH BOUNDARY	))))	ORDINANCE NO. 81-105 Introduced by the Regional ~~Planning~~ Committee

THE COUNCIL OF THE METROPOLITAN SERVICE DISTRICT HEREBY ORDAINS:

Section 1. Purpose

(a) It is the purpose of this ordinance to establish procedures to be used by the District in making minor amendments to [amending] the District Urban Growth Boundary (UGB) adopted pursuant to ORS 268.390 (3) and 197.005 to 197.430. Procedures for District UGB amendments that add or remove more than fifty acres of land and for consideration of petitions that otherwise do not meet the standards provided in Section 8 of this ordinance will be adopted by separate ordinance.

(b) This ordinance is intended to incorporate relevant portions of Statewide Goal #14, and, by restricting the size and character of UGB adjustments that may be approved under this ordinance, this ordinance obviates the need to specifically apply the provisions of Goal #14 to UGB amendments approved hereunder.

[(b)] (c) Procedural provisions of this ordinance are to be construed as directory rather than mandatory and minor procedural deviations from this ordinance shall not constitute grounds for invalidating District actions taken under this ordinance.

[Section 2. Findings]

Section 2. [3.] Definitions

(a) "UGB" means the District Urban Growth Boundary adopted pursuant to ORS 268.390 and 197.005 to 197.430.

(b) "District" means the Metropolitan Service District.

(c) "Council" means the Council of the Metropolitan Service District.

(d) "Goals" means the statewide planning Goals adopted by the Oregon Land Conservation and Development Commission at OAR 660-15-000.

(e) "Petition" means a petition to amend the UGB.

(f) "Property owner" means a person who owns a legal interest in the property.

(g) "Legal Description" means a written description which appears on the UGB map as adopted by the Council or a written description from which the adopted map was drafted or which was adopted by Metro or its predecessor CRAG to describe the mapped UGB.

(h) "Locational Adjustment" means an amendment to the District UGB which includes the net addition or deletion of 50 acres or less and which is otherwise consistent with the standards indicated in Section 8 of this ordinance.

Section 3. Administrative Interpretation of the UGB

(a) When the UGB map and the legal description of the UGB are found to be inconsistent, the Executive Officer is hereby authorized to determine and interpret whether the map or the legal description correctly establishes the UGB location as adopted and to correct the map or description if necessary. In determining where the adopted UGB is located, the Executive Officer shall review the record to

determine legislative intent and shall seek a legal opinion from the District General Counsel. The map location should be preferred over the legal description in absence of clear evidence to the contrary.

(b) A city, county or special district whose municipal or planning area boundary includes the property, or a property owner who would be included or excluded from the urban area depending on whether the map or legal description controls, may request that the Executive Officer render an interpretation under this section. If the request is submitted in writing, the Executive Officer shall make the requested interpretation within 60 days after the request is submitted.

(c) Within ten days of rendering the interpretation, the Executive Officer shall provide a written notice and explanation of his decision to each city or county whose municipal or planning area boundaries include the area affected, owners of property in the area affected, and the Council.

(d) Any party eligible to request an interpretation under subsection (b) may petition the Council under subsection (e) of this section for a determination of where the UGB is located if that party disagrees with the Executive Officer's interpretation or if the Executive Officer fails to render an interpretation requested under subsection (b).

(e) Petitions for a Council determination of the location of the UGB under this section shall be treated as a petition for declaratory ruling. Petitions shall be submitted and decided in accordance with Code chapter 5.03 and not as a petition for locational adjustment under Sections 4 through 16 of this ordinance.

Section 4 [5]. Petitions Generally

(a) All petitions filed pursuant to this ordinance for amendment of the UGB must include a completed petition on a form provided by the District. Petitions which do not include the appropriate completed form provided by the District will not be considered for approval. Petitions filed after July 1 of each year shall not be accepted for consideration during that calendar year [unless the Council extends the deadline]. The District will determine not later than one week after the July 1 deadline for receipt of petitions whether the petition is complete and notify the petitioner. If the petitioner is notified that the petition is not complete, the petition must be completed and refiled within two weeks of notification or [before] by July 1, whichever is later, to be considered in that calendar year.

(b) No petition will be accepted under this ordinance if the proposed amendment to the UGB would result in a UGB not contiguous to the existing UGB.

(c) No petition to add or remove more than fifty acres of land in one location will be accepted under this ordinance.

Section 5 [6]. Local Position on Petition

(a) Except as provided in [paragraph] subsection (b) of this section, a petition shall not be accepted and shall not be considered a completed petition under Section 4 unless the petition includes a written action by the governing body of [the] each city or county with jurisdiction over the areas included in the petition which [results in]:

(1) [a recommendation] recommends that Metro approve the

petition; or

(2) [a recommendation] recommends that Metro deny the petition; or

(3) [an expression of] expresses no opinion on the petition.

(b) The requirement of paragraph (a) of this section shall be waived if the applicant [submits evidence] shows that a recommendation from the governing body was requested one year or more before the petition was filed with the District and that the governing body has not reached a decision on that request.

(c) If a city or county holds a public hearing to establish its position on a petition, the city or county [shall] should:

(1) provide notice of such hearing to the District and to any city or county whose municipal boundaries or urban planning area boundary abuts the area affected; and

(2) provide the District with a list of the names and addresses of parties testifying at the hearing and copies of any exhibits or written testimony submitted for the hearing.

Section 6 [7]. Local Action to Conform to District Boundary

(a) A city or county may, in addition to the action required in Section [6]5, approve a plan or zone change [for urban use] to implement the proposed adjustment in the area included in a petition prior to an amendment of the District UGB if:

(1) The District is given notice of the local action,

(2) The notice of the local action states that the local action is contingent upon subsequent action by the District to amend its UGB, and

(3) The local action to amend the local plan or zoning map [only] becomes effective only if the District [takes the required action to approve the UGB] amends the UGB consistent with the local action.

(b) If the city or county has not contingently amended its plan or zoning map to allow the use proposed in a petition, and if the District does approve the UGB amendment, the local plan or map change shall be changed to be consistent with the UGB amendment. That change shall be made at the next regularly scheduled plan or zoning map [amendment] review or within 1 year, whichever comes first.

Section 7 [10]. Standing to Petition for Amendment

(a) A petition may be filed by a county with jurisdiction over the property, a city with a planning area that includes or is contiguous to the property, the owners of the property included in the petition or a group of property owners who own not less than 50 percent of the property in each area included in the petition.

(b) Petitions to extend the UGB to include land outside the District [municipal boundary] shall not be accepted unless accompanied by:

(1) A copy of a petition for annexation to the [Metropolitan Service] District to be submitted to the Portland Metropolitan Area Local Government Boundary Commission pursuant to ORS chapter 199; and

(2) A statement of intent to file the petition for annexation within ninety (90) days of Metro action to approve the petition for UGB amendment, under Section 15(d) of this ordinance.

(c) The Council may at any time, on its own initiative, or upon the request of the Executive Officer, consider [an amendment of] a locational adjustment to the UGB without [submitting a] petition.

Section 8 [4]. Standards for Petition Approval

(a) As required by subsections (b) through (e) of this section, the following factors shall be considered in making locational adjustments under this ordinance:

(1) Orderly and Economic provision of public facilities and services. A locational adjustment should facilitate orderly and economic provision of public facilities and services, including but not limited to, water, sewerage, storm drainage, transportation, fire protection and schools. In addition to improving facilities and services efficiency in the adjoining areas within the UGB, any area to be added must be capable of being served in an orderly and economical fashion.

(2) Maximum efficiency of land uses. Considerations shall include existing development densities [on adjacent urban lands and] on the area included within the amendment, and whether the amendment would facilitate needed development on adjacent existing urban land.

(3) Environmental, energy, economic and social consequences. The impact on regional transit corridor development and any limitations imposed by

the presence of hazard or resource lands must be addressed.

(4) Retention of agricultural land. When a petition includes land with Class I - IV Soils that is not committed to non-farm use, the petition shall not be approved unless the existing location of the UGB is found to have severe negative impacts on land use or service efficiencies in that area and it is found to be impractical to ameliorate those negative impacts except by means of the adjustment requested. [If an area is zoned EFU or contains Class I through IV Soils, and an exception has not been approved by LCDC, the Goal #2 requirements for an exception to Goal #3 must be met.]

(5) Compatibility of proposed urban uses with nearby agricultural activities.

(b) Petitions to remove land from the UGB may be approved under the following conditions:

(1) Consideration of the factors in subsection (a) of this section demonstrate that it is appropriate that the land be excluded from the UGB.

(2) The land is not needed to avoid short-term land shortages for the District or for the county in which the affected area is located and any long-term land shortage that may result can reasonably be expected to be alleviated through addition of land in an appropriate location elsewhere in the region.

(3) Removals [shall] should not be granted if existing or planned capacity of major facilities such as sewerage, water and arterial streets will thereby be significantly underutilized.

(c) A petition to both remove land from the UGB in one location and extend the UGB in another location [shall] may be approved under the following conditions:

(1) The land removed from the UGB [shall] meets the conditions for removal in subsection (b) of this section.

(2) Consideration of the factors in subsection (a) of this section demonstrate that it is appropriate that the land to be added should be included within the UGB.

[(3) If, in considering factor one of subsection (a), the petitioner fails to demonstrate that existing or planned public services and facilities can adequately serve the property to be added to the UGB without upgrading or expanding the capacity of those facilities or services, the petition shall not be approved absent a showing of unusual circumstances.]

(3)[(4)] The net amount of vacant land added or removed as a result of a petition under this subsection shall not exceed 10 acres. Any area in addition to a 10 acre net addition must be identified and justified under the standards for an addition under subsection (d) of this [ordinance] section.

(4) [(5)] The larger the total area involved, the greater [must be] the difference should be between the relative suitability of the land to be added and the land to be removed based on consideration of the factors in subsection (a).

(d) Petitions to add land to the UGB may be approved under the following conditions:

(1) [A minor] An addition of land to make the UGB coterminous with the nearest property lines may be approved without consideration of the other conditions in this subsection if the adjustment will add a total of two acres or less, the adjustment would not be clearly inconsistent with any of the factors in subsection (a) and the adjustment includes all [adjoining] contiguous lots [properties split] divided by the existing UGB.

(2) For all other [minor] additions, the proposed UGB must be superior to the UGB as presently located[,] based on a consideration of the factors in subsection (a). The minor addition must include all similarly situated contiguous land which could also be appropriately included within the UGB as [a minor] an addition based on the factors in subsection (a).

(3) [Minor] Additions shall not add more than fifty acres of land to the UGB and generally should not add more than 10 acres of vacant land to the UGB. [The burden

of proof for an adjustment that would add more than 10 acres of vacant land to the UGB shall increase with the size of the parcel to be added.] Except as provided in subsection (4) of this subsection, the larger the proposed addition, the greater the differences should be between the suitablity of the proposed UGB and suitability of the existing UGB, based upon consideration of the factors in subsection (a) of this section.

(4) If an addition is requested in order to remedy an alleged mistake made at the time the UGB for the area affected was adopted, the addition may be approved if all of the following conditions are met.

A There is clear evidence in the record of specific legislative intent to place the UGB in the particular location requested.

B The petition for an addition to remedy an alleged mistake is filed by July 1, 1982 or within two years from the time the UGB for the area affected was adopted, whichever is later.

C The addition is consistent with the factors in subsection (a) of this section and does not add more than 50 acres of land.

[(e) Corrections to add or remove land from the UGB may be approved under the following conditions:]

[(1) The legal description and the map location of the boundary do not agree or there is a clear record of

legislative intent to place the UGB in a specific location which differs from that indicated by the legal description and map.]

[(2) A petition for correction under this subsection shall not be accepted if the mapping or legal description error to be corrected by the petition occurred more than two years before the petition is submitted. For purposes of this two year limitation, if the error occurred before November 8, 1979, a petition for correction may be submitted until November 8, 1981.]

[(3) In making a correction one of the following procedures shall be followed:]

[A If the legislative intent is clear, it shall be followed unless more than 10 vacant acres would be added to the UGB or the area to be added is clearly inconsistent with the factors in subsection (a).]

[B Where the legislative intent is not clear, the map location shall be preferred unless it is shown to be clearly inconsistent with one or more of the factors in subsection (a).]

[C In all cases where the procedures in subsections (A) or (B) of this subsection are not applicable, the UGB shall be established in the location that best satisfies the factors in subsection (a) provided that the corrected UGB shall not exceed that indicated by the map,

legal description or legislative intent except to include small portions of tax lots which would otherwise be divided. The new boundary shall not include so much additional vacant land as to significantly affect the region's growth capacity.]

Section 9 [8]. Notice of Filing Deadline

The District shall give notice of the July 1 deadline for acceptance of petitions for UGB amendments under this ordinance not less than 90 days before the deadline and again 20 days before the deadline in a newspaper of general circulation in the District. The notice shall briefly explain the consequences of failing to file before the deadline and shall specify the District officer or employee from whom additional information may be obtained.

Section 10 [9]. Filing Fee

Each [All] petition[s] submitted [pursuant to this ordinance] by a property owner[s] or group[s] of property owners pursuant to this ordinance shall be accompanied by a filing fee in an amount to be established by resolution of the Council.

Section 11. Notice of UGB Adjustment Hearing

(a) The notice provisions established by this section shall be followed in UGB hearings on petitions for UGB adjustments. These notice provisions shall be in addition to the District notice provisions for contested case hearings contained in the District Code Section 5.02.005.

(b) [(a)] Notice of public hearing shall include:

1. The time, date and place of the hearing.

2. A description of the property reasonably calculated to give notice as to its actual location.

3. A summary of the proposed action.

4. Notice that interested persons may submit written comments at the hearing and appear and be heard.

5. Notice that the hearing will be conducted pursuant to District rules for contested cases.

(c) [(b)] Not more than 20 nor less than 10 days before the hearing, notice shall be mailed to the following persons:

1. The petitioner(s).

2. All property owners of record within 250 feet of the property subject to petition. For purposes of this subsection, only those property owners of record within 250 feet of the subject property as determined from the maps and records in the county departments of taxation and assessment are entitled to notice by mail. Failure of a property owner to receive actual notice will not invalidate the action if there was a reasonable effort to notify record owners.

3. All cities and counties in the District and affected agencies as determined by the Executive Officer.

(c) Notice shall be published in a newspaper of general circulation in the District not more than twenty (20) nor less than ten (10) days prior to the hearing.

(d) The hearing may be continued without additional notice [as determined by the hearings officer].

Section 12. Hearing

(a) [Prior to Council action to amend the UGB, at least one public hearing on the proposed action shall be held. If the action is legislative in nature, the hearing shall be before the Council or designated Council Committee and shall be conducted pursuant to procedures established by the Council for legislative hearings. If the hearing is quasi-judicial,] All petitions accepted under this ordinance shall receive a contested case hearing. The hearing shall be conducted by a hearings officer pursuant to District procedures for contested cases contained in District Code chapter 5.02.

(b) Proposed UGB amendments may be consolidated by the hearings officer or presiding officer for [contested case] hearings where appropriate.

(c) [At a contested case hearing] The proponent of a proposed UGB amendent shall have the burden of proving that the proposed amendment complies with the applicable standards [adopted by the District] in this ordinance.

[Section 13. Legislative or Quasi-Judicial Hearing

All petitions shall receive a quasi-judicial hearing. When the Council or Executive Officer initiate consideration of a UGB amendment, the District General Counsel shall determine and advise the Council whether the proposed amendment may be given a quasi-judicial or legislative hearing.]

Section [14] 13. Staff Review and Report

All petitions shall be reviewed by District staff and a report and recommendation submitted to the Hearings Officer or the Council not less than five (5) days before the required hearing [to the

Council or the Hearings Officer]. A copy of the staff report and recommendation shall simultaneously be sent to the petitioner(s) and others who have requested copies.

Section [15] 14. Council Action on Petitions

(a) Following public hearings on all petitions for UGB changes, the Council shall act to approve or deny the petitions in whole or in part or approve the petitions as modified.

(b) Final Council action following a quasi-judicial hearing shall be as provided in [District] Code section 5.02.045. Parties shall be notified of their right to review before the Land Use Board of Appeals pursuant to 1979 Oregon Laws, ch 772.

(c) Final Council action following a legislative hearing shall be by ordinance.

(d) When the Council acts to approve in whole or in part a petition affecting land outside the District:

(1) Such action shall be by resolution expressing intent to amend the UGB if and when the affected property is annexed to the District within six months of the date of adoption of the Resolution.

(2) The Council shall take final action, as provided for in paragraphs (b) and (c) of this section, [to amend the UGB] within thirty (30) days of notice from the Boundary Commission that annexation to the District has been approved.

Section [16] 15. Notice of District Action

The District shall give each county and city in the District notice of [the] each amendment of the UGB. Such notice shall include a statement of the local action that will be required to make local plans consistent with the amended UGB and the date by

which that action must be taken.

Section [17] 16. Review of Procedures

(a) These procedures are designed for small adjustments to the UGB which generally should not, in total, result in a net addition to or removal of more than 2,000 acres of urban land over the next twenty years.

(b) If, at any time after December 31, 1983, the total net change in the size of the urban area is greater than an average net addition or removal of 100 acres [a] per year, the District shall either amend this ordinance to change the [circumstances in] standards under which petitions may be approved or adopt findings demonstrating why such ordinance amendment is not necessary to ensure continued compliance with [Goal #14] the Statewide Goals.

(c) The District action provided for in paragraph (b) of this section shall occur before any additional UGB amendments are approved.

Section 17. LCDC Acknowledgment

This ordinance shall be submitted upon adoption to the Land Conservation and Development Commission for acknowledgment pursuant to ORS 197.251, as an implementing measure to the District UGB.

ADOPTED by the Council of the Metropolitan Service District this _____ day of _____, 19__.

_____
Presiding Officer

ATTEST:

_____
Clerk of the Council

JH:gl
1896B/204

APPENDIX B

Physical Environment

Appendix B-1

SOIL CLASSIFICATION AND CHARACTERISTICS

Classification	Acreage	Percent Slope	Drainage	Permeability	Erosion Potential	Uses
Faloma Silt Loam (10A)	6	0-3	Poor	Moderately Rapid	High	Wildlife habitat; recreation; urban (if diked and drained)
Sauvie Silt Loam (26A)	22	0-2	Poor	Moderately Slow	High due to flooding	Hay; pasture; recreation; wildlife habitat
Sauvie Silt Clay Loam (28A)	177					
Rafton Silt Loam (30A)	41	0-2	Very Poor	Moderate	Slight	Hay; pasture; truck crops; wildlife habitat
Pilchuck Sand (18A)	394	0-3	Excessive	Very Rapid	High due to flooding	Pasture; recreation; wildlife habitat
Pilchuck Sand Protected (19A)	87					
Pilchuck Urban Land Complex (48A)	34					

Source: U.S. Soil Conservation Service.

TABLE 1
AIR CONTAMINANT SOURCES AND
ASSOCIATED FEE SCHEDULE

(340-20-155)

NOTE: Persons who operate boilers shall include fees as indicated in Items 58, 59, or 60 in addition to fee for other applicable category.

Air Contaminant Source	Standard Industrial Classification Number	Filing Fee	Application Processing Fee	Annual Compliance Determination Fee	Fees to be Submitted with New Application	Fees to be Submitted with Renewal Application	Fees to be Submitted with Application to Modify Permit
1. Seed cleaning located in special control areas, commercial operations only (not elsewhere included)	0723	75	100	190	365	265	175
2. Smoke houses with 5 or more employees	2013	75	100	135	310	210	175
3. Flour and other grain mill products in special control areas	2041						
a) 10,000 or more t/y		75	325	375	775	450	400
b) Less than 10,000 t/y		75	250	160	485	235	325
4. Cereal preparations in special control areas	2043	75	325	270	670	345	400
5. Blended and prepared flour in special control areas	2045						
a) 10,000 or more t/y		75	325	270	670	345	400
b) Less than 10,000 t/y		75	250	135	460	210	325
6. Prepared feeds for animals and fowl in special control areas	2048						
a) 10,000 or more t/y		75	325	375	775	450	400
b) Less than 10,000 t/y		75	200	295	570	370	275

OA2308.B1 02/03/83

TABLE 1 Continued (340-20-155)

NOTE: Persons who operate boilers shall include fees as indicated in Items 58, 59, or 60 in addition to fees for other applicable category.

Air Contaminant Source	Standard Industrial Classification Number	Filing Fee	Application Processing Fee	Annual Compliance Determination Fee	Fees to be Submitted with New Application	Fees to be Submitted with Renewal Application	Fees to be Submitted with Application to Modify Permit
7. Beet sugar manufacturing	2063	75	425	1860	2360	1935	500
8. Rendering plants	2077						
a) 10,000 or more t/y		75	250	460	785	535	325
b) Less than 10,000 t/y		75	250	270	595	345	325
9. Coffee roasting	2095	75	200	245	520	320	275
10. Sawmill and/or planing	2421						
a) 25,000 or more bd.ft./shift		75	200	375	650	450	275
b) Less than 25,000 bd.ft./shift		75	75	270	420	345	150
11. Hardwood mills	2426	75	75	245	395	320	150
12. Shake and shingle mills	2429	75	75	295	445	370	150
13. Mill work with 10 employees or more	2431	75	150	295	520	370	225
14. Plywood manufacturing	2435 & 2436						
a) Greater than 25,000 sq.ft./hr, 3/8" basis		75	625	755	1455	830	700
b) Less than 25,000 sq.ft./hr, 3/8" basis		75	450	510	1035	585	525
15. Veneer manufacturing only (not elsewhere included)	2435 & 2436	75	100	270	445	345	175
16. Wood preserving	2491	75	150	270	495	345	225
17. Particleboard manufacturing	2492	75	625	890	1590	965	700

OA2308.B1 02/03/83

TABLE 1 Continued (340-20-155)

NOTE: Persons who operate boilers shall include fees as indicated in Items 58, 59 or 60 in addition to fees for other applicable category.

Air Contaminant Source	Standard Industrial Classification Number	Filing Fee	Application Processing Fee	Annual Compliance Determination Fee	Fees to be Submitted with New Application	Fees to be Submitted with Renewal Application	Fees to be Submitted with Application to Modify Permit
18. Hardboard manufacturing	2499	75	625	730	1430	805	700
19. Battery separator mfg.	2499	75	100	540	715	615	175
20. Furniture and fixtures	2511						
a) 100 or more employees		75	200	375	650	450	275
b) 10 employees or more but less than 100 employees		75	125	245	445	320	200
21. Pulp mills, paper mills, and paperboard mills	2611 2621 2631	75	1250	3235	4560	3310	1325
22. Building paper and building-board mills	2661	75	200	245	520	320	275
23. Alkalies and chlorine mfg.	2812	75	350	685	1070	720	425
24. Calcium carbide manufacturing	2819	75	375	685	1095	720	450
25. Nitric acid manufacturing	2819	75	250	325	650	400	325
26. Ammonia manufacturing	2819	75	250	375	700	450	325
27. Industrial inorganic and organic chemicals manufacturing (not elsewhere included)	2819	75	325	460	860	535	400
28. Synthetic resin manufacturing	2819	75	250	375	700	450	325
29. Charcoal manufacturing	2861	75	350	780	1205	855	425
30. Herbicide manufacturing	2879	75	625	3235	3935	3310	700

OA2308.B1 02/03/83

TABLE 1 Continued (340-20-155)

NOTE: Persons who operate boilers shall include fees as indicated in Items 58, 59 or 60 in addition to fees for other applicable category.

Air Contaminant Source	Standard Industrial Classification Number	Filing Fee	Application Processing Fee	Annual Compliance Determination Fee	Fees to be Submitted with New Application	Fees to be Submitted with Renewal Application	Fees to be Submitted with Application to Modify Permit
31. Petroleum refining	2911	75	1250	3235	4560	3310	1325
32. Asphalt production by distillation	2951	75	250	375	700	450	325
33. Asphalt blowing plants	2951	75	250	485	810	560	325
34. Asphaltic concrete paving plants	2951						
a) Stationary		75	250	295	620	370	325
b) Portable		75	250	375	700	450	325
35. Asphalt felts and coating	2952	75	250	565	890	640	325
36. Blending, compounding, or refining of lubricating oils and greases	2992	75	225	350	650	825	300
37. Glass container manufacturing	3221	75	250	460	785	535	325
38. Cement manufacturing	3241	75	800	2370	3245	2485	875
39. Redimix concrete	3273	75	100	160	335	235	175
40. Lime manufacturing	3274	75	375	245	695	320	450
41. Gypsum products	3275	75	200	270	545	345	275
42. Rock crusher	3295						
a) Stationary		75	225	295	595	370	300
b) Portable		75	225	375	675	450	300

OA2308.B1 02/03/83

TABLE 1 Continued (340-20-155)

NOTE: Persons who operate boilers shall include fees as indicated in items 58, 59 or 60 in addition to fees for other applicable category.

Air Contaminant Source	Standard Industrial Classification Number	Filing Fee	Application Processing Fee	Annual Compliance Determination Fee	Fees to be Submitted with New Application	Fees to be Submitted with Renewal Application	Fees to be Submitted with Application to Modify Permit
43. Steel works, rolling and finishing mills, electrometallurgical products	3312 & 3313	75	625	645	1345	720	700
44. Incinerators							
a) 1000 lbs/hr and greater capacity		75	375	245	695	320	450
b) 500 lbs/hr to 1000 lbs/hr capacity		75	125	190	390	265	200
c) 40 lbs/hr to 500 lbs/hr capacity pathological waste only		75	125	190	390	265	200
45. Gray iron and steel foundries	3321						
Malleable iron foundries	3322						
Steel investment foundries	3324						
Steel foundries (not elsewhere classified)	3325						
a) 3,500 or more t/y production		75	625	565	1265	640	700
b) Less than 3,500 t/y production		75	150	295	520	370	225
46. Primary aluminum production	3334	75	1250	3235	4560	3310	1325
47. Primary smelting of zirconium or hafnium	3339	75	6250	3235	9560	3310	6325

OA2308.B1 02/03/83

TABLE 1 Continued (340-20-155)

NOTE: Persons who operate boilers shall include fees as indicated in Items 58, 59 or 60 in addition to fees for other applicable category.

Air Contaminant Source	Standard Industrial Classification Number	Filing Fee	Application Processing Fee	Annual Compliance Determination Fee	Fees to be Submitted with New Applications	Fees to be Submitted with Renewal Application	Fees to be Submitted with Application to Modify Permit
48. Primary smelting and refining of ferrous and nonferrous metals (not elsewhere classified)	3339						
a) 2,000 or more t/y production		75	625	1400	2100	1475	700
b) Less than 2,000 t/y production		75	125	540	740	615	200
49. Secondary smelting and refining of nonferrous metals	3341	75	300	375	750	450	375
50. Nonferrous metals foundries	3361 3362	75	150	325	550	400	225
51. Electroplating, polishing, and anodizing with 5 or more employees	3471	75	125	245	445	320	200
52. Galvanizing and pipe coating--exclude all other activities	3479	75	125	245	445	320	200
53. Battery manufacturing	3691	75	150	325	550	400	225
54. Grain elevators--intermediate storage only, located in special control areas	4221						
a) 20,000 or more t/y		75	225	510	810	585	300
b) Less than 20,000 t/y		75	125	245	445	320	200

TABLE 1 Continued (340-20-155)

NOTE: Persons who operate boilers shall include fees as indicated in Items 58, 59 or 60 in addition to fees for other applicable category

Air Contaminant Source	Standard Industrial Classification Number	Filing Fee	Application Processing Fee	Annual Compliance Determination Fee	Fees to be Submitted with New Application	Fees to be Submitted with Renewal Application	Fees to be Submitted with Application to Modify Permit
55. Electric power generation	4911*						
A) Wood or Coal Fired - Greater than 25MW		75	5000	3235	8310	3310	5075
B) Wood or Coal Fired - Less than 25 MW		75	3000	1615	4690	1690	3075
C) Oil Fired		75	450	780	1305	855	525
56. Gas production and/or mfg.	4925	75	475	375	925	450	550
57. Grain elevators--terminal elevators primarily engaged in buying and/or marketing grain--in special control areas	5153						
a) 20,000 or more t/y		75	625	645	1345	720	700
b) Less than 20,000 t/y		75	175	245	495	320	250
58. Fuel Burning equipment within the boundaries of the Portland, Eugene-Springfield and Medford-Ashland Air Quality Maintenance Areas and the Salem Urban Growth Area***	4961**	(Fees will be based on the total aggregate heat input of all boilers at the site)					
a) Residual or distillate oil fired 250 million or more btu/hr (heat input)		75	200	245	520	320	275
b) Residual or distillate oil fired, 10 or more but less than 250 million btu/hr (heat input)		75	125	135	335	210	200

OA2308.B1 02/03/83

TABLE 1 Continued (340-20-155)

NOTE: Persons who operate boilers shall include fees as indicated in Items 58, 59 or 60 in addition to fees for other applicable category.

Air Contaminant Source	Standard Industrial Classification Number	Filing Fee	Application Processing Fee	Annual Compliance Determination Fee	Fees to be Submitted with New Application	Fees to be Submitted with Renewal Application	Fees to be Submitted with Application to Modify Permit
59. Fuel burning equipment within the boundaries of the Portland, Eugene-Springfield and Medford-Ashland Air Quality Maintenance Areas and the Salem Urban Growth Area***	4961**						
a) Wood or coal fired, 35 million or more Btu/hr (heat input)		75	200	245	520	320	275
b) Wood or coal fired, less than 35 million Btu/hr (heat input)		75	50	135	260	210	125

*Excluding hydro-electric and nuclear generating projects, and limited to utilities.
**Including fuel burning equipment generating steam for process or for sale but excluding power generation (SIC 4911).
***Maps of these areas are attached. Legal descriptions are on file in the Department.

60. Fuel burning equipment outside the boundaries of the Portland, Eugene-Springfield and Medford-Ashland Air Quality Maintenance Areas and the Salem Urban Growth Area.	4961**	(Fees will be based on the total aggregate heat input of all boilers at the site.)					
All wood, coal and oil fired greater than 30 x 10^6 Btu/hr (heat input)		75	125	135	335	210	200

TABLE 1 Continued (340-20-155)

NOTE: Persons who operate boilers shall include fees as indicated in Items 58, 59 or 60 in addition to fees for other applicable category.

Air Contaminant Source	Standard Industrial Classification Number	Filing Fee	Application Processing Fee	Annual Compliance Determination Fee	Fees to be Submitted with New Application	Fees to be Submitted with Renewal Application	Fees to be Submitted with Application to Modify Permit
61. New sources not listed herein which would emit 10 or more tons per year of any air contaminants including but not limited to particulates, SO_2, or NO_x or hydrocarbons, if the source were to operate uncontrolled.							
a) Low cost		75	****	150	****	225	****
b) Medium cost		75	****	350	****	425	****
c) High cost		75	****	2000	****	2075	****
62. New sources not listed herein which would emit significant malodorous emissions, as determined by Departmental or Regional Authority review of sources which are known to have similar air contaminant emissions.							
a) Low cost		75	****	150	****	225	****
b) Medium cost		75	****	350	****	425	****
c) High cost		75	****	2000	****	2075	****
63. Existing sources not listed herein for which an air quality problem is identified by the Department or Regional Authority.							
a) Low cost		75	****	150	****	225	****
b) Medium cost		75	****	350	****	425	****
c) High cost		75	****	2000	****	2075	****

OA2308.B1 02/03/83

TABLE 1 Continued (340-20-155)

NOTE: Persons who operate boilers shall include fees as indicated in Items 58, 59 or 60 in addition to fees for other applicable category.

Air Contaminant Source	Standard Industrial Classification Number	Filing Fee	Application Processing Fee	Annual Compliance Determination Fee	Fees to be Submitted with New Application	Fees to be Submitted with Renewal Application	Fees to be Submitted with Application to Modify Permit
64. Bulk Gasoline Plants	5100 *****	75	55	160	290	235	130
65. Bulk Gasoline Terminals	5171 *****	75	1090	540	1615	615	1075
66. Liquid Storage Tanks, 39,000 gallons or more capacity, not elsewhere included	4200 *****	75	50/tank	110/tank			
67. Can Coating	3411*****	75	1500	970	2545	1045	1575
68. Paper Coating	2641 or 3861*****	75	1500	970	2545	1045	1575
69. Coating Flat Wood	2400*****	75	500	325	900	400	575
70. Surface Coating, Manufacturing	2500, 3300, 3400, 3500, 3600, 3700, 3800, 3900*****						
a) 5-20 tons VOC/yr		75	25	90	190	165	100
b) 20-100 tons VOC/yr		75	100	215	390	290	175
c) over 100 tons VOC/yr		75	500	430	1005	505	575
71. Flexographic or Rotogravure Printing over 60 tons VOC/yr per plant	2751, 2752*****	75	50/press	160/press			

TABLE 1 Continued (340-20-155)

NOTE: Persons who operate boilers shall include fees as indicated in Items 58, 59 or 60 in addition to fees for other applicable category.

Air Contaminant Source	Standard Industrial Classification Number	Filing Fee	Application Processing Fee	Annual Compliance Determination Fee	Fees to be Submitted with New Application	Fees to be Submitted with Renewal Application	Fee to be Submitted with Application to Modify Permit
72. New sources of VOC not listed herein which have the capacity or are allowed to emit 10 or more tons per year VOC	*****						
a) Low cost		75	****	150	****	225	****
b) Medium cost		75	****	350	****	425	****
c) High cost		75	****	2000	****	2075	****

****Sources required to obtain a permit under items 61, 62, 63 and 72 will be subject to the following fee schedule to be applied by the Department based upon the anticipated cost of processing.

Estimated Permit Cost	Application Processing Fee
Low cost	$100.00 - $250.00
Medium cost	$250.00 - $1500.00
High cost	$1500.00 - $3000.00

As nearly as possible, applicable fees shall be consistent with sources of similar complexity as listed in Table 1.

***** Permit for sources in categories 64 through 72 are required only if the source is located in the Portland AQMA, Medford-Ashland AQMA or Salem SATS.

Appendix B-3

AIR QUALITY

The following review of new source regulations primarily covers State of Oregon requirements. In general, Oregon requires that the best practical treatment and control of air containment emissions be provided. In addition, for new sources of emissions located in existing high air quality areas, the degree of control shall be such that air quality degradation is minimized.

For potential West Hayden Island sources, a written Notice of Construction will have to be submitted to the Oregon Department of Environmental Quality (DEQ) if sources have fuel, refuse or open burning equipment, air pollution control equipment, or process equipment. The new source construction is also subject to the approval of the Oregon Environmental Quality Commission. Depending upon the type of source and the potential emissions, the approval process may require preliminary or routine sampling, testing, and measurement of source emission.

Specific emission sources identified in Table 1 of OAR 340-20-155 are required to have an Air Contaminant Discharge Permit (ACDP) before source construction can begin. Within this table are sources such as grain elevators and liquid storage tanks; therefore, some of the new cargo-handling facilities established at West Hayden Island may require an ACDP. The permit process requires completing an ACDP application, which contains information regarding source, emissions, and control equipment.

For emission sources which are classified as "major", a New Source Review (NSR) is required. Major sources are defined as a stationary source which emits or has the potential to emit any pollutant at a "significant emission rate". These emission rates are described in Table A. It is possible that new emission sources located at West Hayden Island could fall under the NSR regulations. These regulations depend on the location of the source with respect to an attainment or nonattainment area. Since West Hayden Island is located in or near both types of area, both sets of regulations must be considered.

In an attainment area, the NSR will require the owner to provide information on the source's design, planned operation, pollutant emissions, and controls. The owner must also provide an air quality impact analysis of the source's potential emissions. This analysis should be supplemented by ambient air quality data collected by the owner for each pollutant which will exceed the significant emission rate, unless the air quality impact analysis shows that impacts are less than those listed in OAR 340-20-245(5)(C). Also, best available control technology is required for each of these significant emission rate pollutants. Finally, information and analysis results provided in this review process are subject to approval of DEQ and must be made available to the public for review, comments, and possible hearings.

There is a special exemption from the NSR process for emission sources which meet the requirements of not causing a significant impact on a nonattainment area, and complying with special source and emission restrictions. Emission restrictions involve sources that either emit less than 100 tons of potential emissions per year and are within the source type categories described in OAR 340-20-245(3) or are not within these categories but emit less than 250 tons of potential emissions per year. Within this source category list, only type (XXV), the petroleum storage and transfer units, would apply to potential sources located on West Hayden Island under present zoning.

A new major source must comply with additional restrictions to locate in a nonattainment area. These restrictions involve compliance with the lowest achievable emission rates, state compliance schedules, emission growth increments, and emission reductions (offsets). A new major source of volatile organic compounds (VOC) on West Hayden Island must perform an alternative analysis showing that source operation benefits outweigh social and environmental costs involved. These VOC sources will also be required to comply with special growth increment allocations for the Portland ozone nonattainment area.

Additional impact analyses and ambient monitoring may be required by DEQ as site-specific conditions require. These analyses address special problems such as impairment on visibility, soils, etc. Without additional information on new sources to be located on West Hayden Island, it is not possible to determine if additional analyses will be required.

Within the new source review, major sources are also subject to Prevention of Significant Deterioration (PSD) regulations. The PIAQMA airshed is classified Class II PSD area; therefore, increases in new source air quality impacts cannot exceed specific increments for the attainment pollutants. These allowable increases or increments are presented in Table B. For West Hayden Island, the attainment pollutants are all the pollutants listed in Table A as long as the new source does not cause a significant air quality impact within a local nonattained area. These significant impact levels are defined in Table C. The air quality modeling analysis required in the NSR provides predicted new source impacts to show if the new source will comply with PSD requirements.

All new sources which require an ACDP will also be required to establish a series of plant site emission limits (PSEL). The PSEL are specific emission limitations based on the new source's applicable control equipment requirements and projected operating conditions. The PSEL provides Oregon with a means of managing the air quality emissions for all permitted sources throughout the state. The PSEL are established for a new source during the processing of the source's ACDP.

Federal and state regulations require specific types of new stationary sources to comply with certain standards of performance related to air quality emissions. These new source performance standards (NSPS) are referenced by the State of Oregon in OAR 340-25-505 to 340-25-675 and

by the federal government in Title 40 Code of Federal Regulation, Part 60.

There are NSPS for liquid petroleum storage vessels. Since these source types may be located on West Hayden Island, all NSPS regulations should be carefully examined in planning new source growth.

Appendix B-3

Table A

SIGNIFICANT EMISSION RATES CRITERIA FOR MAJOR SOURCES

Pollutant	Significant Emission Rate (tons/year)
Carbon Monoxide	100.0
Nitrogen Oxides	40.0
Particulate Matter	25.0
Sulfur Dioxide	40.0
Volatile Organic Compounds	40.0
Lead	0.6
Mercury	0.1
Beryllium	0.0004
Asbestos	0.007
Vinyl Chloride	1.0
Fluorides	3.0
Sulfuric Acid Mist	7.0
Hydrogen Sulfide	10.0
Total Reduced Sulfur	10.0
Reduced Sulfur Compounds	10.0

Appendix B-3

Table B

PSD CLASS II INCREMENTS

Pollutant	Averaging Time	Increment
Total Suspended Particulate	Annual	19 mg/m^3
	24-Hour	37 mg/m^3
Sulfur Dioxide	Annual	20 mg/m^3
	24-Hour	91 mg/m^3
		512 mg/m^3

Table C

SIGNIFICANT AIR QUALITY IMPACTS

Pollutant	Averaging Time	Impact
Total Suspended Particulate	Annual	0.2 mg/m^3
	24-Hour	1.0 mg/m^3
Sulfur Dioxide	Annual	1.0 mg/m^3
	24-Hour	5.0 mg/m^3
	3-Hour	25.0 mg/m^3
Nitrogen Dioxide	Annual	1.0 mg/m^3
Carbon Dioxide	8-Hour	0.5 mg/m^3
	1-Hour	2.0 mg/m^3

Appendix B-4

1983 AMBIENT AIR QUALITY DATA IN HAYDEN ISLAND VICINITY

Pollutant	Averaging Period	Monitored Concentration Highest (mg/m^3)	Monitored Concentration Second Highest (mg/m^3)	Monitoring Name	Station Location
Particulate	Annual	51.0	NA*	Terminal 2	Vancouver, Washington
	24-Hour	153.0	147.0		
Ozone	1-Hour	115.0	110.0	Sauvie Island	Sauvie Island
Carbon Monoxide	8-Hour	12.1 mg/m^3	11.2 mg/m^3	CAMS	Downtown Portland
	1-Hour	16.1 mg/m^3	14.4 mg/m^3		
Sulfur Dioxide	Annual	18.3	NA	Central Fire Station	Downtown Portland
	24-Hour	67.0	NA		
	3-Hour	NA	NA		
Nitrogen Dioxide	Annual	32.6	NA	SE Lafayette	SE Portland
Lead	Calendar Quarter	0.27		Roosevelt High School	NW Portland

* NA - Not applicable or available.

Appendix B-5

FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal Standard		Oregon Standard
		Primary	Secondary	
Total Suspended Particulate	Annual Mean	75mg/m^3	60mg/m^3	60mg/m^3
	24-Hour	260mg/m^3	150mg/m^3	150mg/m^3
	Monthly	-	-	100mg/m^3
Ozone	1-Hour	235mg/m^3	235mg/m^3	235mg/m^3
Carbon Monoxide	8-Hour	10mg/m^3	10mg/m^3	10mg/m^3
	1-Hour	40mg/m^3	40mg/m^3	40mg/m^3
Sulfur Dioxide	Annual	80mg/m^3	-	60mg/m^3
	24-Hour	365mg/m^3	-	260mg/m^3
	3-Hour	-	1300mg/m^3	1300mg/m^3
Nitrogen Dioxide	Annual	100mg/m^3	100mg/m^3	100mg/m^3
Lead	Calendar Quarter	1.5mg/m^3	1.5mg/m^3	1.5mg/m^3

Appendix B-6

PIA PRECIPITATION STATISTICS: 1976-85
(All Amounts Are in Inches)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
1976	5.14	4.92	2.93	2.34	2.29	0.78	0.66	3.29	0.73	1.48	0.77	1.38	26.71
1977	1.07	2.49	3.50	1.04	4.30	0.83	0.39	3.26	3.33	2.28	5.56	8.98	37.03
1978	4.85	3.28	1.49	3.96	3.17	1.69	1.36	2.05	2.07	0.36	3.83	2.51	30.62
1979	2.55	6.53	2.51	2.47	2.41	0.64	0.25	1.18	1.75	4.85	3.38	7.23	35.75
1980	8.51	4.01	3.11	2.58	2.19	2.50	0.19	0.39	1.56	1.18	6.47	9.72	42.41
1981	1.47	3.86	2.33	1.79	2.25	3.23	0.24	0.15	1.86	4.12	4.62	8.37	34.29
1982	6.31	5.98	2.38	3.56	0.46	1.66	0.94	1.66	3.98	4.44	3.51	8.16	43.04
1983	6.23	7.78	6.80	1.87	1.30	1.95	2.68	2.29	0.39	1.95	8.65	5.30	47.19
1984	2.01	3.93	3.19	3.20	3.41	4.06	T*	0.09	1.46	3.85	9.74	2.56	37.50
1985	0.06	1.79	3.08	1.07	1.52	2.34	0.55	0.48	2.76	2.75	3.89	2.19	22.48
Mean	3.82	4.46	3.13	2.39	2.33	1.97	0.73	1.48	1.99	2.73	5.04	5.64	35.70
Max	8.51	7.78	6.80	3.96	4.30	4.06	2.68	3.29	3.98	4.85	9.74	9.72	47.19
Min	0.06	1.79	1.49	1.04	0.46	0.64	T*	0.09	0.39	0.36	0.77	1.38	22.48

* T indicates trace amount.

Reference: NOAA. Local Climatological Data: Monthly Summary. Portland, Oregon. International Airport. 1976-1985.

Appendix B-7

PIA AVERAGE TEMPERATURE STATISTICS: 1976-85
(All Amounts Are in Degrees Fahrenheit)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1976	42.2	42.1	44.4	50.3	56.6	60.4	67.2	65.5	64.2	54.7	47.0	39.5	52.8
1977	35.7	44.6	45.5	52.9	53.8	63.9	66.3	71.7	60.8	53.8	43.3	42.0	52.9
1978	40.1	44.7	49.1	50.5	54.7	65.1	68.4	67.6	60.9	54.7	39.1	35.3	52.5
1979	30.7	42.9	50.8	53.1	60.1	65.1	70.5	68.6	66.3	58.1	45.0	44.4	54.6
1980	35.1	42.5	46.3	53.8	57.3	60.7	68.9	66.4	63.8	56.0	48.5	44.0	53.6
1981	43.9	44.0	48.8	52.5	57.5	61.8	67.5	72.2	64.9	53.3	48.8	42.7	54.8
1982	39.7	43.6	48.5	49.0	57.6	66.0	67.5	68.6	63.2	54.9	44.4	41.7	53.7
1983	44.4	47.3	50.7	52.7	60.4	62.8	66.5	69.1	61.5	54.2	49.3	36.4	54.6
1984	42.2	45.9	51.1	50.4	56.4	62.2	69.1	69.4	63.7	52.9	46.7	38.3	54.0
1985	36.1	41.1	45.8	53.9	58.3	64.4	74.1	69.3	60.8	52.7	37.3	33.0	52.2
Mean	39.0	43.9	48.1	51.9	57.3	63.2	68.6	68.8	63.0	54.5	44.9	39.7	53.6
Max	44.4	47.3	51.1	53.9	60.4	66.0	74.1	72.2	66.3	58.1	49.3	44.4	54.8
Min	30.7	41.1	44.4	49.0	53.8	60.4	66.3	65.5	60.8	52.7	37.3	33.0	52.2

Reference: NOAA. Local Climatological Data: Monthly Summary. Portland, Oregon. International Airport. 1976-1985.

APPENDIX C

Biological Environment

Appendix C-1

PLANTS OBSERVED ON WEST HAYDEN ISLAND
FROM FIELD VISITS IN MAY, JUNE, AND AUGUST 1983

Family Salicaceae
- Black Cottonwood (*Populus trichocarpa*)
- Willow (*Salix* spp.)

Family Polypodiaceae
- Sword Fern (*Polystichum munitum*)

Family Equisetaceae
- Horsetail (*Equisetum* sp.)

Family Poaceae
- *Poa* sp.
- *Bromus* sp.
- Bermuda Grass (*Cynodon dactylon*)
- Reed Canarygrass (*Phalaris arundinacea*)
- Little Meadow Foxtail (*Alopecurus aequalis*)

Family Cyperaceae
- Sedge (*Carex* spp.)
- Yellow Nut Grass (*Cyperus esculentus*)
- Ovoid Spikerush (*Eleocharis ovata*)

Family Juncaceae
- Common Rush (*Juncus effusus*)
- Rush (*Juncus* spp.)

Family Oleaceae
- Oregon Ash (*Fraxinus latifolia*)

Family Urticaceae
- Stinging Nettle (*Urtica dioica*)

Family Polygonaceae
- Red Sorrel (*Rumex acetosella*)
- Curly Dock (*Rumex crispus*)
- Broadleaf Dock (*Rumex obtusifolius*)
- Western Dock (*Rumex occidentalis*)
- Prostrate Knotweed (*Polygonum aviculare*)
- Smartweed (*Polygonum persicaria*)

Family Chenopodiaceae
- Mexican Tea (*Chenopodium ambrosioides*)
- Jerusalem Goosefoot (*Chenopodium botrys*)

Family Amranthaceae
- Pigweed (*Amaranthus retroflexus*)

Family Portulacaceae
- Common Purslane (Portulaca oleracea)
- Miner's Lettuce (Montia perfoliata)
- Candy Flower (Montia sibirica)

Family Caryophyllaceae
- White Campion (Lychnis alba)
- Doubtful Chickweed (Cerastium dubium)
- Common Chickweed (Cerastium vulgatum)

Family Ranunculaceae
- Woods Buttercup (Ranunculus uncinatus)
- Creeping Buttercup (Ranunculus repens)
- Celery-leaved Buttercup (Ranunculus sceleratus)

Family Cruciferae
- Shepherd's Purse (Capsella bursa-pastoris)
- Bitter Cress (Cardamine oligosperma)
- Yellow Mustard (Brassica campestris)
- Hedge Mustard (Sisymbrium officinale)
- Jim Hill Mustard (Sisymbrium altissimum)
- Wild Radish (Raphanus sativus)
- Yellowcress (Rorippa sp.)
- Western Yellowcress (Rorippa curvisiliqua)
- Common Wallcress (Arabidopsis thaliana)
- Silver Dollar Mustard (Lunaria annua)

Family Saxifragaceae
- Fringecup (Tellima grandiflora)

Family Grossulariaceae
- Gooseberry (Ribes sp.)

Family Rosaceae
- Hawthorn (Crataegus sp.)
- Large-leaved Avens (Geum macrophyllum)
- Wild Rose (Rosa gymnocarpa)
- Salmonberry (Rubus spectabilsis)
- Wild Blackberry (Rubus ursinus)
- Himalayan Blackberry (Rubus discolor)
- Evergreen Blackberry (Rubus laciniatus)

Family Leguminosae
- White Sweetclover (Melilotus alba)
- Yellow Sweetclover (Melilotus officinalis)
- White Clover (Trifolium repens)
- Red Clover (Trifolium pratense)
- Small Hopclover (Trifolium dubium)
- Hare's Foot (Trifolium arvense)
- Scotch Broom (Cytisus scoparius)
- Two-color Lupine (Lupinus bicolor)

Family Leguminosae (cont)
- Slender Vetch (Vicia tetrasperma)
- Common Vetch (Vicia sativa)

Family Simaroubaceae
- Tree-of-Heaven (Ailanthus altissima)

Family Geraniaceae
- Filaree (Erodium cicutarium)
- Dove's Foot Geranium (Geranium molle)

Family Aceraceae
- Big-leaf Maple (Acer macrophyllum)

Family Hypericaceae
- Klamath Weed (Hypericum perforatum)

Family Onagraceae
- Common Evening Primrose (Oenothera strigosa)

Family Umbelliferae
- Anthriscus (Anthriscus scandicina)
- Poison Hemlock (Conium maculatum)

Family Cornaceae
- Red-osier Dogwood (Cornus stolonifera)

Family Convolvulaceae
- Field Morning-glory (Convolvulus arvensis)

Family Boraginaceae
- Small Forget-Me-Not (Myosotis laxa)
- Yellow and Blue Forget-Me-Not (Myosotis discolor)

Family Solanaceae
- Bittersweet Nightshade (Solanum dulcamara)

Family Labiatae
- Purple Dead Nettle (Lamium purpureum)
- Self Heal (Prunella vulgaris)
- Field Mint (Mentha arvensis)

Family Polemoniaceae
- Skunkweed (Navarretia squarrosa)

Family Primulaceae
- Moneywort (Lysimachia nummularia)

Family Scrophulariaceae
- Japanese Mazus (Mazus japonicus)
- Moth Mullein (Verbascum blattaria)
- Wooly Mullein (Verbascum thapsus)
- Thyme-leaved Speedwell (Veronica serpyllifolia)

Family Plantaginaceae
- Common Plantain (Plantago major)
- English Plantain (Plantago lanceolata)

Family Rubiaceae
- Cleavers (Galium aparine)

Family Caprifoliaceae
- Red Elderberry (Sambucus racemosa)
- Snowberry (Symphoricarpos albus)

Family Dipsacaceae
- Teasel (Dipsacus sylvestris)

Family Compositae
- Riverbank Sagewort (Artemisia lindleyana)
- Western Sagewort (Artemisia ludoviciana)
- Absinthium (Artemisia absinthium)
- Low Pussytoes (Antennaria dimorpha)
- Stinking Dogfennel (Anthemis cotula)
- Common Burdock (Arctium minus)
- Diffuse Knapweed (Centaurea diffusa)
- Chicory (Cichorium intybus)
- Canadian Thistle (Cirsium arvense)
- Bull Thistle (Cirsium vulgare)
- Columbia Coreopis (Coreopis atkinsoniana)
- Horseweed (Conyza canadensis)
- Sneezeweed (Helenium autumnale)
- Annual Fleabane (Erigeron annuus)
- False Dandelion (Hypochaeris radicata)
- Prickly Lettuce (Lactuca serriola)
- Pineapple Weed (Matricaria matricarioides)
- Tansy Ragwort (Senecio jacobaea)
- Milk Thistle (Silybum marianum)
- Canadian Goldenrod (Solidago canadensis)
- Western Goldenrod (Solidago occidentalis)
- Annual Sowthistle (Sonchus oleraceus)
- Common Tansy (Tanacetum vulgare)
- Common Dandelion (Taraxacum officinale)
- Common Cocklebur (Xanthium strumarium)

The Nature Conservancy

1234 Northwest 25th Avenue
Portland Oregon 97210
503 228-9561

February 29, 1984

R.G. Davis, Manager
Environmental Sciences Dept.
Portland General Electric Company
121 S.W. Salmon Street
Portland, OR 97204

Dear Mr. Davis,

I have conducted a search of our manual and computer based files for species of concern within the west Hayden Island area as you requested. The parameter of the search was set to include any current or historical occurrences on Hayden Island west of the existing railroad bridge.

The search yielded one record, that being a population of Artemisia lindleyana (riverbank wormwood). This plant, considered rare and endangered in Oregon in 1979 and sensitive in Washington as recently as 1982, has since been de-listed in both states. Many new populations have been discovered for this taxon in recent years and it is more abundant and less threatened than previously assumed. We have removed its occurrence data from our active computer files, and would suggest that information regarding it need not be used in environmental planning or in review of environmental impact statements.

No other records of interest were found. Although no one from our staff has ever done an ecological survey of Hayden Island, based on information from other sources, we do not believe that there is a high potential of finding significant natural features in the area. If you plan on performing any biological field work on Hayden Island, please let us know if we can be of service.

Sincerely yours,

Curt Soper

Curt Soper
Data Base Coordinator

Enclosures

CS:da

Western Regional Office
156 Second Street
San Francisco California 94105
415 777-0541

National Office
1800 North Kent Street
Arlington Virginia 22209
703 841-5300

Appendix C-3

WEST HAYDEN ISLAND BIRD SURVEY RESULTS

Bird censuses were conducted on West Hayden Island to determine community species composition and relative abundance from estimates of density (birds/100 acres). The surveys were conducted along a predetermined transect in riparian woodland, meadow/wetland, and shoreline habitats during May 13-14 and September 29-30, 1982. All birds seen or heard within 100 feet of the transect were noted to species. Tables B and C present the results of the surveys.

Appendix C-3

Table A

BIRDS OBSERVED ON WEST HAYDEN ISLAND
FROM FIELD VISITS IN JULY 1980 THROUGH SEPTEMBER 1984

Family Podicipedidae
- Western Grebe (Aechmophorus occidentalis)

Family Ardeidae
- Great Blue Heron (Ardea herodias)

Family Anatidae
- Canada Goose (Branta canadensis)
- Mallard (Anas platyrhynchos)
- Northern Pintail (Anas acuta)
- American Wigeon (Anas americana)
- Northern Shoveler (Anas clypeata)
- Wood Duck (Aix sponsa)
- Ring-necked Duck (Aythya collaris)
- Lesser Scaup (Aythya affinis)

Family Cathartidae
- Turkey Vulture (Cathartes aura)

Family Accipitridae
- Cooper's Hawk (Accipiter cooperii)
- Red-tailed Hawk (Buteo jamaicensis)
- American Kestrel (Falco sparverius)

Family Phasianidae
- California Quail (Lophortyx californicus)

Family Rallidae
- American Coot (Fulica americana)

Family Charadriidae
- Killdeer (Charadrius vociferus)

Family Scolopacidae
- Spotted Sandpiper (Actitus macularia)

Family Laridae
- Glaucous-winged Gull (Larus glaucescens)
- Herring Gull (Larus argentatus)
- Ring-billed Gull (Larus delawarensis)
- Caspian Tern (Sterna caspia)

Family Columbidae
- Band-tailed Pigeon (Columba fasciata)
- Rock Dove (Columba livia)
- Mourning Dove (Zenaida macroura)

Table A (cont)

Family Strigidae
Great Horned Owl (Bubo virginianus)

Family Trochilidae
Rufous Hummingbird (Selasphorus rufus)

Family Alcedinidae
Belted Kingfisher (Megaceryle alcyon)

Family Picidae
Northern Flicker (Colaptes auratus)
Red-breasted Sapsucker (Sphyrapicus varius)
Downy Woodpecker (Picoides pubescens)

Family Tyrannidae
Western Flycatcher (Empidonax difficilis)
Willow Flycatcher (Empidonax traillii)
Western Wood Pewee (Contopus sordidulus)

Family Hirundinidae
Barn Swallow (Hirundo rustica)
Cliff Swallow (Hirundo pyrrhonota)
Violet-green Swallow (Tachycineta thalassina)
Tree Swallow (Tachycineta bicolor)
Northern Rough-winged Swallow (Stelgidopteryx serripennis)

Family Corvidae
American Crow (Corvus brachyrhynchos)

Family Paridae
Black-capped Chickadee (Parus atricapillus)
Chestnut-backed Chickadee (Parus rufescens)
Bushtit (Psaltriparus minimus)

Family Troglodytidae
House Wren (Troglodytes aedon)
Winter Wren (Troglodytes troglodytes)
Bewick's Wren (Thryomanes bewickii)

Family Muscicapidae
American Robin (Turdus migratorius)
Varied Thrush (Ixoreus naevius)
Townsend's Solitaire (Myadestes townsendi)
Hermit Thrush (Catharus guttata)
Swainson's Thrush (Catharus ustulata)
Ruby-crowned Kinglet (Regulus calendula)

Family Bombycillidae
Cedar Waxwing (Bombycilla cedrorum)

Table A (concl)

Family Sturnidae
- European Starling (Sturnus vulgaris)

Family Vireonidae
- Solitary Vireo (Vireo solitarius)
- Hutton's Vireo (Vireo huttoni)
- Warbling Vireo (Vireo gilvus)

Family Emberizidae
- Orange-crowned Warbler (Vermivora celata)
- Yellow Warbler (Dendroica petechia)
- Yellow-rumped Warbler (Dendroica coronata)
- Black-throated Gray Warbler (Dendroica nigrescens)
- Townsend's Warbler (Dendroica townsendi)
- Wilson's Warbler (Wilsonia pusilla)
- Western Tanager (Piranga ludoviciana)
- Northern Oriole (Icterus galbula)
- Brown-headed Cowbird (Molothrus ater)
- Rufous-sided Towhee (Pipilo erythrophthalmus)
- Savannah Sparrow (Passerculus sandwichensis)
- Song Sparrow (Melospiza melodia)
- Dark-eyed Junco (Junco hyemalis)
- Chipping Sparrow (Spizella passerina)
- White-crowned Sparrow (Zonotrichia leucophrys)
- Golden-crowned Sparrow (Zonotrichia atricapilla)

Family Passeridae
- House Sparrow (Passer domesticus)

Family Fringillidae
- Purple Finch (Carpodacus purpureus)
- House Finch (Carpodacus mexicanus)
- Pine Siskin (Carduelis pinus)
- American Goldfinch (Carduelis tristis)

Appendix C-3

Table B

BIRD SPECIES COMPOSITION AND AVERAGE DENSITY (NUMBER/100 AC)
FROM CENSUSES CONDUCTED ON WEST HAYDEN ISLAND,
MAY 13-14, 1982

Species	Density (No./100 ac)
Great Blue Heron	1.8
Mallard	7.2
Wood Duck	1.8
Red-tailed Hawk	7.2
California Quail	10.8
Killdeer	3.6
Band-tailed Pigeon	3.6
Mourning Dove	16.2
Rufous Hummingbird	1.8
Belted Kingfisher	3.6
Red-breasted Sapsucker	1.8
Downy Woodpecker	19.8
Western Wood Pewee	5.4
Tree Swallow	50.3
Barn Swallow	1.8
Common Crow	3.6
Black-capped Chickadee	10.8
House Wren	9.0
Bewick's Wren	18.0
American Robin	59.2
Ruby-crowned Kinglet	3.6
Starling	64.6
Solitary Vireo	1.8
Warbling Vireo	14.4
Orange-crowned Sarbler	14.4
Yellow Warbler	7.2
Yellow-rumped Warbler	10.8
Wilson's Warbler	88.9
Northern Oriole	44.9
Brown-headed Cowbird	70.0
Black-headed Grosbeak	32.3
Purple Finch	1.8
House Finch	32.3
Pine Siskin	18.0
American Goldfinch	168.7
Rufous-sided Towhee	3.6
Savannah Sparrow	1.8
White-crowned Sparrow	3.6
Golden-crowned Sparrow	1.8
Song Sparrow	71.8
TOTAL	893.6

Appendix C-3

Table C

BIRD SPECIES COMPOSITION AND AVERAGE DENSITY (NUMBER/100 AC)
FROM CENSUSES CONDUCTED ON WEST HAYDEN ISLAND,
SEPTEMBER 29-30, 1982

Species	Density (No./100 ac)
Great Blue Heron	3.6
Red-tailed Hawk	1.8
Turkey Vulture	1.8
California Quail	3.6
Belted Kingfisher	1.8
Northern Flicker	18.0
Downy Woodpecker	16.2
Barn Swallow	9.0
Cliff Swallow	3.6
Black-capped Chickadee	57.4
Bushtit	9.0
Bewick's Wren	18.0
Winter Wren	3.6
American Robin	26.9
Hermit Thrush	9.0
Ruby-crowned Kinglet	1.8
Golden-crowned Kinglet	7.2
Water Pipit	7.2
Cedar Waxwing	5.4
European Starling	21.5
Orange-crowned Warbler	5.4
Yellow-rumped Warbler	3.6
Black-throated Gray Warbler	21.5
Common Yellowthroat	5.4
Wilson's Warbler	1.8
Brewer's Blackbird	80.0
Purple Finch	3.6
House Finch	197.5
Pine Siskin	23.3
American Goldfinch	147.2
Rufous-sided Towhee	10.8
White-crowned Sparrow	12.6
Golden-crowned Sparrow	18.0
Fox Sparrow	1.8
Song Sparrow	93.3
TOTAL	853.0

Appendix C-4

MAMMALS LIKELY TO OCCUR ON WEST HAYDEN ISLAND

Family Didelphidae
- Virginia Opossum (Didelphis virginiana)

Family Soricidae
- Vagrant Shrew (Sorex vagrans)
- Marsh Shrew (Sorex bendirii)

Family Talpidae
- Shrew Mole (Neurotrichus gibbsii)
- Townsend's Mole (Scapanus townsendii)

Family Vespertilionidae
- Little Brown Bat (Myotis lucifugus)
- California Brown Bat (Myotis californicus)
- Long-legged Brown Bat (Myotis volans)
- Long-eared Brown Bat (Myotis evotis)
- Yuma Brown Bat (Myotis yumanensis)
- Hoary Bat (Lasiurus cinereus)
- Big Brown Bat (Eptesicus fuscus)
- Townsend's Big-eared Bat (Plecotus townsendii)

Family Leporidae
- Brush Rabbit (Sylvilagus bachmani)
- Eastern Cottontail (Sylvilagus floridanus)

Family Sciuridae
- Townsend's Chipmunk (Eutamias townsendii)
- California Ground Squirrel (Spermophilus beecheyi)

Family Geomyidae
- Camas Pocket Gopher (Thomomys bulbivorus)

Family Castoridae
- Beaver (Castor canadensis)

Family Cricetidae
- Deer Mouse (Peromyscus maniculatus)
- Dusky-footed Woodrat (Neotoma fuscipes)
- Willamette Valley Vole (Microtus canicaudus)
- Creeping Vole (Microtus oregoni)
- Townsend's Vole (Microtus townsendi)
- Muskrat (Ondatra zibethicus)

Family Muridae
- Norway Rat (Rattus norvegicus)
- House Mouse (Mus musculus)

Family Zapodidae
- Pacific Jumping Mouse (Zapus trinotatus)

Family Capromyidae
Nutria (Myocastor coypus)

Family Canidae
Red Fox (Vulpes vulpes)

Family Procyonidae
Raccoon (Procyon lotor)

Family Mustelidae
Short-tailed Weasel (Mustela erminea)
Long-tailed Weasel (Mustela frenata)
Mink (Mustela vison)
Striped Skunk (Mephitis mephitis)

Family Cervidae
Black-tailed Deer (Odocoileus hemionus)

Appendix C-5

AMPHIBIANS AND REPTILES LIKELY TO OCCUR ON WEST HAYDEN ISLAND

AMPHIBIANS

Family Ambystomatidae
- Northwestern Salamander (Ambystoma gracile)
- Long-toed Salamander (Ambystoma macrodactylum)

Family Salamandridae
- Rough-skinned Newt (Taricha granulosa)

Family Plethodontidae
- Oregon Salamander (Ensatina eschscholtzi)

Family Bufonidae
- Western Toad (Bufo boreas)

Family Hylidae
- Pacific Treefrog (Hyla regilla)

Family Ranidae
- Red-legged Frog (Rana aurora)
- Bullfrog (Rana catesbeiana)

REPTILES

Family Testudinidae
- Painted Turtle (Chrysemys picta)
- Pond Slider (Pseudemys scripta)
- Western Pond Turtle (Clemmys marmorata)

Family Iguanidae
- Western Fence Lizard (Sceloporus occidentalis)

Family Anguidae
- Northern Alligator Lizard (Gerrhonotus coeruleus)

Family Boidae
- Rubber Boa (Charina bottae)

Family Colubridae
- Ringneck Snake (Diadophius punctatus)
- Racer (Coluber constrictor)
- Northwestern Garter Snake (Thamnophis ordinoides)
- Red-spotted Garter Snake (Thamnophis sirtalis)

Appendix C-6

FISH PRESENT IN THE COLUMBIA RIVER AND THE OREGON SLOUGH ADJACENT TO WEST HAYDEN ISLAND

Common Name	Scientific Name	Relative* Abundance	Significance**
Pacific lamprey	Entosphenus tridentata	C	N
River lamprey	Lampetra ayresi	C	N
Western brook lamprey	Lampetra richardsoni	R	N
White sturgeon (juveniles)	Acipenser transmontanus	C	S, C
American shad	Alosa sapidissima	A	S, C
Pink salmon	Oncorhynchus gorbuscha	VR	S, C
Chum salmon	Oncorhynchus keta	R	S, C
Coho salmon	Oncorhynchus kisutch	A	S, C
Sockeye salmon	Oncorhynchus nerka	C	C
Chinook salmon	Oncorhynchus tshawytscha	A	S, C
Mountain whitefish	Prosopium williamsoni	C	S
Cutthroat trout	Salmon clarki	C	S
Rainbow trout (steelhead)	Salmon gairdnerii	A	S
Eulachon (smelt)	Thaleichthys pacificus	R	S, C
Chiselmouth	Acrocheilus alutaceus	C	N
Carp	Cyprinus carpio	C	S
Tui Chub (roach)	Gila bicolor	R	F, N
Peamouth	Mylocheilus caurinus	A	P, N
Northern squawfish	Ptychocheilus oregonensis	A	P, N
Longnose dace	Rhinichthys cataractae	C	F
Leopard dace	Rhinichthys falcatus	R	F
Speckled dace	Rhinichthys osculus	R	F
Redside shiner	Richardsonius balteatus	C	F
Tench	Tinca tinca	R	N
Bridgelip sucker	Catostomus columbianus	C	N
Largescale sucker	Catostomus macrocheilus	A	N
Mountain sucker	Catostomus platyrhynchus	C	N
White catfish	Ictalurus catus	VR	S
Black bullhead	Ictalurus melas	R	S
Yellow bullhead	Ictalurus natalis	R	S
Brown bullhead	Ictalurus nebulosus	C	S
Channel catfish	Ictalurus punctatus	C	S, P
Sand roller	Percopsis transmontanus	C	N
Burbot	Lota lota	VR	N
Pumpkinseed	Lepomis gibbosus	R	S, F
Warmouth	Lepomis gulosus	R	
Bluegill	Lepomis macrochirus	R	S, F
Largemouth bass	Micropterus salmoides	C	S, P
White crappie	Pomoxis annularis	C	S, P
Black crappie	Pomoxis nigromaculatus	C	S, P
Yellow perch	Perca flavescens	A	S, P
Walleye	Stizostedion vitreum	VR	S, P
Coastrange sculpin	Cottus aleuticus	R	F
Prickly sculpin	Cottus asper	A	F
Shorthead sculpin	Cottus confusus	R	F
Piute sculpin	Cottus beldingi	R	F
Reticulate sculpin	Cottus perplexus	C	F
Threespine stickleback	Gasterosteus aculeatus	A	N
Starry flounder	Platichthys stellatus	VR	N

* C = Common; A = Abundant; R = Rare; VR = Very Rare.

** S = Sport; C = Commercial; F = Forage Fish; P = Known Predator; N = No Particular Economic Significance.

Table modified from Cogan and Associates, May 1982.

Appendix C-7

BENTHIC ORGANISMS (#/m^2 AND % COMPOSITION), HAYDEN ISLAND, 1984

Transect**		1		2		3		4		5		6		
Depth	Month	#/m^2	%	#/m^2	%	#/m^2	%	#/m^2	%	#/m^2	%	#/m^2	%	
			(27)		(47)		(28)		(16)		(22)		(84)	Amphipoda (%)
	April	1,530	(25)	980	(30)	1,480	(50)	940	(62)	2,350	(71)	430	(2)	Oligochaeta (%)
			(47)		(23)		(20)		(22)		(7)		(14)	Chironomidae (%)
			(14)		(3)		(54)				(39)		(75)	Amphipoda (%)
10'	May	1,586	(51)	1,522	(86)	2,108	(24)	-		750	(35)	240	(25)	Oligochaeta (%)
			(30)		(9)		(20)				(26)		(0)	Chironomidae (%)
			(69)		(50)		(3)		(0)		(83)		(95)	Amphipoda (%)
	July	283	(8)	2,174	(50)	2,652	(89)	1,620	(98)	690	(0)	1,120	(0)	Oligochaeta (%)
			(23)*		(0)		(7)		(2)		(14)		(5)	Chironomidae (%)
			(24)		(50)		(31)		(4)		(24)		(82)	Amphipoda (%)
	April	2,173	(52)	2,820	(42)	2,020	(54)	1,850	(85)	2,100	(49)	440	(2)	Oligochaeta (%)
			(21)		(5)		(13)		(10)		(24)		(16)	Chironomidae (%)
			(17)		(31)		(4)				(78)		(92)	Amphipoda (%)
20'	May	1,044	(65)	3,370	(53)	2,501	(71)	-		90	(22)	250	(8)	Oligochaeta (%)
			(17)		(14)		(23)				(0)		(0)	Chironomidae (%)
			(27)		(68)		(15)		(0)		(82)		(89)	Amphipoda (%)
	July	718	(33)	1,348	(19)	1,043	(79)	1,460	(95)	550	(0)	1,010	(0)	Oligochaeta (%)
			(33)		(13)		(4)		(4)		(11)		(7)	Chironomidae (%)
							(48)		(43)		(91)		(0)	Amphipoda (%)
	April	-		-		2,540	(43)	700	(37)	110	(9)	0	(0)	Oligochaeta (%)
							(9)		(20)		(0)		(0)	Chironomidae (%)
			(100)		(45)		(27)				(76)		(77)	Amphipoda (%)
40'	May	87	(0)	391	(0)	2,108	(42)	-		250	(12)	260	(4)	Oligochaeta (%)
			(0)		(55)*		(31)				(8)		(12)	Chironomidae (%)
			(66)		(83)		(38)		(1)		(79)		(29)	Amphipoda (%)
	July	131	(17)	260	(0)	564	(38)	1,420	(92)	1,490	(15)*	170	(65)*	Oligochaeta (%)
			(17)		(17)		(15)		(7)		(5)		(6)	Chironomidae (%)

Appendix C-8

BENTHIC ORGANISMS COLLECTED FROM THE COLUMBIA RIVER AND THE OREGON SLOUGH ADJACENT TO WEST HAYDEN ISLAND (April, May, and July 1984)

Scientific Name	Common Name
Nematoda	Roundworms
Annelida	
Polychaeta	
Oligochaeta	Aquatic earthworms
Mollusca	
Pelecypoda	Clams, mussels
Arthropoda	
Crustacea	
Amphipoda	Scuds
Insecta*	
Ephemeroptera	Mayflies
Odonata	Dragonflies, damselflies
Diptera	
Chironomidae	Midges
Ceratopogonidae	
Petromyzoniformes	
Petromyzontidae	Lampreys (ammocoete)

* Others reported from area:

Collembola (Springtails)
Coleoptera (Beetles)
Decapoda (Crayfish)

Appendix C-9

ZOOPLANKTON OCCURRING IN THE COLUMBIA RIVER
IN THE VICINITY OF WEST HAYDEN ISLAND

Taxa

Rotifera
- Asplanchna
- Brachionus
- Conochiloides
- Epiphanes
- Filinia
- Kellicottia
- Keratella
- Notholca
- Platyias
- Polyarthra
- Synchaeta
- Testudinella
- Trichocerca
- Trichotria

Cladocera
- Alona
- Alonella
- Bosmina
- Camptocercus
- Ceriodaphnia
- Chydorus
- Daphnia
- Diaphanosoma
- Holopedium
- Ilyocryptus
- Leptodora
- Leydigia
- Macrothrix
- Moina
- Monospilus
- Sida
- Simocephalus

Copepoda
- Calanoida
- Cyclopoida
- Harpacticoida
- Copepoda nauplii

Ostracoda

Amphipoda
- Corophium
- Gammarus

APPENDIX D

Social and Economic Setting

Appendix D-1

PORTLAND GENERAL ELECTRIC COMPANY
2. S.W. SALMON STREET
PORTLAND, OREGON 97204

JAMES W. DURHAM

February 28, 1984

Dear _____:

Portland General Electric Company is applying for a fill permit from the U.S. Army Corps of Engineers for our West Hayden Island Property. This is just one in a series of required steps to the future marine industrial development of West Hayden Island. This potential development offers the Pacific Northwest an excellent opportunity for an improved economy.

In the land use planning phase, PGE received unanimous approval from the Multnomah County Commissioners to change the classification of West Hayden Island from "multiple-use forest" to "future urban". The Metropolitan Service District also unanimously approved the inclusion of West Hayden Island in the Urban Growth Boundary. The participation of citizens and government agencies contributed significantly to these planning decisions. As we prepare our application for a fill permit, which will include the preparation of an environmental impact statement, we encourage your participation.

Enclosed is a West Hayden Island Brief Sheet. We will include your name and address on the U.S. Army Corps of Engineers' mailing list for public notices. Should you wish additional information, I encourage you to contact West Hayden Island Project Manager Dave Fredrikson (226-5694) or Public Affairs Representative Lynne Saxton (226-8891). With your participation, we can look forward to satisfactory resolution of environmental and transportation concerns, which will facilitate the future marine industrial development of West Hayden Island.

Sincerely,

Enclosure

Appendix D-2

1982 EMPLOYMENT AT RIVERGATE*

Firm	Principal Activity	Employees**	Acreage***	Employees per Acre
Waterfront				
Ash Grove Cement	Quicklime Processing	25	30	0.8
Collier Carbon & Chemical	Urea, Ammonia Distribution	11	32	0.3
Columbia Grain, Inc.	Grain Elevator	5	41	0.1
Oregon Steel (Gilmore)	Iron Ore Reduction	321	150	2.2
Terminal 4	Public Port Terminal	260	200	1.3
Terminal 6	Public Port Terminal	95	96	1.0
Waterways Terminal	Public Terminal	65	61	1.1
Subtotal		782	610	1.3
Nonwaterfront				
Acme International, Inc.	Building Mat'l Distributor	27	5	5.4
Albina Transfer	Trucking	48	10	4.8
Beall Transliner, Inc.	Truck, Tank Manufacturing	40	6	6.7
Richard Blickle	Bldg Repair & Maintenance	6	3	2.0

* Includes only developed parcels.

** Latest employment figures available from Port of Portland (1979 data) or Directory of Oregon Manufacturers (1980-81 data).

*** Rounded to nearest whole acre.

Appendix D-2 (concl)

Firm	Principal Activity	Employees**	Acreage***	Employees per Acre
Consolidated Metco, Inc.	Aluminum Castings Mfg	250	20	12.5
H. B. Fuller & Company	Industrial Adhesives	60	5	12
Inter-City Metals	Ferrous Scrap	60	10	6
Montgomery Ward	Regional Warehouse	125+	12	10.4
Nordstrom	Regional Warehouse	60	15	4.0
Oregon Transfer	Warehouse	14	10	1.4
Purdy Brush	Paintbrush Manufacturing	175	10	17.5
Rivergate Credit Union	Federal Credit Union	4	1	4.0
Rodda Paint	Paint Manufacturing	50	4	12.5
Snap-On Tool	Regional Warehouse	30	1	30.0
Steinfeld's	Food Processing	85	15	5.6
Westinghouse	Electrical Appliance Service	63	4	15.8
Subtotal		1,097	131	8.4
TOTAL		1,879	741	2.5

** Latest employment figures available from Port of Portland (1979 data) or Directory of Oregon Manufacturers (1980-81 data).

*** Rounded to nearest whole acre.

Appendix D-3

ESTIMATED SITE-GENERATED TRAFFIC

(Driveway Volumes)

	Waterfront Industrial	Associated Industrial Support	Total
Alternative A			
Employment	714	755	1,469
24-Hour Two-Way Volume	4,498	2,297	6,795
AM Peak-Hour Enter	214	306	520
AM Peak-Hour Exit	86	65	151
PM Peak-Hour Enter	178	153	331
PM Peak-Hour Exit	287	284	5,711
Alternative B			
Employment	664	155	819
24-Hour Two-Way Volume	4,183	472	4,655
AM Peak-Hour Enter	199	63	262
AM Peak-Hour Exit	80	13	93
PM Peak-Hour Enter	166	31	197
PM Peak-Hour Exit	266	58	324
Alternative C			
Employment	658	0	658
24-Hour Two-Way Volume	4,145	0	4,145
AM Peak-Hour Enter	197	0	197
AM Peak-Hour Exit	79	0	79
PM Peak-Hour Enter	164	0	164
PM Peak-Hour Exit	263	0	263
No Action			
Employment	-	-	2
24-Hour Two-Way Volume	-	-	20*
AM Peak-Hour Enter	-	-	2
AM Peak-Hour Exit	-	-	0
PM Peak-Hour Enter	-	-	0
PM Peak-Hour Exit	-	-	2

* Estimated traffic associated with the livestock operation, maintenance of the transmission lines, etc.

Appendix D-4

ESTIMATED SITE-GENERATED TRAFFIC
(Cogan, 1982)

(Driveway Volumes)

	Waterfront Industrial	Associated Industrial Support	Total
Low Range			
Employment	1,000	690	1,690
24-Hour Two-Way Volume	6,300	2,100	8,400
AM Peak-Hour Enter	300	280	580
AM Peak-Hour Exit	120	60	180
PM Peak-Hour Enter	250	140	390
PM Peak-Hour Exit	400	260	660
High Range			
Employment	1,000	1,490	2,490
24-Hour Two-Way Volume	6,300	4,600	10,900
AM Peak-Hour Enter	300	600	900
AM Peak-Hour Exit	120	130	250
PM Peak-Hour Enter	250	290	540
PM Peak-Hour Exit	400	560	960

Appendix D-5

TAX GENERATION ANALYSIS

Alternative A

Property Tax - Land

Use	Developed Acres	Per Acre Value	Total Value
Marine	357.0	$90,000	$32,130,000
Supporting Industrial	94.4	120,000	$11,328,000
Total			$43,458,000

Property Tax - Facilities

Use	Type	No.	Value	Total Value
Marine	Major	5	$30,000,000	$150,000,000
Marine	Minor	4	15,000,000	60,000,000
Supporting Industrial	-	25	2,000,000	50,000,000
Total				$260,000,000
Total (Land and Facilities)				$303,458,000

Payroll

Use	No. of Employees	Average Income	Total Income
Marine	714	$25,000	$17,850,000
Supporting Industrial	755	21,000	15,855,000
Total			$33,705,000

Estimated Annual Tax

Property Tax (at $24 per $1,000)	$ 7,282,992
State Income Tax (at 10%)	3,370,500
Federal Income Tax (at 20%)	6,741,000
Total	$17,394,492

Alternative B

Property Tax - Land

Use	Developed Acres	Per Acre Value	Total Value
Marine	332.0	$90,000	$29,880,000
Supporting Industrial	19.4	120,000	$ 2,328,000
Total			$32,208,000

Property Tax - Facilities

Use	Type	No.	Value	Total Value
Marine	Major	5	$30,000,000	$150,000,000
Marine	Minor	3	15,000,000	45,000,000
Supporting Industrial	-	4	2,000,000	8,000,000
Total				$203,000,000
Total (Land and Facilities)				$235,208,000

Payroll

Use	No. of Employees	Average Income	Total Income
Marine	664	$25,000	$16,600,000
Supporting Industrial	155	21,000	3,255,000
Total			$19,855,000

Estimated Annual Tax

Property Tax (at $24 per $1,000)	$ 5,644,992
State Income Tax (at 10%)	1,985,500
Federal Income Tax (at 20%)	3,971,000
Total	$11,601,492

Alternative C

Property Tax - Land

Use	Developed Acres	Per Acre Value	Total Value
Marine	329	$90,000	$29,610,000
Total			$29,610,000

Property Tax - Facilities

Use	Type	No.	Value	Total Value
Marine	Major	6	$30,000,000	$180,000,000
Total				$180,000,000
Total (Land and Facilities)				$209,610,000

Payroll

Use	No. of Employees	Average Income	Total Income
Marine	658	$25,000	$16,450,000
Total			$16,450,000

Estimated Annual Tax

Property Tax (at $24 per $1,000)	$5,030,640
State Income Tax (at 10%)	$1,645,000
Federal Income Tax (at 20%)	3,290,000
Total	$9,965,640

No Action

Property Tax - Land

Use	Developed Acres	Per Acre Value	Total Value
Agriculture	496	$1,200	$595,200
Total			$595,200

Property Tax - Facilities

Use	Type	No.	Value	Total Value
Agriculture	-	1	$50,000	$50,000
Total				$50,000
Total (Land and Facilities)				$645,200

Payroll

Use	No. of Employees	Average Income	Total Income
Agriculture	2	$21,000	$42,000
Total			$42,000

Estimated Annual Tax

Property Tax (at $24 per $1,000)	$15,480
State Income Tax (at 10%)	$ 4,200
Federal Income Tax (at 20%)	8,400
Total	$28,080

Appendix D-6

NOISE

All ambient tests were conducted in a manner consistent with the Oregon Department of Environmental Quality Sound Measurement Procedures Manual, NPCS-1. Measured sound levels were taken in the dBA, linear, and full octave bands from 31.5 Hz to 8,000 Hz. Sound measurements were taken utilizing a Bruel and Kjaer sound level meter, Model No. 2209, and Bruel and Kjaer Model No. 1613 octave filter network. All measurements were taken through a Bruel and Kjaer Model No. 4161, 1-inch condenser microphone. All equipment used during the testing met American National Standards Institute (ANSI) standard Type 1 criteria (ANSI S1.4-1971).

The Washington Administrative Code (Chapter 173, Section 60) provides noise emission limits for new industrial developments on or adjacent to property within state boundaries. The code designates emission limits at receiver property lines. The actual limit depends on the zoning, or use, of both the noise producer and receiver properties. Industrially zoned noise producers are limited to the following levels at receiver property lines:

60 dBA at residential property lines
65 dBA at commercial property lines
70 dBA at industrial property lines

These levels are far more liberal than those stipulated by the Oregon Administrative Rules (OAR, Chapter 340, Division 35). Noise receptors located across the Oregon Slough from the island will require more stringent noise emission limits than receptors located in Washington. Therefore, compliance with the Oregon regulations by industries sited on Hayden Island will achieve compliance with the Washington regulations.

Oregon Administrative Rules stipulate maximum noise levels that can be produced for both daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.). The restrictions include maximum sound levels for dBA and the full octave bands from 31.5 Hz to 8,000 Hz. A list of the measured daytime ambient sound levels and the corresponding administrative rule limits are shown in Table A. Existing nighttime ambient levels and the corresponding restrictions are shown in Table B. Daytime measurements were taken between 9 a.m. and 3 p.m. on November 8 and 15, 1984. Nighttime measurements were taken between 12 midnight and 5 a.m. on December 4, 1984. All data are expressed as L_{50} sound levels. An L_{50} sound level corresponds to a "statistical mean" with 50 percent of the data points above and 50 percent of the data points below the sound level.

Appendix D-6

Table A

DAYTIME AMBIENT NOISE TESTING

Test Frequency or Octave Band (Hz)	1	2	3	4	5	6	7	8	9	10	11	12	Oregon Administrative Rule Limit* (Daytime)
dBA	53	52	51	51	49	52	51	51	50	51	52	53	55
31.5	67	67	66	68	65	67	67	66	64	64	64	66	68
63	65	66	65	64	62	65	66	65	63	63	64	64	65
125	63	63	62	59	59	66	61	62	61	61	61	63	61
250	54	55	53	48	49	51	55	52	56	56	58	55	55
500	49	47	50	49	45	46	49	47	48	49	52	50	52
1,000	47	42	48	44	38	39	42	40	42	46	49	48	49
2,000	41	41	42	45	30	26	35	32	34	37	40	42	46
4,000	37	36	35	40	25	21	21	23	22	30	35	37	43
8,000	31	30	31	31	17	15	15	16	17	20	23	28	40

* Measured at "nearest noise-sensitive" property.

Appendix D-6

Table B

NIGHTTIME AMBIENT NOISE TESTING

Test Frequency or Octave Band (Hz)	1	2	3	4	5	6	7	8	9	10	11	12	Oregon Administrative Rule Limit* (Nighttime)
dBA	48	48	46	46	45	46	47	48	46	45	46	46	50
31.5	65	64	65	63	66	65	67	65	63	60	61	60	65
63	60	59	60	59	59	58	60	59	57	58	57	56	62
125	59	59	57	56	57	55	56	55	54	55	56	55	56
250	51	50	49	49	50	51	51	51	50	49	48	49	50
500	46	47	47	46	44	45	44	46	45	43	43	43	46
1,000	44	42	44	43	44	43	40	41	43	42	42	41	43
2,000	35	33	33	31	34	31	33	32	32	31	30	30	40
4,000	30	29	28	29	29	31	30	29	30	29	27	28	37
8,000	19	21	23	19	21	20	20	20	21	22	18	21	34

* Measured at "nearest noise-sensitive" property.

APPENDIX E

Public Comments and Responses

Appendix E

PUBLIC COMMENTS AND RESPONSES

Table of Contents

October 20, 1985

To:

Brian Lightcap
US Army Corps of Engineers
Portland District
POB 2946
Portland, OR 97208
AND
David E. Fredrikson
Portland General Electric Company
121 SW Salmon Street
Portland, OR 97204
AND
Department of Environmental Quality
POB 1760
Portland, OR 97207

Re: 071-OYA-2-005254

I am concerned about the proposed changes for the water way on the Columbia River side of Hayden Island. It looks to me as if the dredging and turning basin are intended to accommodate large vessels. The proposed basin is directly across the channel from my home in the Class Harbor Moorage.

Large ship activity would create large wakes. Wake activity is destructive to floating homes potentially causing structural damage as well as unpleasant living conditions. How will the project be controlled to avoid damage to my home, decrease of its value, and reduction of my quality of life?

I do not see noise control in the proposal. What is the noise impact of the proposed dredging, and of the industrial activity to follow?

This channel is heavily used for recreational boating - including my paddling around in a small engine-less boat. How will the safety and beauty of recreational boating be maintained during dredging, and in accord with activities to follow?

This moorage is a beautiful place to live. Ducks abound, and herons stalk in a stately manner as they fish along the shore beside my home. Across the way, the changing shades of green on Hayden Island create the effect of a classic watercolor. How will the appearance of the area, from the water as well as from the shore, be preserved during and after this project?

Thank you for your attention to these concerns.

Barbara C. Ring

Barbara C. Ring, Ph.D.

3939 North Suttle Road • Portland, Oregon 97217

PSD0064497

The proposed basin on the Oregon Slough side of West Hayden Island would be created to obtain fill material. It is not intended as a turning basin and would not be used by large ships. However, an increase in commercial water traffic and related activities can be expected. An access channel and turning basin are proposed for the Columbia River side.

Noise levels will increase as a result of the proposed development. General noise control measures are presented in Section 4.3.6.

The Portland Metropolitan Area Waterways Development Plan discourages recreational boating in this area (see Page III-48). Recreational boaters would need to operate in a manner compatible with the dredging operations and commercial shipping activities.

Visual impacts are addressed in Section 4.3.5. Alternatives B and C propose leaving the south side of West Hayden Island in a natural condition directly across from Class Harbor Moorage.

CITY OF
PORTLAND, OREGON
BUREAU OF ENVIRONMENTAL SERVICES

Dick Bogle, Commissioner
John Lang, Administrator
1120 S.W. 5th Ave.
Portland, Oregon 97204-1972
(503) 796-7169

October 31, 1985

RECEIVED
NOV 14 [illegible]
REGULATORY FUNCTIONS BR.

U. S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
REGULATORY BRANCH
P. O. BOX 2946
PORTLAND, OR 97208

Subject: Reference No. 071-OYA-2-005254
(Columbia River-Marine Industrial Park)

The Bureau of Environmental Services of the City of Portland has reviewed the Draft Environmental Impact Study for the West Hayden Island Marine Industrial Park. This letter is intended to apprise the U. S. Army Corps of Engineers and the Applicant, PGE, of the importance of the protection of the City's 102-inch pressure outfall sewer pipe.

Appropriate filling setbacks will avoid damage to the existing sewer outfall line (Section 4.4.1). A restriction zone has been added to plan maps in Figures 2.1-II, 2-IV, and 2-V to reflect your comments.

The existing 102-inch pressure outfall pipeline conveys treated effluent for the City's Columbia Boulevard Sewage Treatement Plant across Hayden Island to the Columbia River. The pipeline is located approximately 600 feet northwesterly and parallel to the Burlington Northern Railroad Tracks. The outfall sewer pipe was constructed in 1950 and now carries a peak rate of discharge of three hundred million gallons of treatment effluent per day. The pipe is a monolithic concrete semi-elliptical cross section and has a lightly reinforced thin walled section, incapable of carrying significant surface loads or withstanding appreciable settlements.

Previous engineering studies of the pipeline on the south side of the Oregon Slough have revealed the existence of unstable soil conditions. Fill over and near the pipeline have caused significant settlement and structural damage to the line. The City is gravely concerned with the seriousness of potential damage to the outfall sewer caused by the proposed PGE fill.

To ensure that the City's pipeline is adequately protected, a detailed engineering investigation must be conducted prior to placing material within seventy-five feet (75') of either side of the centerline of the pipe to determine the affects of the fill and methods of protection required.

Questions regarding this matter should be referred to Ron Sunnarborg, phone 796-7090.

Very truly yours,

John M. Lang, P.E.
Administrator

RGS:es
P.G.E., 121 SW Salmon Street, Portland, Or. 97204

PSD006498

Engineering Bill Gaffi | System Management Bob Rieck | Wastewater Treatment Jack Irwin | Solid Waste Delyn Kies

Hon Bruce
1719 N. Juniper
S. Army Engineers Portland Oregon
District Portland 97217
ATTN: NPPEN-EQ
P.O. Box 2946
Portland Oregon
97208-2946

Sir

I am concerned about the new proposed bridge that is to be built to the west end of Hayden Island. I have a sail boat and its mast top is 40' off the water and I am only one of many anchored at Juniper beach home boat marina. Is the bridge to be high enough to allow us to transit under it, or is it a swing or bascule bridge or what. I do not want to find my boat locked in between two bridges.

Please advise me.

Hon Bruce

PSD009499

Specific details regarding the bridge, including its height, will be addressed during a separate approval process with the U.S. Coast Guard. Bridge permit application will be subject to fill permit approval.

Department of Transportation
HIGHWAY DIVISION
Metro Region
9002 SE. McLOUGHLIN BLVD., MILWAUKIE, OREGON 97222 PHONE 653-3090

November 8, 1985

In Reply Refer To
File No.:

Department of the Army
Portland District Corps of Engineers
P. O. Box 2946
Portland, OR 97208

Attn: NPPPL-HR-EQ

Re: Public Notice No. 071-OYA-2-005254
Hayden Island Marine Industrial Park in Portland, Oregon
DEIS Review

We have reviewed the DEIS for the Hayden Island Marine Industrial Park in Portland, Oregon as requested. Our review focused on the projected impact of this development on the transportation system.

Page IV-15 indicates that "One condition of the land use approval was that a more detailed transportation study and program be prepared prior to development and implemented as necessary to alleviate adverse impacts." We believe that this study should be done now and made part of the FEIS so that specific mitigation measures can be evaluated and incorporated in the project, if necessary.

The DEIS is vague in terms of how much improvement to the transportation system may be realistically made with rideshare, shuttle bus, flex schedules, etc. If the transportation system is expected to reach saturation by the year 2000, what highway modifications will be required to offset the impacts of this project? The forecast population and employment has now been identified in Appendix D-3 and D-4 of the DEIS. From this, forecast transportation needs should be made.

To properly evaluate the transportation impacts, we will need to review any recommended transportation modifications or additions, when and how the recommended modifications should be implemented, and what agency or other entity would be responsible for their implementation.

We feel it is necessary at this time to identify the recommended course of action to provide a transportation system to carry the forecast traffic. Specific mitigation measures should be identified, incorporated in the project as appropriate, and reported in the FEIS.

Edward L. Hardt

EDWARD L. HARDT
Metro Region Engineer

cc Cliff Christiansen

A recent computer analysis by the ODOT indicated the project as currently designed will work within the transportation system (Section 4.3.3). This analysis will be updated at each stage of the development process.

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

NOV 8 1985

REPLY TO ATTN OF: M/S 423

Colonel Gary R. Lord, District Engineer
Portland District, Corps of Engineers
P.O. Box 2946
Portland, Oregon 97208

ATTN: NPPPL-NR-EQ

RE: West Hayden Island Marine Industrial Park
Draft Environmental Impact Statement

Dear Colonel Lord:

We have reviewed the referenced document concerning the development of a Marine Industrial Park on Hayden Island in the Columbia River. Our review was conducted in accordance with our responsibility under Section 309 of the Clean Air Act to determine whether the impacts of proposed federal actions are acceptable in terms of environmental quality, public health and welfare. The project will result in the filling of 67 acres of wetlands, the destruction of valuable riparian areas and the dredging of shallow water habitat used by migrating salmonids.

We recognize that the needs projections for water-dependent marine industrial development are rather speculative. Adverse impacts resulting from development of these lands are irreversible regardless of the actual growth that takes place. Therefore, if this project complies with Section 404 of the Clean Water Act, we recommend that the Corps issue permits for a staged project. The dredging and filling activities are proposed to take place over a 10 to 15 year period. We recommend the lower habitat value areas be filled first, with the riparian and wetland areas saved until their use becomes absolutely necessary. We understand that an approach like this has been suggested by the applicant.

The applicant is committed to mitigation. However, details of the mitigation plan have not been developed. We recommend a detailed mitigation plan acceptable to the resource agencies be included in the Final Environmental Impact Statement (FEIS). Mitigation for the loss of riparian habitat should commence immediately as replacement of the cottonwood/ash complex will take many years. The plan must contain provisions for monitoring and maintenance of the mitigation site. The mitigation should be consistent with EPA's regional mitigation policy (enclosed). This plan should be made a condition of any 404 permit issued for this project. We also request that the Corps complete a draft 404(b)(1) evaluation and include such in the FEIS.

Based on our review, and in consideration of the enclosed comments, we have rated the draft EIS as EC-2: (Environmental Concerns-Insufficient Information). A summary of the EPA rating system for draft EISs is enclosed for your reference. We are confident that, through consideration of these comments, the final EIS will adequately address our concerns, and the project's environmental impacts will be minimized.

If you have any questions regarding our comments, please contact Mr. Gary Voerman of my staff at FTS 399-8513.

Sincerely,

Robert S. Burd
Director, Water Division

PSD006501

Preparation of the site will be conducted in phases, beginning with areas along the north shore. This would delay impacts to more valuable habitats along the Oregon Slough. Each development phase will be conducted on an as-needed basis. Total development of the site may extend beyond the anticipated 10- to 15-year period depending on the economic conditions of the region.

Mitigation measures for the proposed marine development are discussed in Section 4.4. An approved plan will be a condition of the fill permit and include compensation for both wetland and riparian habitat loss. The mitigation plan will be implemented in phases to allow for corrective action and time for new habitats to become established.

A 404(b)(1) evaluation is not included in the FEIS. One will be prepared by the Corps for the selected development plan as part of the decision-making process.

U.S. ENVIRONMENTAL PROTECTION AGENCY
West Hayden Island MIP Draft EIS
DETAILED COMMENTS

Purpose and Need

This section clearly shows that future marine industrial acreage requirements in the Port of Portland area are not known with any degree of accuracy. It would be most useful to conduct a more thorough needs analysis as the one presented in this document is unconvincing.

It is stated on page I-2 that "additional private land needs will be generated by public policies aimed at developing segments of the Willamette River greenway at the south edge of downtown Portland." The statement raises several questions. What policies are being referred to here? How do the policies translate into the need for additional water-dependent marine industrial lands? Do the seventy-five acres involved contain industries all requiring waterfront property? A thorough discussion of this issue is necessary if the reader is to make an informed judgment concerning possible waterfront needs.

The applicant believes the need is great enough to fund the project. If the permit is issued, the project will be implemented in phases on an as-needed basis.

The methodology for estimating future acreage requirements for private industrial land (pg. I-2 and I-3) ignores several relevant factors. Using the 1960 to 1980 period to calculate future land absorption rates can be misleading. What has the water-dependent marine industrial land absorption rate been for the last five years? What percentage of industries historically located on the waterfront are truly water-dependent? Based upon the present economic forecast what is a realistic assessment of water-dependent marine industrial land requirements for the future?

The market need for this 500 acres was based on the Oregon Port Study. The 75 acres were in addition to that need. These lands currently are being redeveloped, and at this time, no plans have been proposed to relocate them. The industries are shown in Table 1.3-I, and all use the waterfront.

Because of the expansion of Port of Portland facilities, the land absorption over the past five years has been consistent with the projection.

The document also contains a "refutation" of the 1980 CH_2M Hill Study for The Washington Ports Association (pg. I-3). It assumes that lower Columbia River Ports will pick up six grain terminals and one container terminal from Puget Sound Ports because of high land-side shipping costs. This statement constitutes the total analysis of this issue. Clearly a more thorough analysis is warranted before committing public resources, such as valuable wetland and riparian habitat, to meeting the "need."

The assumption was that if a firm wanted to locate in Vancouver, Washington, and could not find a site, their next logical choice would be Portland, not Seattle. This language has been clarified on Page I-4.

Will the 100 acres of land at rivergate (now ostensibly committed to a coal terminal) be available for water-dependent marine industrial development if the coal terminal proves to be infeasible?

The coal terminal site is anticipated to be tied up in litigation for a number of years.

All of these questions lead us to conclude that the question of need has not been adequately addressed. Given the uncertainty inherent in attempting to project future needs, we recommend this project be built in stages, if at all. The land with the least valuable habitat should be filled first. However, we suggest that before any permits decisions are made a much more comprehensive and analytically sound needs analysis should be completed.

Affected Environment

We would appreciate receiving any sediment physical/chemical data you process. If there is no such data, we recommend not using dredged material for fill in wetland areas.

Sediments in the Columbia River are nearly all fine- to medium-grain sand which are continually cleaned by river currents. Because sand has a low affinity to accumulating contaminants, concentrations sufficient to cause adverse impacts are not expected when dredged materials are used for fill (Section 4.1.3). Oregon Slough sediments are expected to contain finer material (Section 3.1.6). Sediments from these areas will be contained in upland disposal sites.

Under the description of vegetation and wetlands, we recommend comparisons of the existing riparian habitat acreages to those remaining in the Portland vicinity as an indication of value. The U.S. Fish and Wildlife Service has given the cottonwood/ash riparian areas a resource category 2 designation, requiring complete replacement. We concur with this finding.

Riparian habitat comparisons between West Hayden Island and similar habitat between RM 79 to RM 145 are made in Section 3.2.1.A. The Corps (1976) estimates 9,276 acres of similar wooded riparian habitat exist within this area. West Hayden Island habitat represents 2.5 percent of this total.

It is important to know which species of amphipods (pg. III-20) are found offshore so that a reasoned analysis can be made of the value of these areas as fish habitat.

Amphipod taxa are listed in Appendix C-9.

Alternatives

None of the proposed development alternatives considers scaling back the development to avoid or minimize adverse wetlands and riparian habitat impacts. Such an alternative should be explored in the final environmental impact statement. Alternative C does consider on-site mitigation and avoidance of some wetlands. Additional alternative site configurations would allow preservation of riparian and wetland habitat in a continuous strip on the western end of the island. This type of alignment would better serve wildlife as it would minimize adverse noise and traffic impacts associated with the alternative C proposal.

Two of the development alternatives provide for on-site mitigation opportunities (see Section 2.0). The former Alternative C (open center plan) in the DEIS was dropped from consideration (see Section 2.2.3).

The alternatives to and impacts of the proposed bridge across Oregon slough were not discussed in this environmental impact statement. We understand that they will be discussed in a separate EIS prepared by the City of Portland and the Federal Highway Administration. This project will not be possible without the bridge and, therefore, the potential adverse environmental impacts of bridge alternatives need to be considered in making the §404 permits decision. For example, the bridge may affect wetland resources and result in adverse noise and air quality impacts. These impacts should be discussed in the FEIS.

Ideally the impacts of the proposed bridge construction could have been addressed in greater detail. However, detailed information is not available at this time because the actual bridge location is dependent on the proposed Marine Drive relocation. The impacts associated with the proposed development of West Hayden Island would be secondary impacts of construction of the new bridge. The direct impacts will be addressed in detail in an EIS supplement or EA to be prepared as part of the Coast Guard permit review process.

Since future industries cannot be positively identified, air quality impacts of the proposed development are unknown. All parties should be aware of the requirements for complying the State Implementation Plan. We are especially concerned that the proposed project not contribute to non-attainment in those areas in and around Portland currently experiencing attainment problems for carbon monoxide, ozone and total suspended particulates. Thus the Final EIS should describe the measures which can and would be taken to prevent such air quality problems from developing.

Air quality regulatory compliance will be addressed by individual permittees after land is prepared for development. Industries would be limited to those that are able to comply with current air quality standards.

The reason for rejecting alternative sites and site configurations are not thoroughly discussed on page II-20. More detail should be provided concerning why alternatives are not considered feasible by the applicant and whether any of these alternatives are practicable within the meaning of the §404(b)(1) Guidelines.

Six development alternatives have been considered, three of which have been carried forward in the FEIS. Reasons for plan rejection include economic, functional, and environmental considerations (Section 2.2.3).

The FEIS should state why the lands located near the Port of Vancouver were rejected as a feasible alternative location for the proposed project.

The Port of Vancouver plans to use their property to meet their own development needs.

An alternative land use for the West Hayden Island Site is for wildlife habitat. This should be listed and discussed under section 2.4 (pg. II-18).

The no action alternative addresses increased grazing or silviculture as feasible alternative land uses (Section 2.1) for West Hayden Island. Use of West Hayden Island for wildlife habitat may be feasible but is not economically practical. The no action alternative is limited to a discussion of reasonably foreseeable alternative uses.

Environmental Effects & Mitigation

There are a few topics where the FEIS will need to provide a more thorough analysis of potential environmental impacts. These include:

1. It should provide a thorough characterization of the frequency, extent and environmental impacts of any required maintenance dredging.

2. Noise impacts of the railroad use on the site should be estimated. A worst case noise assessment should be conducted. Noise impacts from vehicular traffic should be evaluated as part of the bridge construction EIS.

3. Project impacts on the remainder of West Hayden Island, especially the natural area to the west of the proposed development.

There are also several mitigation issues that should be addressed in the Final EIS. These are noted briefly, below.

1. We recommend that any §10 or §404 permit contain a condition requiring the excavation at the southwest side of the island be conducted behind a berm to minimize adverse water quality impacts.

2. While little is known of the use of the north shore by adult or juvenile salmonids, both the U.S. Fish and Wildlife Service and the National Marine Fisheries Service consider this shallow water habitat to be important. This document should discuss proposals to mitigate for salmonid habitat loss due to dredging. We concur with the proposed timing restrictions.

3. The construction of bulkheads, if necessary, should be confined to the south shore as the value of the north shore to migrating salmonids is considered to be greater. Pile-supported structures (if needed) should be installed whenever feasible instead of bulkheads, especially on the north shore. Consideration should be given to consolidating dock facilities so that shoreline impacts are minimized.

4. We agree with the proposal to phase development to avoid wetland impacts for as long as possible but we recommend mitigation begin immediately to allow sufficient time for monitoring and modification.

5. The applicant has committed to mitigation for the adversely impacted wetlands. We also recommend mitigation for the riparian habitat to be lost to this project, as it is a resource category 2 habitat. The details of a mitigation plan must be worked out and agreed upon by all responsible parties before the FEIS is issued. This mitigation agreement must be made a condition of the §404 permit. Mitigation should begin as soon as possible. This is especially important for the riparian areas as it will take several years to recreate the cottonwood/ash habitat.

All proposed mitigation should comply with EPA's regional mitigation policy (enclosed). We will seek firm commitments to specific mitigation goals, monitoring and appropriate mitigation site modification. We request a copy of the HEP evaluation and wish to participate with the other resource agencies in reviewing detailed mitigation plans.

Maintenance dredging is discussed in Sections 2.1.2 and 4.2.2 of the FEIS.

Noise regulation compliance and mitigation measures are discussed in Section 4.3.6.

Development of the applicant's property may encourage similar development in the future of adjacent natural areas. Wildlife impacts in adjacent areas are discussed in Section 4.2.1.B.

Mitigation measures are addressed in Section 4.4. Excavation of the basin will be done behind a shoreline berm.

Mitigation for aquatic habitat and species will be in the form of minimizing impacts (eg, time restrictions for dredging, berms, placement of bulkheads, if necessary, along the south shore).

Phased development would begin along the north shore, thus delaying impacts to more valuable habitat. A phased mitigation program would allow for corrective action as well as time for new habitats to become established.

General on-site and off-site mitigation measures are discussed in Section 4.4. The location and details of a mitigation program depend on the final master plan approved for West Hayden Island. Specific habitat restoration objectives, including wetlands and riparian habitats, activity scheduling, evaluation criteria, and mapping, would be developed during the mitigation plan design process. An approved mitigation plan will be a condition of the permit. The EPA will have an opportunity to review the draft mitigation plan.

Department of Fish and Wildlife
506 S.W. MILL STREET, P.O. BOX 3503, PORTLAND, OREGON 97208

November 12, 1985

Colonel Gary R. Lord
Portland District
Corps of Engineers
P.O. Box 2946
Portland, OR 97208

RE: West Hayden Island - DEIS
Public Notice No. 071-OYA-2-005254

Dear Colonel Lord:

The Oregon Department of Fish and Wildlife has reviewed the Draft Environmental Statement and Permit application for Portland General Electric Company's proposed West Hayden Island Marine Industrial Park in Portland, Oregon.

From the Department's perspective, when fish and wildlife resources are to be significantly impacted or lost completely as a result of needed development, those impacts should be minimized and the losses offset through mitigation. At the same time, the development which does occur should make efficient use of the land so as to reduce future need for additional habitat alteration elsewhere. This approach is particularly important when dealing with the declining riparian, wetland and aquatic resources found in locations having shorelines suitable for water dependent development.

Development Alternative B appears to make maximum use of West Hayden Island for marine terminal use and, therefore, could be supported subject to the conditions described below.

The following factors should be considered as permit conditions:

1) Use of bulkheads or pilings on the Oregon Slough side of Island;

2) Use of piling only on Columbia River side of Island; and,

3) The month of March added to the the time in which dredging activities would not occur.

These mitigation concerns are addressed in Section 4.4. An approved mitigation plan would be a condition of an issued fill permit. See responses to the EPA comments regarding mitigation concerns.

The month of March was added to the dredge timing restrictions in the FEIS.

A specific mitigation plan needs to be developed before permit issuance and should provide:

1) In-kind mitigation for all habitat types lost (i.e. willow/ash/cottonwoods, wetland, uplands);

2) A procedure for maintaince of mitigation site beyond project completion; and

3) A provision for monitoring of mitigation effort to ensure in-kind replacement is maintained.

Financial compensation as wetland mitigation and a "Wildlife Habitat Superfund", as mentioned in the Draft EIS, are concepts that the Department would be willing to explore in more detail once development permit conditions are agreed upon.

Financial compensation for habitat losses will not be pursued by the applicant. Therefore, this mitigation alternative is not carried forward in the FEIS.

In conclusion, Department personnel have participated fully in the HEP analysis with regard to a mitigation plan. We will continue that participation and look forward to a review of the completed mitigation plan.

Sincerely,

Michael C. Weland
Chief
Environmental Management Section

mws

c Columbia Region
Pesek
Bennet
Beidler
Coenen

PSD009506

NORIA BEATTY RINGER
Director

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

November 12, 1985

Gary Lord, Colonel
Portland District
U.S. Army Corps of Engineers
P.O. Box 2946
Portland, Oregon 97208

ATTN: NPPPL-NR-EQ

Dear Colonel Lord:

Thank you for the opportunity to comment on the draft environmental impact statement for the West Hayden Island Marine Industrial Park, Portland, Oregon. We reviewed the EIS and have the following comments.

The industrial waste water and sanitary sewage collection and treatment facilities are not discussed in detail in the EIS. It is imparative that this subject be addressed since it is a critical part of the proposed project. Adequate collection and treatment of wastes must be assured.

If you have any questions, please call Mr. Jon Neel of the Southwest Regional Office at (206) 753-0144.

Sincerely,

Barbara J. Ritchie

Barbara J. Ritchie
Environmental Review Section

BJR:

cc: Jon Neel

Section 4.3.4 and Table 4.3-III address wastewater and sewage treatment services proposed for West Hayden Island. Existing facilities on Hayden Island would be adequate to handle wastes. If annexation with the City of Portland occurs, extension of city services provides another alternative.

AUDUBON SOCIETY OF PORTLAND

A Branch of National Audubon Society

PHONE 292-6855 5151 NORTHWEST CORNELL ROAD PORTLAND, OREGON 97210

November 17, 1985

District Engineer
U. S. Army Corps of Engineers
Portland District
Attn: NPPPL-NR
P. O. Box 2946
Portland, Oregon 97208-2946

Regarding Draft Environmental Impact Statement, West Hayden Island Marine Industrial Park, Portland, Oregon 1985
PGE Permit Application No. 071-OYA-2-005254

I would like to submit the following comments on the Draft EIS on behalf of the Audubon Society of Portland. We have been involved in reviewing PGE's plans for industrial development of west Hayden Island for more than two years and have submitted testimony before Multnomah County and City of Portland Planning Commissions. These comments are a continued effort to address the significant environmental impacts which would occur on the island if the development were to occur.

My first comment involves statements made on page -i-: "up to 67 acres of wetlands would be filled, requiring off-site mitigation; terrestrial habitat and cottonwood-ash riparian habitat would also be filled..." Throughout our participation in the HEP analysis of the island to determine baseline habitat values it has been understood that off site mitigation, which is preferred by the HEP team, would be not only for wetlands, but also include the alteration of other habitat types, specifially the cottonwood-ash riparian habitat. I feel this is a significant point that should be addressed at all times in the enviromental impacts statement. Page IV-20 states this very clearly..."The results of the HEP committee work will be used to document the value of existing wetlands and other habitat on West Hayden Island and provide a basis for mitigation planning and implementation." PGE has made a commitment since the inception of this project that, should a permit be granted, they would be involved in compensation of habitat values that would be lost, including cottonwood-ash riparian habitat and that there would be no net loss of wetland habitat by area.

Mitigation will include wetland loss compensation as well as riparian habitat replacement (Section 4.4).

Since there is no mitigation program which has been developed at this time I cannot comment on the merits of any off site project. The Environmental Impact Statement should be reviewed without regard to whether mitigation is feesible or desireable and a permit issued or denied on that basis. We feel strongly that the willingness to undertake a migitigation program should not be a factor in reaching that decision. Portland Audubon Society has worked closely with PGE staff and resource agencies to develop and carry out a HEP analysis and we are committed to continue that process through development of a mitigation program. However, we view this as a separate process that will be considered after issuance or denial of their permit. It is our understanding at this time that it is EPA and Corps policy not to issue a permit with an established mitigation program as a reason for that issuance.

Although the willingness of the applicant to implement a mitigation program will not be the only factor for a permit decision, it can be taken into consideration in making a final decision.

Page -x- "...The proposed development would also include construction of a bridge over the Oregon Slough..." An indirect impact of this bridge construction is how it ties in with realignment of Marine Drive. At this time there are two alternative routes, one of which would impact wetlands, West Delta Park and an established Great Blue Heron rookery. If PGE's perferred bridge connection to the new Marine Drive

No decision has been made concerning bridge location. Its ultimate placement would depend on the development alternative approved, alignment of Marine Drive, and factors brought forth during the U.S. Coast Guard bridge permit process.

realignment were to influence the choice of the southern route in our opinion there would be substantial off site impacts that must be addressed. We would be interested in seeing a statement by PGE which describes their preferred bridge alignment and whether their proposed project would benefit from either alignment.

Page -xi-: "Biological Effects....develop a mitigation plan for the wetlands which would be filled..." I offer the same comment as my previous one regarding mitigation, PGE has pledged mitigation for more than the 67 acres of wetland habitat that would be destroyed. There has been a commitment for mitigation of riparian habitat loss as well. This statement should accompany any mitigation discussion in the final EIS.

Mitigation will include wetland loss compensation as well as riparian habitat replacement. Mitigation measures discussed in Section 4.4 include actions for loss of riparian habitat.

Page -xi-: "The City of Portland and the Federal Highway Administration are developing plans for the extension of North Marine Drive..." Again, the bridge connection that PGE will be seeking will have potential major off site impacts on wetlands and a Great Blue Heron rookery.

The proposed bridge can be adapted with either the north or south Marine Drive alternative. The exact location has not been determined at this time. Any potential impacts will be addressed in detail in an EIS supplement or EA during the Coast Guard bridge permit process.

Page -xii-: Areas of Controversy and Unresolved Issues: As pointed out earlier, although we agree that, should a permit be issued, off site mitigation is the only feasible alternative to compensate for habitat losses. However, the applicant does not state explicitly under "unresolved issues" that mitigation will be for more than wetlands: "To assess and quantify the biological values of the wetlands which would be lost...off-site mitigation appears to be the only feasible alternative." Again, the HEP analysis was for all habitats, not just wetlands.

Cottonwood/ash riparian habitat has been added to areas of controversy.

Page I-1: "This development would meet community needs and provide PGE stockholders with a reasonable financial return on the property." What is a "reasonable" financial return on the property? There are no figures in the draft EIS which show what PGE paid for the Hayden Island property which should have some bearing on what return was "reasonable." The company acquired this land prior to its inclusion in the urban growth boundary and that land was zoned farm and forest. The stockholders could have received a "reasonable" return on their invenstment without rezoning and development to marine industrial. It is not necessary to totally eradicate the important cottonwood-ash riparian habitat and wetlands on the island to meet a "reasonable" retrun expectation for PGE shareholders. I believe this argument is specious. Portland Audubon Society opposed Multnomah County approval of a UGB amendment which allows urban uses.

The primary purpose of this project is to provide land for growth in the marine industrial section of Portland. The need for this site is documented in Section 1.2.

Page III-9: 3.2.1 Terrestrial Species and Habitat, A. Vegetation:
It is stated that "The cottonwood /ash habitat on West Hayden Island, therefore represents approximately 2 percent of similar habitat located along the lower Columbia River."
The implication of this statement is that there is very little, only 2%, of this habitat type and, therefore, the impact will be minimal. I dispute this statement and refer to a U. S. Army Corps of Engineer's study conducted by the Oregon State University cooperative research unit which conducted a riparian habitat study of the Columbia and Snake River systems. In that study it was determined that there were higher total numbers of bird species censused than in any other habitat studied. That this habitat type was rapidly disappearing and that no one knows how much is left. Cottonwood/Ash bottomland habitat is sensitive and rapidly diminishing throughout the Columbia River system. This is one of the most significant biological issues associated with the proposed project. I challenge the implication that it is of minor importance on Hayden Island. The applicant states later on this page that "Because wetlands are of special public concern and require Corps permit to be filled, they will be discussed separately in section 3.2.2." I feel an analysis of the significance of cottonwood/ash riparian habitat is of equal importance on West Hayden Island.

The U.S. Army Corps of Engineers study (1976) of riparian habitat along the Columbia River estimates 9,276 acres of similar wooded habitat exist between RM 79 and RM 145. This figure does not include riparian habitat 10 feet above the elevation of ordinary high water level. Significantly more acreage of undeveloped land with characteristics similar to West Hayden Island exists between Sauvie Island, the mouth of the Sandy River, and the lower Willamette River from Ross Island (Section 3.2.1.A).

Page III-24: North Portland: We would agree with the statement that there is a strong neighborhood association. However the neighborhood's interests lie not only with economic development. Recent surveys indicate that north Portland residents place a great deal of importance on retention of open space and wildlife habitat. This is not indicated in the EIS. The occurrence of the visual qualities, wildlife habitat and open space represented by West Hayden Island are significant factors which must be addressed when assessing relative values to the local neighborhoods.

The local neighborhood has supported the project and raised no issues during the DEIS process. Their primary concerns are with the Smith-Bybee lakes area.

Page III-38: Marine Drive: I would state again that PGE's interests in which alignment is pursued (north or south) is a significant off site impact, since a southern alignment will impact wetlands, West Delta Park and an active Great Blue Heron rookery.

See earlier response on this issue.

Page III-43: 3.3.8 Recreation: "No ecologically or scientifically significant natural areas, wilderness or historic and cultural sites have been identified..." This is not correct. By what definition is West Hayden Island not ecologically or naturally significant? Portland Audubon Society has maintained throughout the county and city hearings process that Hayden Island is extremely significant wildlife habitat. The "Inventory Of Riparian Habitats and associated wildlife along Columbia and Snake Rivers", U. S. Army Corps of Engineers North Pacific Division, 1976, clearly points out the significance of this habitat type and the fact that it is rapidly disappearing. The report states: "some of the riparian habitats sampled had the highest densities ever recorded for bird communities. Ten of the areas censused had 1,000 or more birds per 100 acres during the breeding season, and four of these had densities which exceeded 1,500 birds per 100 acres. Densities during the non-breeding season were frequently higher than those observed during breeding season..." A letter written by U. S. Fish and Wildlife, dated Feburary 26, 1982 states, "While we agree that the wildlife habitat on the western end of Hayden Island is not now unique or critical, it is becoming unique due to its scarcity. This is the only large parcel of riverine riparian habitat remaining in the Portland metropolitan area which is accessible and close to population centers."
The most significant statement in the Corps study, as I have pointed out earlier, is that no one seems to know just how much of this habitat type we have left.

Section 3.3.8 of the FEIS on recreation does not include a statement on the biological significance of the site. However, there are no formally designated scientific, natural, or wilderness areas on West Hayden Island. West Hayden Island remains inaccessible to the public.

Pages IV-20 and IV-21, Mitigation Alternatives: These two pages mention only wetland mitigation. As has been pointed out earlier in this analysis,PGE has pledged to address loss of cottonwood/ash riparian habitat as well. The understanding at each of the HEP meetings, including the last one, is that mitigation, should a permit be issued, will include mitigation for lost cottonwood/ash riparian habitat. We want to see that stated in the Environmental Impact Statement.

Section 4.4 addresses mitigation for riparian habitats.

We agree with the applicant that, should a permit be issued, the preferred compensation option would be an off site one. It is important to note, however, that this must involve more than mere acquisition of existing wetlands and cottonwood/ash riparian habitat. Throughout the process Smith-Bybee Lakes have been noted as the applicant's preferred mitigation site. There are already excellent wetland/riparian habitats associated with this 1,200 acres lake system. For mitigation options to be acceptable either new wetlands and associated riparian habitat will need to be created or the existing habitat will have to be significantly improved. It is important that this be done for wildlife, not for human uses. Smith and Bybee Lakes has significant recreational potential and is already used for illegal hunting and orv "recreation." If the objective is to create improved wildlife habitat then the potential for human incursion into the areas that are being "created" or improved needs to be addressed. The acquisition of "migtigation rights" or a lease on public land (City of Portland park bureau land for instance) for wildlife habitat mitigation is questionable since the park bureau will undoubtedly be under public pressure to make it available for human use. Any mitigation plan must take this factor into consideration. The best manner to do this is participation in an integrated management plan for the Smith and Bybee system with the city of Portland, Port of Portland and existing private landowners. The priority for land acquisition should be the private lands so they can be brought into public ownership and dedicated to wildlife uses which

The intent of the mitigation plan will be for compensation of wildlife habitat losses and not for increased recreational opportunities. No recreational development will be included in the mitigation plan.

would be compatible with an overall Smith-Bybee management plan.

Appendix C: The Nature Conservancy: Portland Audubon Society has provided a number letters over the past three years regarding the significance of West Hayden Island for nongame wildlife. The inclusion of a letter from The Nature Conservancy which states, "we do not believe that there is a high potential of finding significant natural features in the area." is misleading. The Nature Conservancy has very narrow and specific criteria for determination of significance. The fact that there are apparently no T&E species of plants or animals on the site is one level of "significance." The Nature Conservancy did not mean to imply in their letter that the overall habitat type that Portland Audubon Society has expressed concern over (wetlands and cottonwood/ash riparian) is not "significant." The EIS should have referenced the numerous letters from Audubon Society of Portland and the letter from U. S. Fish and Wildlife Service referenced earlier in these comments which discussed the importance of cottonwood/ash riparian habitat.

The HEP study results indicate the habitat values and their relative significance for selected evaluation species (Section 3.2.1.C).

Finally, statements PGE has made in print and verbally regarding alternative management scenarios should a permit not be granted need to be clarified. PGE simply states, "If marine industrial development does not occur, then the project site will likely be subject to increased livestock grazing. To improve the capacity for grazing, approximately 150 acres of cottonwood/ash habitat may be removed and converted to pasture or meadow habitat...those wildlife species dependent on cottonwood/ash habitat would be negatively impacted." (statement in HEP document, October, 1985). No Action Alternative in the Draft EIS states: "If the permit is denied and the site is used for agriculture or silviculture, removal of vegetation associated with these activities could alter existing wildlife habitat."

Expanded grazing activity is the most likely foreseeable use of the applicant's property if the permit is denied. The Corps has no authority to require habitat protection outside of the limits of its regulatory (permit) jurisdiction. This does not preclude PGE from implementing habitat protection measures on its own.

There are two important points to be considered in these and some less subtle statements made by the applicant. The first is the implication that "if we don't get our permit, we're going to degrade the habitat anyway", therefore you might as well go along with the process and get the best habitat mitigation you can hope for as part of the permitting process. The second is that the proposed development of marine industrial uses will will actually benefit wildlife since continued agriculatural and sivicultural practices will likely degrade wetlands and cottonwood/ash riparian habitat. We would like to see included in the final EIS an analysis of projected agricultural and sivilcultural practices and documentation of why PGE could not include significant wildlife habitat protection compatible with these practices.

Portland Audubon Society continues to be opposed to the intensive uses and attendant habitat disruption and loss requested by the applicant. We continue to regard this habitat as being a significant natural resource which is decreasing rapidly in our region. We also continue to urge that, should the applicant prevail in obtaining a permit, a complete mitigation plan (approved by U. S. Fish and Wildlife, EPA, the U S Army Corps of Engineers and Oregon Department of Fish and Wildlife)be developed, with input from interested parties, that will be phased with project development. This phasing should be done to assure one-for-one habitat value is replaced as the project proceeds. Mitigation should occur on lands acquired by the applicant from non-public sources as close to the project as possible. It is our contention that an obligation exists on the part of public and quasi-public land owners to protect wetlands and significant habitat and open space as part of their management responsibilities. Mitigation should focus on those lands that are not "secured" at this time in an effort to replace wetlands and riparian habitat lost due to private land development.

The public/private ownership status of a piece of property for potential mitigation action will not be a factor in its selection as a mitigation site.

We appreciate the opportunity to comment on the Draft EIS and will continue to be involved in issues associated with Hayden Island, including working with the applicant to develop and acceptable mitigation plan. Should any of our concerns need clarification please contact me at Audubon (292-6855) or home (224-1004)

Sincerely,

Michael C. Houck

cc OBF NSFWS, DSL,PGE

Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208 - 3621

NOV 18 1985

EVLS
Tract No. VE-30
Ross-St. Johns No. 1 and
Ross-Rivergate No. 1 Lines

U.S. Army Corps of Engineers
Portland District
Regulatory Branch
P.O. Box 2946
Portland, OR 97208-2946

Dear Sir or Madam:

Subject: Public Notice of Application for Permit, Reference Number: 071-OYA-2-005254 (Columbia River-Marine Industrial Park)

This is to let you know that, in principle, the Bonneville Power Administration has no objection to the proposed fill. The Portland General Electric Company's fill permit in the vicinity of BPA's towers must provide for tower access and proper fill procedures adjacent to tower footings. In order to be able to do a complete study, BPA will require a detailed drawing showing the elevation of fill and the final elevation. At this point our safe fill elevation is approximately 35.5 feet.

The following are our general comments:

1. A minimum clearance of 15 feet is to be maintained between the conductors (wires) and construction equipment at all times.

2. Access to the transmission line towers and to and along the right-of-way by BPA's maintenance force shall not be interfered with or obstructed.

Sincerely,

/s/ CAROLYN Y. LEE

Carolyn Y. Lee
Realty Specialist
Land Management Unit

cc:
Lynne H. Saxton
Portland General Electric Co.
121 SW. Salmon Street
Portland, OR 97204

The applicant will comply with BPA concerns.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Washington, D.C. 20230

OFFICE OF THE ADMINISTRATOR

November 19, 1985

Mr. Gary R. Lord
Colonel, Corps of Engineers
District Engineer
Department of the Army
P.O. Box 2946
Portland, Oregon 97208

Dear Mr. Lord:

This is in reference to your environmental impact statment for the West Hayden Island Marine Industrial Park Project. Enclosed are comments from the National Oceanic and Atmospheric Administration.

We hope our comments will assist you. Thank you for giving us an opportunity to review the document.

Sincerely,

David Cottingham
Ecology and Conservation Division

Enclosure

N/MB2:CMS

November 15, 1985

TO: PP2 - David Cottingham

FROM: N - Paul M. Wolf

SUBJECT: DEIS 8509.10 - West Hayden Island Marine Industrial Park, Portland, Oregon

The subject DEIS has been reviewed within the areas of the National Ocean Service's (NOS) responsibility and expertise, and in terms of the impact of the proposed action on NOS activities and projects.

Geodetic control survey monuments may be located in the proposed project area. If there is any planned activity which will disturb or destroy these monuments, NOS requires not less than 90 days notification in advance of such activity in order to plan for their relocation. NOS recommends that funding for this project includes the cost of any relocation required for NOS monuments. For further information about these monuments, please contact Mr. John Spencer, Chief, National Geodetic Information Branch (N/CG17), or Mr. Charles Novak, Chief, Network Maintenance Section (N/CG162), at 6001 Executive Boulevard, Rockville, Maryland 20852.

If a permit is issued by the Corps, the applicant will contact NOS regarding the survey monuments. If geodetic monuments must be relocated, the applicant will coordinate and fund the relocation.

OREGON ENVIRONMENTAL COUNCIL

2637 S.W. Water Avenue, Portland, Oregon 97201
Phone: 503/222-1963

November 20, 1985

District Engineer
U.S. Army Engineers District, Portland
Attn: NPPPL-NR
P.O. Box 2946
Portland, OR 97208-2946

Subject: Draft EIS
West Hayden Island Marine Industrial Park

District Engineer:

The following comments on the Draft Environmental Impact Statement for the proposed West Hayden Island Industrial Park are submitted on behalf of the Board of Directors of the Oregon Environmental Council.

The Draft EIS has not, in our opinion, been prepared in compliance with the National Environmental Protection Act and must be revised in the following critical areas:

1) As stated in the DEIS, the Multnomah County Comprehensive Plan designates West Hayden Island as an urban area suitable for marine industrial development. Multnomah County Ordinance No. 333 (Appendix A-1), redesignating the subject area to "urban," includes the following finding and conclusion:

> Any long term environmental and recreational losses from urban use of this site will be identified and addressed in the Community Planning process for West Hayden Island, the Design Review process, and by meeting requirements of the Significant Environmental Concern (SEC) overlay zone. Buffer zones, open areas and other appropriate measures will be provided to preserve and maintain fish and wildlife habitats of the area, wherever possible.

Ordinance No. 334 (Appendix A-1), adopting growth management policies to guide development of the subject area, cites the following criteria:

> The need to protect special environmental features such as wildlife habitat or natural shoreline will be balanced with development requirements. This is necessary to protect existing public and private investment in the community while helping maintain natural environmental resources and values, where possible.

and:

> Any environmental hazards, such as to fish and wildlife habitat or losses of recreational opportunities will be studied and addressed during the Community Planning process to minimize negative impacts from development. Buffer zones, open areas and other appropriate measures will be considered to preserve and maintain fish and wildlife habitat, in balance with economic and social benefits resulting from development.

The DEIS includes no discussion of these requirements. Rather, a generic finding of compliance with the County's Comprehensive plan, as acknowledged by the Oregon Land Conservation and Development Commission, is asserted. The site development plan analyzed in the DEIS would not comply with these requirements.

The project appears to comply with the local land use plans as discussed in Sections 3.3.1.C and 4.3.1.C. If a Corps permit is issued, it will be conditional upon the applicant's receiving all other appropriate federal, state, and local permits and approvals. The issues in the comprehensive plan would be addressed by the County as part of their review process.

2) The DEIS considers only two alternatives, a no action alternative and the applicant's proposed development plan. Alternative site development plans were rejected because they were judged to not provide PGE stockholders "with a reasonable financial return on the property." Stockholder profit is not a NEPA criteria. The DEIS must consider all reasonable site development options, including those which propose less development of the site.

The EIS addresses alternative plans for site development which would meet the applicant's stated purpose and need. Alternatives which do not meet the applicant's need are not reasonably foreseeable and, therefore, are not discussed in detail.

3) Mitigation cannot be a factor in the issuance of the requested permit. The project must be judged on its merits, not on the willingness of the applicant to establish a HEP committee or on the viability and desirability of a particular mitigation program.

While the applicant's willingness to mitigate will not be the only factor in deciding whether to issue a permit, it can be taken into consideration in making a final decision.

4) The discussion of mitigation included in the DEIS focuses only on off-site mitigation. On-site mitigation must be fully examined and found to be completely infeasible before off-site mitigation can even be considered.

The discussion of mitigation has been expanded in the FEIS to include on-site mitigation. Mitigation actions for both on-site and off-site opportunities are discussed in Section 4.4.

5) The discussion of mitigation also focuses only on the 67 acres of wetlands proposed to be filled. The alteration and loss of other significant habitat must also be addressed through mitigation plans. It is not acceptable to limit mitigation efforts to only the affected wetlands. The DEIS should be amended to address compensation of all habitat values lost, including cottonwood and riparian habitat.

Riparian habitat as well as wetlands are to be considered in the developed mitigation plan.

6) Mitigation must result in no net loss of habitat values. Off-site mitigation, if approved, must result in the acquisition, protection and long-term maintenance of new habitat areas. It is not acceptable to simply enhance existing habitat areas.

7) Alignment of a proposed bridge over Oregon Slough to the subject area impacts both habitat on the island and realignment of Marine Drive. The DEIS should include a detailed analysis of these impacts.

The location of the proposed bridge will be determined by the location selected for the realignment of Marine Drive. The environmental impacts of the bridge will be analyzed in a separate EIS supplement or Environmental Assessment as plans are developed.

Thank you for this opportunity to comment. We look forward to being involved in the resolution of the above issues and in further discussions about future development of West Hayden Island.

Sincerely,

Jim Owens, President
Board of Directors

cc: Ron Bierly, Division of State Lands Ronald Klein, PGE

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

NOV 20 1985

REPLY TO ATTN OF: M/S 423

Colonel Gary R. Lord
District Engineer, Portland District
Corps of Engineers
P. O. Box 2946
Portland, Oregon 97208

RE: 071-OYA-2-005254, Portland General Electric Company, September 27, 1985

Dear Colonel Lord:

We have reviewed the referenced public notice concerning the development of a marine industrial site on West Hayden Island in the Columbia River near Portland, Oregon. We have enclosed a copy of our comments on the Draft Environmental Impact Statement (DEIS) in support of our recommendations in this letter.

We are not opposed to the use of this site for water-dependent marine industrial development provided this activity meets the needs and alternatives requirements of the 404(b)(1) Guidelines and appropriate mitigation is made a condition of the 404 permit. Additional information is required before compliance with the 404(b)(1) Guidelines can be determined (see enclosure). A mitigation plan acceptable to the state and federal resource agencies must also be developed before EPA can agree to permit issuance.

If compliance with the 404(b)(1) Guidelines is established, we recommend the Corps permit this project in stages. Lesser value habitat should be filled first, saving the wetland and riparian areas until they are needed. Mitigation for this development should begin immediately upon issuance of this permit as it will take several years to establish the cottonwood/ash habitat.

These issues should be resolved in the Final Environmental Impact Statement (FEIS) before the Corps considers issuing a Section 404 or Section 10 permit. We recommend the Corps not take action on this permit until the FEIS has been issued and the environmental concerns of the resource agencies have been resolved.

We understand this procedure is acceptable to the Corps. If the Corps intends to issue a permit for this project without incorporation of our recommendations, we request prior notification.

For further coordination on this project, please contact Mr. Gary Voerman of my staff at FTS 399-8513 or (206) 442-8513.

Sincerely,

Ernesta B. Barnes
Regional Administrator

Enclosure

cc: USFWS-Portland
NMFS
ODFW
ODSL

Results from the HEP study and impact analysis will provide a basis for mitigation plans (Sections 3.2.1.C and 4.2.1.C). Mitigation measures to be taken are addressed in Section 4.4. The multiagency HEP committee will adopt a mitigation plan for review and approval. An approved mitigation plan will be a condition of the fill permit.

The proposed project and mitigation activities would be implemented in phases if a permit is issued. Filling would begin along the northern portion of the site to delay impacts to more valuable habitats.

The decision to issue or deny the permit will not be made until the NEPA process is completed.

Port of Portland

Box 3529 Portland, Oregon 97208
503/231-5000
TWX: 910-464-6151

November 20, 1985

Colonel Gary R. Lord
Attn: NPPPL-NR-EQ
Department of the Army
Portland District
Corps of Engineers
P.O. Box 2946
Portland, OR 97208

Dear Colonel Lord:

The Port of Portland supports the designation and development of West Hayden Island for marine industrial use (Permit Number 071-0YA-2-005254). However, we want to ensure that Hayden Island's development does not adversely impact Port properties, especially Rivergate.

Traffic generated from developing Hayden Island will affect traffic on Interstate 5 and in north Portland. Key impact areas and construction projects should be designed to handle this future growth. For example, the possible locations of a new bridge crossing the Oregon Slough to Hayden Island should be well coordinated with the current Marine Drive realignment project.

As long as the impact of Hayden Island's development on the area is anticipated, minimized, and planned for, the Port will look forward to the addition of marine industrial land in Portland Harbor.

Sincerely,

Dennis L. West
Deputy Executive Director

01L315

PSD006517

The location of the proposed bridge would be determined by the location selected for the realignment of Marine Drive.

Northwest Environmental Defense Center
10015 S.W. Terwilliger Blvd., Portland, Oregon 97219
(503) 244-1181 ext.707

November 20, 1985

U.S. Army Corps of Engineer
Portland,District
Regulatory Branch
P.O. Box 2946
Portland, Or. 97208-2946

Re: 071-OYA-2-005254
(Columbia River-Marine Industrial Park) DEIS

The Northwest Environmental Defense Center (NEDC) is a litigation oriented non-profit organization concerned with the responsible development and conservation of the natural resources of the Pacific Northwest.

This letter responds to the Public Notice and Draft Environmental Impact Statement (DEIS) for West Hayden Island Marine Industrial Park by Portland General Electric Company (PGE). Alternatives A, B and D are not acceptable because these proposals fill the entire site and other alternatives are feasible and impact the wetlands situated on Hayden Island less adversely. An Alternatice Plan such as Plan C or a combination of Plan C with Plan D would be feasible and would also comply with the requirements of N.E.P.A. and Section 404 of the Clean Water Act. if modifications such as follow are made to Plan C.

The FEIS evaluates those alternatives which are reasonably foreseeable and meet the applicant's stated purpose and need. Alternative C from the DEIS (open center plan) has not been carried forward for further consideration in the FEIS for reasons cited in Section 2.2.3.

1. Wetlands--Phase development so that existing wetlands and wooded wetlands are filled last. Preserve 14 acres of wetlands and create 56 acres of wetlands in the undeveloped area as on-site mitigation during deve opment, not afterwards. Off-site mitigation should be avoided when on-site mitigation is practical. 40 C.F.R. 230.10.

Phased development would begin along the north shore, delaying the filling of the majority of the wetland habitat.

2. Dredging operations-- Impacts of dredging are to be minimized. This would include no dredging during the spring and fall fish migration, maintain the south shoreline in place while dreging the hole to obtain material, construct berms to contain dredged material at each placement site.

These mitigation measures are proposed to minimize impacts of dredging (Section 4.4).

3. Shallow water habitat-- The permit should require that impacts on this habitat be evaluated and mitigated for each development that occurs in the Marine Park. The impacts should be held to a minimum by requiring all bulkheading to occur on the North Shore unless extraordinary circumstances exist for a particular development. 40 C.F.R. 230.10 (c)(d).

Impacts will be minimized with bulkheading occurring on the south shore in accordance with the U.S. Fish and Wildlife Service recommendations.

4. Other Wildlife Habitat-- Off-site mitigation for loss of wildlife habitat should be required for the 346 acres of wildlife destroyed. Evaluation and approval of an acceptable mitigation plan should occur before development begins and mitigation should be implemented during development. Post permit mitigation planning and post development implementation is not acceptable. The Mitigation Plan should be issued in a new Public Notice along with the preferred alternative, FEIS. 40 C.F.R. 230.10(d).

An approved mitigation plan will be a condition of the issued fill permit. Plan implementation will occur concurrent with development. The plan will not only address wetland value losses but riparian habitat values as well. Proposed mitigation measures were issued in a U.S. Army Corps of Engineers Public Notice on July 30, 1986 (Ref. No. 071-0YA-2-005254) as well as Section 4.4 in this FEIS.

5. In addition hazardous waste should not be stored more than a few days at any site on the developed property.

Hazardous waste management of developed property is beyond the scope of this EIS. Specific users have not been identified. Applicable laws and regulations will apply to the specific users.

Alternative Plan C could also be modified to include a basin. The creation of a basin would achieve the goal of Plan D without filling the entire site and would also allow for on-site mitigation. In addition, a C-D hybrid plan providing for on-site mitigation, would require less fill because material excavated to create the mitigating wetlands could be used as fill.

Again, Plan C or a combination of Plan C-D are the most preferrable at this time because they will minimize impacts, save dredging and filling costs to PGE, provide on-site mitigation that will save PGE and other agencies time and costs and if planned and implemented correctly will comply with N.E.P.A. and the Clean Water Act.

Development plan alternatives other than those considered in the DEIS were considered. The FEIS evaluates those alternatives which are reasonably foreseeable and meet the applicant's stated purpose and need. Alternative C from the DEIS (open center plan) has not been carried forward for further consideration in the FEIS for reasons stated in Section 2.2.3.

NEDC urges the Corps to consider requiring the applicant to modify its proposal so that some wetlands will be maintained on Hayden Island.

Sincerely,

/s/ Helen Kennedy

Helen Kennedy
NEDC

United States Department of the Interior
OFFICE OF THE SECRETARY
PACIFIC NORTHWEST REGION
500 N.E. Multnomah Street, Suite 1692, Portland, Oregon 97232

November 20, 1985

ER 85/1485

Colonel Gary Lord
District Engineer, Portland District
U.S. Army Corps of Engineers
P.O. Box 2946
Portland, Oregon 97208

Dear Colonel Lord:

The Department of the Interior has reviewed the Draft Environmental Impact Statement (DEIS), West Hayden Island Marine Industrial Park, Multnomah County, Oregon. The following comments are provided for your use and consideration when preparing subsequent documents.

General Comments

Cultural Resources

The DEIS does not adequately address either prehistoric or historic cultural resources. The impacts of the proposed project and any mitigation needs cannot be known until the island is professionally surveyed for these resources or until convincing evidence is presented that none are present that might be eligible for the National Register of Historic Places.

We do not believe that it is adequate for the DEIS to state that the requisite cultural resource identification and evaluation will be conducted at some point in the near future, along with consultation with the State Historic Preservation Officer (SHPO). If in fact, portions of the island can be eliminated from survey because of previous disturbance, recency of deposits, or prior investigations, the DEIS should document on a map for the decisionmaker, the specific areas involved, explain briefly the rationale, and reference the opinion of the SHPO.

Fish and Wildlife Resources

Although the statement contains general discussions of existing fish and wildlife habitat and the effect of the proposed action on wildlife, we believe that there are major deficiencies in the statement.

A cultural resources study was completed for West Hayden Island. The results are summarized in Sections 3.3.9, 4.3.9, and 5.2 of the FEIS.

The most significant omission is the lack of a detailed mitigation plan. Although the Habitat Evaluation Procedures (HEP) committee has completed the base evaluation, discussions and work have not yet begun on a mitigation plan. The Department will likely recommend denial of the Corps of Engineers' (Corps) Section 10/404 permit for the proposed action unless an agreed-upon mitigation plan is developed and provided to the public for cottonwood/ash habitat as well as the wetland/riparian habitat. The Fish and Wildlife Service (Service) has classified both habitat types as Resource Category 2 under its Mitigation Policy (Federal Register Vol. 46:15 of January 23, 1981). The designation criteria for Resource Category 2 is that habitat to be impacted is of high value for evaluation species and is relatively scarce or becoming scarce in the ecoregion section. The mitigation goal is no net loss of in-kind habitat value.

Major blocks of forested wetland/riparian habitat have been highly impacted by human activities in the ecoregion. West Hayden Island is one of only two large (over 100 acres) areas of this type habitat remaining in the Portland metropolitan area. The other area is Government Island. Replacement of the forested riparian habitat would be difficult because large parcels of land suitable for producing cottonwood/ash riparian habitat may no longer be available and considerable time would be required to attain a mature stand of trees. Therefore, we believe mitigative actions should begin early enough to insure that replacement trees reach a usable size before the habitat on West Hayden Island is destroyed. Accordingly, the document should be expanded to include a thorough discussion of the need to mitigate for the forested (cottonwood/ash) habitats and the associated difficulties of location and timing.

We believe that the 3 acres of wetland, not currently proposed for mitigation, should be included in the mitigation plan. The Corps' initial Public Notice indicated that the proposed bridge would cross these wetlands; and it is our opinion that its construction and operation would almost completely destroy the wetland's value to wildlife.

The information supplied on the proposed deep draft access channel and turning basin on the north shore of the island is incomplete. More detailed information on the exact location and existing depths is needed to adequately assess impacts on fish. This information has not been made available to reviewers. It appears that the purpose of the proposed dredging is for the acquisition of fill material, and the Department normally recommends that no dredging be allowed above -20 feet for this type of action.

In addition, maintenance dredging would be required for the deep draft channel and turning basin on the north shore and the deep draft channel and basin in Oregon Slough. The statement should contain an estimate of the amount of material to be dredged and a long-term plan for disposal of the material.

All alternatives that would partially or fully meet the need for the action should be analyzed in detail in the EIS. It is indicated that Alternatives A, B, and C were eliminated from consideration for economic reasons. We believe that an environmental analysis of the alternatives should be included in the EIS as well as more detailed information regarding the economic analysis and rationale for eliminating the alternatives.

We also believe that the document should include a discussion of the long- term and short-term effects of the proposed development on the remaining 232 acres of undeveloped land on West Hayden Island.

Mitigation measures that can be taken to minimize impacts of dredge/fill activities and habitat mitigation measures that can be implemented for both on-site and off-site options are discussed in Section 4.4. Results of the HEP study and impact analysis are discussed in Sections 3.2.1.C and 4.2.1.C. The HEP committee is currently reviewing both on-site and off-site actions that address potential wetland and riparian habitat losses. A specific mitigation plan which will include the three acres of wetlands will be developed and approved as a condition of the fill permit. Mitigation plan implementation will be concurrent with proposed phased development of West Hayden Island.

The discussion of the shallow water habitat to be dredged and the expected impacts of that dredging (Sections 3.2.3 and 4.2.2, respectively) has been expanded in the FEIS. The access channel and turning basin would be dredged primarily to provide access to the north shore. Although the dredged material would be used as fill, this is not the primary purpose for dredging these features.

Maintenance dredging is discussed in Sections 2.1.2 and 4.2.2 of the FEIS.

The FEIS evaluates those alternatives which are reasonably foreseeable and meet the applicant's stated purpose and need. Rationale for not carrying forward alternatives from the DEIS are cited in Section 2.2.3.

The development and improved access would likely encourage additional development on the remainder of West Hayden Island, but the specific types of development cannot be predicted at this time. The effect of the proposed project development on wildlife occupying land adjacent to the site is discussed in Section 4.2.1.B.

Specific Comments

Page II-5, para. 2 & 4. The Corps' initial Public Notice indicated that the proposed bridge would cross the 3-acre wetland. Depending upon the type of construction, we believe that all or part of the wetland would be lost and its wildlife values would be greatly reduced. This loss and the need to mitigate for it should be reflected in the document.

Para. 1. The southwest quadrant excavation should not be any deeper than the channel.

Para. 3. The HEP analysis was based on filling in four phases over an 11-year period, with from 86 to 205 acres filled in each phase. Any changes in this development schedule would change the HEP baseline values and mitigation requirements. The development schedule, impacts, and corresponding mitigation requirements should be discussed in more detail in the statement.

Page II-18, last para. It is our understanding that there has been considerable discussion, and some action taken, on growing fast-maturing cottonwood trees for pulp on West Hayden Island. That action should be summarized.

Page II-21, Table 2-6-1. Hydraulic Effects of Dredging. Extensive dredging for fill by the Port of Portland in the proposed project area and immediately downstream have had a noticeable effect on: 1) decreasing the amount of bedload material transported downstream; and 2) increased bank erosion. The proposed dredging for fill could exacerbate these effects and should be addressed in the document.

Terrestrial Species and Habitat. The Department also recommends mitigation for impacted forested habitat.

Page II-22. Aquatic Species and Habitat. Shallow water habitat on the north shore may also be lost. The document should address this potential impact.

Page II-23, Recreational Effects. This section should be expanded to state that other recreational uses, such as hiking and bird watching, would also be lost.

Page III-4, para. 2. The Port of Portland has a permit to dredge to -55 feet in the lower end of the proposed deep draft channel. Since the permit has been valid for over 10 years, it is assumed that depths are greater than the stated 25 to 30 feet. The actual depths should be defined.

Page III-9, 3.2.1.A, para. 1. The area addressed for need of the proposed project is limited to the Portland Metropolitan Area. Accordingly, we believe the habitat comparisons should also be limited to that area. The closest approximation that could be achieved using the cited reference is from River Mile 79 to 145. In this segment there are 882 acres of cottonwood/ash habitat. However, much of this habitat type is in small parcels. Filling the proposed site would result in the loss of 25 percent of that total. As stated earlier, there are few large units remaining. Accordingly, the regional importance of the remaining forested deciduous habitat should be discussed.

Although the exact location of the proposed l ge is unknown, the HEP impact analysis (Section 4.2.1.C) considers all wetland acreage, including the three acres, under each proposed alternative. All three alternatives include phased development actions, and the net changes in Average Annual Habitat Units (Table 4.2-II) reflect these actions.

The area between the excavated basin and the navigation channel in the Oregon Slough would be dredged to the depth of the basin.

See response at the top of this page.

Use of fast-growing cottonwoods on West Hayden Island is summarized in Section 2.4.2.

Proposed dredging is to provide access and a turning basin. No incidental dredging to obtain fill will be done. Dredging impacts to the aquatic environment are discussed in Sections 4.1.3 and 4.2.2.

At this time, the majority of the bed load being transported past Hayden Island is being trapped in the deep dredged area between Hayden Island and Kelly Point. Very little Columbia River bed load material is being transported past Kelly Point. The proposed Hayden Island dredging work will have minor or no impact on the downstream conditions.

We have no evidence to indicate that decreasing the bed load by dredging will result in increased bank erosion. Additional scouring of bottom material would more likely replace the sediment.

Specific Comments

Page II-5, para. 2 & 4. The Corps' initial Public Notice indicated that the proposed bridge would cross the 3-acre wetland. Depending upon the type of construction, we believe that all or part of the wetland would be lost and its wildlife values would be greatly reduced. This loss and the need to mitigate for it should be reflected in the document.

Para. 1. The southwest quadrant excavation should not be any deeper than the channel.

Para. 3. The HEP analysis was based on filling in four phases over an 11-year period, with from 86 to 205 acres filled in each phase. Any changes in this development schedule would change the HEP baseline values and mitigation requirements. The development schedule, impacts, and corresponding mitigation requirements should be discussed in more detail in the statement.

Page II-18, last para. It is our understanding that there has been considerable discussion, and some action taken, on growing fast-maturing cottonwood trees for pulp on West Hayden Island. That action should be summarized.

Page II-21, Table 2-6-I. Hydraulic Effects of Dredging. Extensive dredging for fill by the Port of Portland in the proposed project area and immediately downstream have had a noticeable effect on: 1) decreasing the amount of bedload material transported downstream; and 2) increased bank erosion. The proposed dredging for fill could exacerbate these effects and should be addressed in the document.

Terrestrial Species and Habitat. The Department also recommends mitigation for impacted forested habitat.

Page II-22. Aquatic Species and Habitat. Shallow water habitat on the north shore may also be lost. The document should address this potential impact.

Page II-23. Recreational Effects. This section should be expanded to state that other recreational uses, such as hiking and bird watching, would also be lost.

Page III-4. para. 2. The Port of Portland has a permit to dredge to -55 feet in the lower end of the proposed deep draft channel. Since the permit has been valid for over 10 years, it is assumed that depths are greater than the stated 25 to 30 feet. The actual depths should be defined.

Page III-9. 3.2.1.A. para. 1. The area addressed for need of the proposed project is limited to the Portland Metropolitan Area. Accordingly, we believe the habitat comparisons should also be limited to that area. The closest approximation that could be achieved using the cited reference is from River Mile 79 to 145. In this segment there are 882 acres of cottonwood/ash habitat. However, much of this habitat type is in small parcels. Filling the proposed site would result in the loss of 25 percent of that total. As stated earlier, there are few large units remaining. Accordingly, the regional importance of the remaining forested deciduous habitat should be discussed.

Mitigation plans will address riparian habitat losses.

This impact is addressed in Table 2.6-I and Section 4.2.2 of the FEIS.

Recreational impacts are addressed in Section 4.3.8. Because public access to West Hayden Island is strictly controlled, losses of recreational opportunities are limited.
Dredging on the deep draft channel is to provide ships access to the north shore. Areas already dredged to -55 by the Port will not need to be dredged.

Section 3.2.1.A discusses habitat features in relation to similar habitat between RM 79 to RM 145 as well as habitat above the ordinary high water level between Sauvie Island and the mouth of the Sandy River and the Lower Willamette River from Ross Island to the mouth. Black cottonwood and Oregon ash are dominant species on West Hayden Island; therefore, the habitat is described as a cottonwood/ash community. Other woody species occur on-site, including willow. Between RM 79 to RM 145, about 9,276 acres of various forms of riparian habitat similar to that which exists on West Hayden Island occurs (Corps, 1976). The West Hayden Island wooded habitat, therefore, represents about 3 percent of this total.

Page III-13. Table 3.2-II. As with terrestrial habitat, the area of wetland habitat comparison should be limited to the Portland Metropolitan Area. In the RM 79-145 segment, there are a total of 3,824 acres of wetland vegetation. Wetlands that would be lost due to the proposed project would be 2 percent of that total. The document should contain this information.

Wetland descriptions are found in Section 3.2.2 and incorporate your suggested data.

Page III-17, para. 3. Statements related to sockeye runs should be updated in light of recently increased runs. There was a substantial Indian commercial fishery on sockeye in the Columbia River in 1985. This paragraph should be expanded to include that information.

Section 3.2.3.A include additional information about sockeye, chum salmon, and walleye in the Columbia River.

Para. 4. This paragraph should be expanded to include the following information: There are very few streams supporting native runs of chum salmon in the Columbia River. Two major spawning streams, Hardy and Hamilton Creeks, are upriver from Hayden Island. There is an expanding commercial chum fishery in the Columbia River Estuary. Washington, Oregon, and local interests have put considerable time and money into augmenting chum stocks in the estuary. There is a private hatchery in Baker Bay and an Oregon State hatchery on a Young's River tributary that raise chum and support stocking programs in other streams.

Page III-19, para. 2. This paragraph should contain the following information: Walleye have been caught downstream from the project site and populations probably occur near Hayden Island.

Page III-20, para. 1. The benthic invertebrate analysis is incomplete. Appendix C-8 should include information to at least the generic level for amphipods and pelecypoda. This information is required to adequately assess the effects of the proposed project on fish.

Benthic invertebrate analysis (Section 3.2.3.B and Table 3.2-VII) is sufficient to determine relative impacts from the various proposed development alternatives.

Para. 2. More detailed information should be provided on sediment data. Percentages of grain sizes (clay, silt, sand, etc.) should be provided for each of the samples.

Page IV-2, Fill Material Sources No Action. We disagree with the assumptions contained in this section. To the best of our knowledge, the Corps has not used the West Hayden site since 1977. Dredging requirements in this reach of the river have decreased greatly in recent years and it is not expected that this site would receive much use. Accordingly, we do not believe it should be assumed that the Corps would eventually fill the site with dredge spoil. This section of the statement should be changed to reflect this information.

The Corps used the site for dredge material disposal in the fall of 1986. If the permit is denied, West Hayden Island will continue to be a designated disposal site for maintenance dredge material from the Columbia River. The expected level of its use cannot be predicted at this time.

Page IV-4, 4.2.1B. para. 1. It should be clearly stated that wildlife populations that depend on habitat in the proposed project site would be lost. Mitigation should be accomplished prior to project construction, not "ultimately."

Section 4.2.1.B addresses wildlife losses on West Hayden Island in respect to four alternative actions. Wildlife would be lost as a result of habitat destruction. Off-site mitigation would be provided for these losses.

Page IV-4, para. 5. The HEP process was used to evaluate the project site for great blue heron nesting potential, as related to optimum nesting habitat. However, feeding habitat was not evaluated, but should also be considered. Loss of the cottonwood trees would be a significant impact as there are few large, undisturbed stands remaining in the area. This should be stated and discussed in more detail in the document.

Results of the HEP study and impact analysis, including the Great Blue Heron, are discussed in Sections 3.2.1.C and 4.2.1.C. The HEP model considers feeding areas in its analysis.

Page IV-5, 4.2.2, para. 1. We do not agree that there would be benefits to aquatic species from the project, as proposed. Accordingly, we suggest that such statements be deleted from the document or that supporting evidence be provided.

Alternatives A and B propose the dredging of a 64- or 40-acre basin, respectively, along the Oregon Slough. This would create additional warmwater fish and sturgeon habitat.

Page IV-7, last para. We do not agree that a 45-foot hole is "excellent" habitat for warmwater species. The only fish species that might benefit would be sturgeon. Juvenile salmonids only use the upper 20 feet or so of the water column. Juvenile fall chinook which could possibly use the area for rearing are normally found in water depths from 0 to 6 feet and would not be using a 45-foot-deep hole. Smolts that migrate as yearlings (spring chinook, coho, sockeye, and steelhead) use deeper water (up to -20 feet) but usually move through rapidly. Accordingly, we believe the document should state that juvenile salmonids would probably not utilize these habitats.

Section 4.2.2 evaluates impacts to fish, incorporating your suggestions. For aquatic habitat and species, mitigation will be in the form of minimizing those impacts.

Page IV-8, para. 3. We believe juvenile salmonid use of Oregon Slough is minimal and that it is not used as a rearing area. We believe that the north shore habitat is more suitable for juvenile salmonid use. This should be reflected in the document unless you have evidence to suggest otherwise.

Para. 4. We do not believe that the 65-acre, 45-foot-deep lagoon would compensate for loss of shallow water (0 to 20 feet) habitat normally used by juvenile salmonids. Accordingly, other compensation for that habitat loss should be developed. These issues should be discussed in the document.

Last para. We consider potential impacts on salmonids to be more severe on the north shore. Proposed bulkheads would increase adverse effects and we would generally oppose this type of construction.

Page IV-9, 4.2.3, para. 1. Mitigation should be completed and functioning as a mature system before the site is developed. The document should include detailed discussions of all agreed to mitigation measures, costs, locations, schedules, monitoring, and the parties responsible for operation and maintenance.

Such a detailed discussion of mitigation plans is beyond the scope of this FEIS. A detailed mitigation plan will be developed if the permit is issued by the U.S. Army Corps of Engineers. A permit would specifically identify an approved action from which a mitigation plan could be based. An approved mitigation plan would be a condition of the fill permit.

Page IV, 20. Mitigation Alternatives. This section is incomplete and inadequate. We believe that a supplement to the DEIS should be developed for public review after an acceptable mitigation plan has been developed. Currently, only baseline conditions at the proposed site have been identified. Potential mitigation sites should be identified, baseline conditions determined, and possible management actions investigated, before a mitigation plan can be developed and presented for public review. We believe that enhancement possibilities at locations such as Smith and Bybee Lakes are somewhat limited, rather than "significant." Mitigation may also be required for loss of shallow water habitat, depending on the exact location of the deep draft channel. This information is not now available.

See Section 4.4 for a discussion of proposed mitigation measures.

Page IV-21, last para. We do not consider the referenced "financial compensation" as an acceptable mitigative measure to offset unavoidable impacts to resources under our legal responsibility or concern.

Although a regional system of financial compensation for habitat losses could be developed given appropriate legislative support and authority, this mitigation alternative was deleted from the FEIS.

Questions concerning our comments on fish and wildlife resources may be directed to:

Russell D. Peterson
U.S. Fish and Wildlife Service
Ecological Services
727 N. E. 24th Avenue
Portland, Oregon 97232
Phone: (503) 231-6179
FTS 429-6179

Summary Comments

To resolve the issues identified above, the Department recommends that a supplement to the DEIS be developed that discusses in adequate detail the value of and potential impacts to cultural, fish, and wildlife resources and includes a detailed and approved mitigation plan that would identify and offset unavoidable impacts. Unless this information is provided for public review prior to the completion of the decisionmaking process, it is likely that the Department would recommend denial of the necessary Corps permits required to implement the project.

Thank you for the opportunity to comment on this DEIS.

Sincerely,

Charles S. Polityka
Regional Environmental Officer

All comments have been considered and included in this FEIS. This document is subject to agency and public review prior to completion of the decision-making process.

The Wetlands Conservancy

22 November 1985

RECEIVED
NOV 22 1985
REGULATORY FUNCTIONS BR.

District Engineer
U.S. ARMY CORPS OF ENGINEERS
P.O. Box 2946
Portland, Oregon 97208

Re: Portland General Electric Permit Application #071-OYA-2-005254
Draft Environmental Impact Statement Review

Dear Sir:

The Wetlands Conservancy is a non-profit, publicly supported corporation concerned with the preservation of wetlands and related wildlife habitat within the State of Oregon.

Portland General Electric's proposed West Hayden Island industrial development concerns us for obvious reasons and the Draft E.I.S., as presented, does not satisfy our concerns for loss of continually diminishing wetland and riparian habitat in the greater Portland area.

While mitigation for the destruction of habitat is supposed to have no bearing on the E.I.S. review process, it surely becomes a factor in the application for and granting of a fill and removal permit. Without firm guarantees of complete habitat replacement, the Wetlands Conservancy would most certainly oppose the entire West Hayden Island development. As it is, we have to consider it as still another loss of shrinking wildlife habitat in the name of "progress", however that may be defined. Since on-site mitigation appears virtually impossible given the intense heavy industrial nature of the proposed development, we have to settle for off-site mitigation of a meaningful nature, not simply the cosmetic "improvement" of some existing wetland or riparian habitat elsewhere in the Portland area.

The Draft E.I.S. is deficient in our view since it discusses only the two extremes of no-build or a plan with the greatest economic benefit to the applicant. Wildlife is a public resource which deserves better than to be eliminated for private gain. Therefore, mitigation for the cottonwood/ash upland loss as well as the 67 acres of wetland must be accomplished as a condition for future issuance of any permits under Section 404 and should therefore be adequately addressed in the Final E.I.S

Contrary to the statement on Recreation (3.3.3), the West Hayden Island area is very important in wildlife habitat as documented in the Corps of Engineers' 1976 inventory of riparian habitats along the Columbia and Snake rivers. This island habitat, due to its present remoteness from human activity, is extremely valuable and mitigation for its destruction should provide a larger area, if necessary, to support the bird populations now using the island. The Final E.I.S. should address the support of equal populations, not just the replacement of equal area.

Post Office Box 2.

PSD009527

The discussion of alternatives has been improved in the FEIS and includes three development alternatives as well as the no action alternative. Mitigation would be provided for both the wetland habitat and cottonwood/ash habitat as discussed in Section 4.4. The mitigation plan would be based on the results of the HEP study (Sections 3.2.1.C and 4.2.1.C) and developed in cooperation with the interagency committee which conducted the HEP analysis.

As mentioned earlier, the concept of a mitigation plan which only improves 67 acres of existing wetland is unacceptable to us. New habitat should be developed. Surely the financial gain to PGE for this conversion of forest-agricultural land to high density, heavy industrial use can justify the purchase and development of private land suitable for conversion to wetland and cottonwood habitats. This approach to mitigation should also be included in the Final E.I.S.

In closing, I simply have to state my extreme disappointment that West Hayden Island was included in Portland's urban growth boundary and re-zoned from agricultural use to industrial use. In my mind, Portland General Electric Company stockholders are foregoing a golden opportunity to make a major contribution to the citizens of Portland by donating this land to the City to be protected in perpetuity as a wildlife preserve for the education and enjoyment of future generations. I urge that this option be seriously considered as part of the no-build discussion.

With all the miles of developed and undeveloped industrially zoned river frontage along the Willamette and Columbia Rivers, both in Oregon and Washington, I find it hard to believe that there is a real need now or in the future for the completion of this project with its attendant high development costs, dredging, filling, bridge building and destruction of a major natural resource asset.

Sincerely yours,

John W. Broome
President

JWB:mje
0284H
cc: Dave Fredrickson, PGE
City of Portland Parks Department
Mayor Bud Clark

Section 1.0 describes the purpose and need of the proposed marine industrial development.

1000 FRIENDS OF OREGON

November 22, 1985

Distrist Engineer
U.S. Army Engineers District, Portland
Attn: NPPPL-NR
P.O. Box 2946
Portland, OR 97208-2946

RE: DEIS, West Hayden Island MarineIndustrial Park, Portland, Oregon, 1985. PGE Permit Application No. 071-OPA-2-005254

To the District Engineers:

1000 Friends of Oregon has reviewed the Draft EIS and would like to submit the following comments for the record. Our organization participated in the local planning process in 1982 during which Multnomah County redesignated the western portion of the island from "Natural Resource, Multiple Use Forestry" to "Urban". We supported this redesignation and the decision of the Metropolitan Service District in April, 1983 to include the western portion of the island within the regional urban growth boundary. The purpose of the plan map redesignation and UGB amendment was to provide additional land for marine-related industrial development in the Portland region.

While generally supporting the industrial use of West Hayden Island, we also communicated our concern to the County and Metro that the natural resource values of the island be evaluated and appropriately protected during the local planning process. This would involve application of statewide land use Goal 5 (Natural Resources) during any subsequent plan amendment proceedings (such as a zone change), and application of applicable county or city plan policies and ordinance provisions regulating development in or near fish and wildlife habitats and other inventoried Goal 5 resource sites.

Our major objection to the Draft EIS is its cursory review of land use regulations affecting the proposed project. Multnomah County Ordinance 333 and 334 contained in the Draft EIS Appendix A-1 both state an obligation to address any long term environmental and recreational losses from urban use of

If a Corps of Engineers permit is issued, it would be conditional upon the applicant receiving all other appropriate federal, state, and local permits. The land use issues discussed would be addressed as part of the local review process.

300 WILLAMETTE BUILDING 534 S.W. THIRD AVENUE, PORTLAND, OREGON 97204 (503) 223-4396

West Hayden Island. This obligation is set forth in the findings and conclusions for the plan map redesignation and in the revised Western Haydon Island Growth Management Policies. Please see the attachment to this letter for a detailed review of the relevant portions of both ordinances.

Both ordinances refer to "the Community Planning process for West Hayden Island." Multnomah County has not initiated the Community Planning process for the island. Nor has the applicant for this project, PGE, received the necessary zoning approvals from the County for the project as proposed in the Draft EIS (conversation with Lorna Stickle, Multnomah County Planning Director, November 21, 1985). We believe the applicant's request for a dredge and fill permit is premature in that significant planning issues at the local level have yet to be addressed.

Some of these issues include:

- type and intensity of uses for West Hayden Island
- site planning and phasing development for the project area
- application of the Significant Environmental Concern zone provisions in the design review process
- necessary zoning permits and conditional use approvals

The prudent course of action for the Corps is to postpone a permit decision until the local planning issues have been resolved.

As noted in the Draft EIS, the City of Portland has plans to annex West Hayden Island and at that time will assume the local planning responsibilities. The City is currently undergoing a major update of its comprehensive plan to address fish and wildlife resources, wetlands, riparian areas, and other resources pursuant to Goal 5. This update process will have a direct bearing on West Hayden planning efforts and further supports a postponement of a final Corp permit decision.

The local planning process, as indicated in Multnomah County Growth Management Policy, will also address access roads to the island and a new roadway bridge over Oregon Slough. The alignment of the roadway bridge is related to the proposed realignment of Marine Drive. It is our understanding that one of the proposed routes for Marine Drive would adversely impact wetlands, West Delta Park, and a Great Blue Heron Rookery. As the community planning process will address these issues, we urge the Corps to allow these issues to be resolved at the local level before acting on the permit request.

Finally, our organization is very concerned over the portion of the Draft EIS dealing with mitigation alternatives (IV 20-21). There is no mitigation plan contained in the Draft EIS so we have no way of evaluating the available options or the specific merits of each. Mitigation proposals will involve the City of Portland and/or Multnomah County through either land aquisition, easement rights, or management responsibilities. These issues have yet to be addressed in the local planning process.

The discussion on mitigation has been improved in the FEIS (Section 4.4). A final, approved mitigation plan would be a condition of an issued permit. Mitigation for riparian habitat would be included.

The mitigation alternatives discussed in the Draft EIS address only the 67 acres of wetlands to be filled. There is no mention of the cottonwood/ash habitat of West Hayden Island to be destroyed and the need to mitigate for this damage. It is our understanding that the applicant has pledged to mitigate for the loss of cottonwood/ash habitat, and that the Habitat Evaluation Process of the USFWS has accounted for the cottonwood/ash habitat in the baseline habitat values. We believe the Draft EIS should acknowledge the need to mitigate for the cottonwood/ash habitat (p. i. xi, xii, III-9, IV 20-21).

In summary, the Draft EIS needs to address the requirements of the local land use regulations in more detail. Second, the Corps needs to postpone final action on the permit request to give local governments the opportunity to address the site-specific concerns raised in the permit application. Third, a detailed mitigation plan should be devised and agreed upon by all parties prior to final action by the Corps.

Please contact our organization if you have any questions about the points raised in this letter.

Sincerely,

Paul Ketcham
Land Use Planner

PK/mm
cc: PGE
Multnomah County
City of Portland

MULTNOMAH COUNTY OREGON

DIVISION OF PLANNING AND DEVELOPMENT
2115 S.E. MORRISON
PORTLAND, OREGON 97214
(503) 248-3047

DENNIS BUCHANAN
COUNTY EXECUTIVE

November 26, 1985

Mr. Ken Bierly
c/o Oregon Division of State Lands
1445 State Street
Salem, Oregon 97310

RE: R/F 4037 West Hayden Island

Dear Mr. Bierly:

We have reviewed the draft EIS for the fill on the west end of Hayden Island. We have no outright objections to the filling of this part of the Island since the County has already recognized the need for marine industrial land at this location. There is some concern, however, that the inclusion in the EIS of Master Plan Alternatives may imply some specific development proposal as having County approval before it in fact has any. As has already been noted in Mr. Paul Ketchum's letter of November 22, 1985, the County ordinances which adopted the urban designation for West Hayden Island anticipated that a community planning process would be conducted which will apply to "specific future land use planning and development proposals, issues, and decisions with respect to West Hayden Island" (Ordinance #334, Page 2). The policies adopted in Ordinance #334 are interim policies to serve in the development of a more detailed community plan. This future planning process will address the environmental features of the area. The process for determining the specific appropriate land uses and their location through site planning has not yet been conducted at the local level. It is, therefore, difficult to respond to the specifics of this EIS which includes some fairly specific site plans.,

I do not wish to imply by these remarks that it is inappropriate to grant a fill permit at this time. However, there are factors which have not been addressed through an anticipated community planning process (whether City or County). It may be appropriate for the State and Fedeal agencies to determine in advance what concerns and conditions necessary are for granting their permits. This is particularly true in relation to the flood plain and fisheries issues. I believe, however, that any fill approval should reflect that no local approvals have been granted for specific land uses or for a site plan. If filling were to proceed on the basis of site plans contained in the EIS prior to any local approvals for flood plain permits, zone changes, design review or Significant Environmental Concern reviews, then the resolution anticipated by the future community plan may be somewhat moot. It may be possible to address all of the Federal and State concerns and issue the permit contingent upon the completion of the necessary local processes. It may well be that the final site design approved at the local level will differ somewhat from the EIS, but if the permit is issued in such a manner that some flexibility exists or that it can be amended or modified, this should not be a problem.

If you have any questions, please call me at 248-3182.

Sincerely,

MULTNOMAH COUNTY DIVISION OF PLANNING AND DEVELOPMENT

Lorna Stickel, Planning Director

LS:sec/0473L

cc: Michael Harrison, City of Portland

Ron Marg,
Army Corps of Engineers,
Portland District,
Regulatory Branch
PO Box 2946, Portland, 97208

Dave Fredrikson,
Portland General Electric
121 SW Salmon Street, Porrtland, 97204

Paul Ketcheum, 1000 Friends
300 Willamette Building
534 SW Third Avenue, Portland, Oregon 97204

PSD006533

Concerns regarding compliance with local approval processes are addressed in Section 3.3.1.C. If a Corps permit is issued, it will be conditional upon the applicant obtaining all other appropriate federal, state, and local approvals. There would be some flexibility to modify the permit if necessary.

U.S. Department of Transportation
United States Coast Guard

Commander
Thirteenth Coast Guard District

915 Second Avenue
Seattle, WA 98174-1067
Staff Symbol: (dpl)
Phone: (206) 442-7523

16452

DEC 3 1985

Mr. David Kurkoski
U. S. Army Corps of Engineers
Portland District
P.O. Box 2946
Portland, OR 97208

Dear Mr. Kurkoski:

We have reviewed the West Hayden Island Marine Industrial Park DEIS and the Portland General Electric Company permit application 071-OYA-2-005254 of 27 September 1985. We offer the following comments as a consolidated Coast Guard response:

a. Issuance or denial of Corps of Engineers Section 10/404 permits are separate from approval or denial of a Coast Guard permit for a new highway bridge. Commitment of resources prior to obtaining all required permits, including a bridge permit, is entirely at the risk of Portland General Electric.

This is understood.

b. It appears that placement of fill may constitute a significant flood plain encroachment because of adverse effects on natural and beneficial flood plain values.

Floodplain impacts are discussed in Section 4.1.2. The project area proposed for filling is located entirely within the 100-year floodplain of the Columbia. The natural values of the floodplain would be eliminated in the filled area (Section 5.2.10). These natural values would be, at least partially, replaced by the proposed mitigation.

c. The new highway bridge must be built on an alignment that prevents interference with the operation of the nearby railroad bridge. As a result, the location of the highway bridge may adversely affect the remaining three acres of wetlands.

The proposed highway bridge would be designed to not interfere with the railroad bridge. Decreases in remaining wetland habitat values (for the three acres) are incorporated in the HEP impact analysis (Section 4.2.1.C).

d. Although dredging may not affect underground or underwater utilities near the railroad bridge, the proposed new highway crossing could require relocation of those utilities.

Underground utilities will be avoided or relocated.

e. The height of aerial power transmission lines across Oregon Slough may have to be raised to accommodate large vessels.

(The transmission lines are high enough to clear ship traffic.)

f. No specific wetland mitigation measures are proposed. It is difficult to evaluate efforts to reduce or eliminate adverse effects when no details are provided. If the impacts will occur in stages over a period of years, then it may be appropriate to approve each stage individually.

The discussion of mitigation has been improved in the FEIS. Mitigation measures for wetlands and other habitat types are discussed in Section 4.4.

DEC 3 1985

g. Although there is no apparent conflict with the proposed "Portland/Vancouver - 10" anchorage, the DEIS makes no mention of this consideration and does not provide specific geographic coordinates to allow confirmation. PGE should affirm that the proposed ship channel configuration accounts for the proposed anchorage.

The proposed anchorage and access channel were coordinated to ensure that they are compatible.

h. The proposed ship channel and turning basin should be marked to ensure the safety of deep draft transits through the area.

The applicant will comply with all U.S. Coast Guard regulations.

i. The U. S. Coast Guard Marine Safety Office Portland should be notified of the commencement and termination of dredging associated with this project.

If you have questions regarding these comments, please call Mr. Roald Bendixen, of my environmental staff, at (FTS) 399-7523.

Sincerely,

J. J. McCLELLAND, JR.
Commander, U. S. Coast Guard
District Planning Officer
By direction of the
District Commander

PSD006535

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
847 NE 19th AVENUE, SUITE 350
PORTLAND, OREGON 97232-2279
(503) 230-5400

December 4, 1985 F/NWR5
FILE:

Colonel Gary R. Lord
District Engineer, Portland District
Corps of Engineers
P.O. Box 2946
Portland, OR 97208-2946

Re: P.N. 071-OYA-2-005254, Portland General Electric Co. (9/27/85)

Dear Colonel Lord:

We have reviewed the subject public notice and related clarification notice of November 15 which specified that you are requesting comments only on the Draft Environmental Impact Statement (Draft EIS) entitled "West Hayden Island Marine Industrial Park." We understand that this public notice focuses only on Alternative D, and that there will be another opportunity to comment upon the applicant's proposed mitigation plan, which has not yet been submitted, and the preferred alternative before the Final EIS is prepared.

The proposed project, Alternative D, would substantially alter the aquatic habitat surrounding Hayden Island. Two million cubic yards (MCY) of material are proposed to be dredged on the Columbia River side of the island to create a channel 8600 feet long with a 2000-foot turning basin having a depth of -45 feet. Six and one-half MCY of material are proposed to be dredged on the Oregon Slough side to provide fill material, thereby creating a 64-acre basin having a depth of -45 feet. The eight and one-half MCY of material would be used as fill to eliminate 67 acres of wetland on the island to create additional upland for industrial development. This industrial development would require additional alteration of aquatic habitat by bulkheads, wharfs, dolphins, and piers of undetermined number and size, and possibly dredging, all of which would be pursued through future permits. In addition, a bridge is planned over Oregon Slough to connect the island with North Marine Drive.

The proposed development is identified in the Multnomah County Comprehensive Plan as an extension of the Rivergate Industrial District, with use limited to marine industrial development and supporting uses. Its use is thus planned as water-dependent and water-related. However, the project is speculative in nature in that there are no specific users designated at this time. Because of this it is difficult to assess the need for a project of this design and scope and to assess the availability of alternatives. It is also difficult to compare the public benefits, which are

PSD006536

Expanded discussions of alternatives (Section 2.0) and purpose and need (Section 1.0) have been included in the FEIS.

hypothetical, with public losses (in terms of habitat degradation and destruction) which are assured.

Wetland Fill on Hayden Island. This habitat is described as open wetland (41 acres) and wooded wetland (29 acres), comprising 2 percent of the total wetlands of similar character existing between RM 12 and RM 145. Most of the wetlands on the island are said to be ephemeral and seasonally flooded. If these waters overflow or otherwise drain into Oregon Slough or the Columbia River, they provide to the river detritus and dissolved organic material needed for primary and secondary production which in turn supports fish production. It would be difficult to quantify the importance of these wetlands to the aquatic food chain in this area. It is likely that the importance of these wetlands is much greater than reflected by expressing their acreage as a percent of all wetlands of this type which occur over 133 miles of river. Detritus often accumulates in sediment depressions having relatively low water velocity and promotes invertebrate population growth. Submerged areas proximal to or just down current from a source of detritus such as freshwater wetlands are likely to have greater invertebrate production than areas remote from sources of organic material. Destruction of wetland detrital sources can thus be expected to reduce food production for fish in adjacent waters.

The HEP study results indicate that these wetlands have a relatively low habitat value to wildlife, particularly the herbaceous wetlands (Section 3.2.1.C). Wooded wetlands connected to the Oregon Slough provide a minor nutrient and detritus source for aquatic benthic organisms.

Excavation of 64-Acre Basin off Oregon Slough. We have no objection to the excavation of uplands to generate fill material. The proposed action, however, includes excavating the shallow aquatic shoreline area all along the southeast section of the site to connect an upland excavation with the river. The entire shallow shoreline area adjacent to the proposed basin, approximately 1.8 miles long, would be destroyed and replaced with a deep (-45 feet) hole. Shallow waters are valuable feeding and rearing areas for young salmonids and other species of fish. Most of this habitat in the metropolitan area has been destroyed or degraded by dredging, filling, riprapping and pollution. For this reason we recommend that the basin be excavated no deeper than -20 feet and that the sides be gently sloped towards shore to provide shallow waters to replace those to be destroyed. A -20 foot depth would be adequate to meet the only water-dependent use for this site expressed in the document, namely barge access. Creation of barge slips along shore should await site-specific plans and justified need. If the basin is proposed as mitigation for destruction of Oregon Slough habitat, it should receive protection in perpetuity through some mechanism such as a conservation easement to ensure that it is not destroyed in subsequent phases of development.

Excavation of the basin would result in an estimated loss of 19 acres of shallow water habitat (Section 4.2.2). This represents less than 0.5 percent of shallow water habitat between the Willamette and Sandy rivers in the Columbia River. The Department of Interior letter dated November 20, 1985 indicates they believe juvenile salmonid use of the Oregon Slough is minimal.

Dredged Channel and Turning Basin, Columbia River. The shallow waters along the north shore of Hayden Island provide a migration route for juvenile salmonids and presumably a feeding area as well. These functions would be lost by dredging along the shore for longitudinal terminal berthing, as planned. We recommend that the proposed dredged access channel stay offshore and that berthing be

Dredging activities will affect only about 10 acres of shallow water habitat along the north shore (Table 4.2-III).

planned beside finger piers on piles instead of along bulkheads on shore. Probable berth design needs to be considered in a habitat mitigation proposal because of the likelihood of destroying productive shallow water habitat by berth development. We urge design of a mitigation project which would recreate comparable shallow water feeding and rearing areas and ensure that this project causes no net loss of the productive capacity of fisheries habitat of the Columbia River.

Sincerely yours,

Dale R. Evans
Division Chief

cc: Washington Dept. of Fisheries
Oregon Dept. of Fish and Wildlife
Division of State Lands
Fish and Wildlife Service, ES, Portland
Environmental Protection Agency
Portland General Electric Co.

If bulkhead construction is necessary, it would be limited to south shore locations to minimize adverse impacts to migrating juvenile salmonids (Section 4.2.2). Proposed mitigation measures (Section 4.4) for aquatic species and habitat are limited to minimizing impacts.

Division of State Lands

1445 STATE STREET. SALEM, OREGON 97310 PHONE 378-3805

OREGON STATE LAND BOARD

VICTOR ATIYEH
Governor

BARBARA ROBERTS
Secretary of State

BILL RUTHERFORD
State Treasurer

December 4, 1985

Colonel Gary R. Lord
District Engineer
Portland District
U.S. Army Corps of Engineers
P.O. Box 2946
Portland, OR 97208

Attn: NPPPL-NR-EQ

Dear Colonel Lord:

I am providing comments on the West Hayden Island Marine Industrial Park, Portland, Oregon Draft Environmental Impact Statement. These comments are provided for the purposes of completing the NEPA process and adequately defining the regulatory permit requirements. Procedural comments are provided in this letter and detailed technical comments on the draft EIS are provided in the attached memorandum. The detailed technical comments on the draft EIS should be addressed in the final EIS.

The State of Oregon sees the draft EIS as a necessary first step in the regulatory permit process; however, the draft raises questions that must be answered before state approvals are provided. Completion of a detailed analysis of transportation impacts is necessary to allow the Oregon Department of Transportation to evaluate potential effects on the state highway system. Mr. Edward L. Hardt, Metro Region Engineer (phone 653-3090) can provide the details necessary to complete such an analysis.

A recent computer analysis by the ODOT indicated the project as currently designed will work within the transportation system. The analysis will be updated at each phase of the development process (Appendix A).

A detailed cultural resources study must be conducted to allow evaluation of potential impacts to these resources. Mr. Lee Gilsen, State Historical Preservation Officer (phone: 378-5023) can provide advice on the nature of the study requirements.

The cultural resource study was completed, and the results are summarized in Sections 3.3.9, 4.3.9, and 5.2 of the FEIS.

Multnomah County Planning Department has stated that local approvals are required for a specific design as presented in the draft EIS. Ms. Lorna Stickler, Planning Director (phone: 248-3047) can explain the specific local approval requirements.

When the required local approvals have been received and the technical evaluations made, a state permit decision can be made. Until that time the state will not make a Removal-Fill permit decision.

A discussion of the Multnomah County planning process is included in Section 3.3.1.C. If a Corps permit is issued, it would be conditional upon the applicant receiving all appropriate state and local approvals for the project.

Thank you for your consideration of these comments in the draft EIS.

Sincerely,

Ed Zajonc
Director

STATE OF OREGON INTEROFFICE MEMO

TO: Portland District, Corps of Engineers DATE: December 5, 1985

FROM: Division of State Lands

SUBJECT: West Hayden Marine Industrial Park Draft Environmental Impact Statement

Introduction: This memorandum addresses technical issues raised in the draft EIS in the order they are presented in the draft document.

1.0 - Purpose and Need

1.1 - Applicant Purpose and Need - No Comments

1.2 - Public Purpose and Need - This statement could be enhanced by providing a factual discussion of the local economic importance of maritime trade, public benefits from maritime industry and a clear description of the nature of public benefits anticipated by local land use approvals.

A detailed discussion of the specific impacts of marine industrial development is contained in the FEIS, Sections 3.3.2 and 4.3.2. This section covers the number of jobs, monetary values, types of businesses, and number of firms in the local area which use port facilities.

1.3 - Supporting Information - The market data summarized in this section helps to define the applicant's need but appear to be based upon conclusory statements such as "Additional private land needs will be generated by public policies aimed at developing segments of the Willamette River greenway at the south edge of downtown Portland." and "this excess demand on the north side of the Columbia is more likely to accrue to lower Columbia River ports in Oregon . . .".

The concluding statements have been modified. The chart in Section 1.3.G separates the different types of need. The basic document identifying need is the Oregon Ports Study, which identifies a need for over 600 acres. This project would provide less than 500 acres of that demand.

2.0 - ALTERNATIVES

2.1 - General Description of the Proposed Action
This description adequately locates and defines the purpose of the project and describes the potential use of the site.

2.2 - Alternative Development Plans
This section delineates three alternative development scenarios, each of which proposes development of the entire island. No scenario is proposed that would involve development of the north shore only or other partial development options. These options would allow on site mitigation of habitat resource losses.

The discussion of alternatives has been improved in the FEIS to include three development alternatives, as well as a no action alternative. Alternatives B and C propose partial development of the site which would allow for on-site mitigation activities.

2.3 - Alternative Locations for the Proposed Development

The alternative sites other than the Vancouver appear to be clearly unsuitable.

2.4 - Alternative Land Uses for the West Hayden Island Site

Alternative land uses associated with recreational use may be allowable under the existing zoning and should be explored.

Under current property ownership, use of West Hayden Island for recreational purposes is not likely. The no action alternative is limited to a discussion of reasonably foreseeable alternative uses.

2.5 - No Action

This appears to be the same as the discussion in 2.4.

The discussion on the no action alternative has been improved in the FEIS.

2.6 - Comparison of Alternatives

The discussion of alternatives focuses on "the development plan which best meets the applicant's objective..." With that as the primary criteria, the practicality of other alternatives cannot be determined. For example, dismission of Alternatives A, B and C because they are not "considered feasible by the applicant" does not allow a determination to be made of the comparative public resource impacts of these alternatives. This portion of the EIS would be considerably enhanced by 1) a full evaluation of all alternative designs including a partial build alternative and 2) a full evaluation of the Vancouver site alternative.

Comparison of development alternatives has been improved in the FEIS. The Port of Vancouver plans to use their property to meet their own development needs.

3.0 - Affected Environment

3.1 - Physical Environment

The description of the physical environment appears to be sufficient and accurate. The only additional data that would add to the draft EIS would be specific data on sediment chemical quality.

Sediments in the Columbia River are primarily fine- to medium-grain sand which are continually cleaned by river currents. Because sand has a low affinity for accumulating contaminants, concentrations sufficient to cause adverse impacts are not expected. Oregon Slough sediments are expected to contain finer material. All sediments will be contained in upland disposal areas. No quantitative chemical analysis of sediments adjacent to West Hayden Island was conducted.

3.2 - Biological Environment

The description of the biological resources appears to be sufficient and accurate. The comparisons of wetland acreages to those along a 133 mile reach of the Lower Columbia gives little perspective on wetland resources of the Columbia/Lower Willamette system. A historical analysis of the wetland and riparian resources in the immediate vicinity over the last century would provide a better perspective for understanding the proposed 70 acre wetland loss. The description of benthic organisms could be enhanced by exploring the apparent close and direct relationship between benthic population size and detritus in the sediments (greater than 1000/m difference). This relationship compared with the proposed dredging, bulkhead construction and filling should give a good basis for impact evaluation.

Comparison of habitat, including wetlands, on West Hayden Island to similar habitat in the region was reduced to an area between RM 79 and RM 145 in the FEIS and an area along the Columbia River from the mouth of the Willamette River to the mouth of the Sandy River (Section 3.2.1). Relative wildlife habitat values are also discussed in Section 3.2.1.C. The relationship of substrate composition and benthic densities is mentioned in Section 3.2.3.B.

3.3 Social and Economic Setting

This description only mentions briefly the highway bridge access issue that must be resolved before the fill can be placed and utilized as proposed. The proposed transportation modifications must be integrated with plans and priorities of the Oregon Department of Transportation and Multnomah County. A detailed analysis will be needed to identify the specific traffic impacts and required highway construction mitigation measures.

A more detailed description of the bridge is contained in Section 2.1.2. ODOT has indicated the proposed project as currently designed would work within the transportation system. This would be reanalyzed at each phase of the development process. Any modifications would be coordinated with ODOT and Multnomah County.

The discussion of land use refers to an appendix; however, no mention is made of the required land use approvals for a specific development proposal. The timing of local approvals for a specific development plan must be discussed in relation to the state and federal permits applied for.

The land use section has been modified and the other approvals have been listed. If a Corps permit is issued, it would be conditional upon the applicant receiving all other state and local permits or approvals.

4.0 - Environmental Effects of Alternatives

4.1 - Physical Environment

There is no discussion of maintenance dredging requirements either as an estimate of annual volumes or an estimate of area required for disposal. Water quality effects of maintenance dredging including sediment quality should be discussed.

Maintenance dredging requirements are included in Sections 2.1.2.D and 4.2.2 of the FEIS.

4.2 - Biological Environment

The discussion of dredging effects on benthic populations provides a standard for impact evaluation. The discussion of wetlands focuses on off-site mitigation. To reasonably evaluate the impacts, a specific mitigation proposal should be made. The wetlands impact section should be expanded to provide some evaluation of the comparative loss of 70 acres of wetland with historical losses and remaining areas of wetland and ripartan habitats in the immediate area.

Both on- and off-site mitigation measures for the proposed marine development are discussed in Section 4.4. A detailed mitigation plan cannot be developed until a specific development alternative has been selected. An approved mitigation plan would be a condition of the fill permit and include compensation for both wetland and riparian habitats. Mitigation for aquatic habitats and species would be in the form of minimizing impacts.

4.3 - Social and Economic Impacts

This section needs to be enhanced by detailed proposals of transportation impacts. Discussions with the Metro Region Engineer, Department of Transportation could be helpful in defining the necessary information and analysis.

A recent computer analysis by the ODOT indicated the project as currently designed would work within the transportation system. The analysis would be updated at each phase of the development process (Appendix A).

There is no specific design proposed for the access bridge. The bridge design should consider potential impacts to navigation (both recreational and commercial) as well as impacts to traffic patterns and resources on the island.

Specific details regarding the bridge would be addressed during a separate approval process with the U.S. Coast Guard. Bridge permit application would be subject to fill permit approval.

No adjustment can be made of the effects of the proposal on cultural resources without a cultural resource survey.

A cultural resources survey has been completed and is referenced in Sections 3.3.9 and 4.3.9.

4.4 - Mitigation Alternatives

This discussion would be made more relevant by addition of a specific mitigation proposal. An analysis of the regional value of the Hayden Island site for wetland/riparian habitat would provide a basis for determining impacts to this resource.

There are also a wide variety of mitigating measures that would reduce or ameliorate impacts that should be discussed. Examples include:

a) piling supported structures rather than bulkheads with fill along the waterfront
b) phased development, protecting wetlands until the north shore is developed.
c) specific measures to minimize traffic impacts.
d) measures to be taken to minimize maintenance dredging impacts
e) measures to be taken to minimize recreational boating conflicts
f) measures to be taken to minimize noise impacts
g) measures to be taken to minimize cultural resource impacts.

KB/tb
0426f

The mitigation section of the FEIS has been expanded to include on-site and off-site mitigation program proposals. A detailed mitigation plan cannot be developed until a specific site development alternative has been selected. The plan will be subject to agency approval and an approved plan a condition of the fill permit. Habitat compensation will be based on the results of the habitat evaluation study conducted in 1985 (Sections 3.2.1.C and 4.2.1.C). Various mitigation measures to minimize impacts will also be adopted (Section 4.4).