Coastal Zone Management Program

TONGUE POINT
HIGHEST AND BEST USE STUDY

Astoria, Oregon

Williams-Kuebelbeck and Associates, Inc.

TONGUE POINT
HIGHEST AND BEST USE STUDY

Prepared for
STATE OF OREGON
DIVISION OF STATE LANDS

October 1981

Prepared by

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Financial assistance for this report was provided, in part, by the Coastal Zone Management Act of 1972, as amended, administered by the Federal Office of Coastal Zone Management, National Oceanic and Atmospheric Administration (NOAA).

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I. INTRODUCTION

A. BACKGROUND AND PURPOSE

In June 1981, the state of Oregon, through its Division of State Lands and Department of Energy, retained Williams-Kuebelbeck and Associates (WK&A) to evaluate the highest and best use of two adjacent parcels at Tongue Point near Astoria, Oregon. The parcels comprise approximately 155 acres of uplands and 275 acres of aquatic area which provide the site with water access to the mouth of the Columbia River.

The primary purpose of this highest and best use study is to determine the most feasible use(s) of the Tongue Point parcels and thereby assist the Division of State Lands and the Land Board in formulating a strategy for the use of the property. In addition to evaluating the market potential for alternative uses, the study includes analyses of the physical, land use planning, environmental, and regulatory opportunities and constraints which influence the use of the parcels.

B. FORMAT OF THE REPORT

This report presents the results of the highest and best use study. It is organized into six chapters. Following this introduction and summary of findings and conclusions, Chapter II describes the site and its physical characteristics. Chapter III is devoted to a presentation of land use planning issues and institutional opportunities and constraints related to the development of the site. An analysis of the market demand for industrial development is presented in Chapter IV.

Based upon the findings from the assessments of (a) physical conditions, (b) land use planning and institutional issues, and (c) market demand, alternative development scenarios were identified. They are described in Chapter V and evaluated in Chapter VI. Conclusions regarding the feasibility of each alternative are also presented in Chapter VI.

C. SUMMARY OF CONCLUSIONS

A total of seven alternative development scenarios were identified for the Tongue Point parcels including three scenarios for the north parcel (labeled N1, N2 and N3) and four scenarios for the south parcel (S1 through S4). Each is described below:

Scenario N1 - One hundred acre coal export facility with an annual throughput capability of 10 million short tons and potential for expansion to 150 acres or 15 million short tons.

Scenario N2 - A three berth terminal incorporating one break bulk or container facility for forest products, one shoreside log loading terminal, and one mini-bridge container facility.

Scenario N3 - A marine terminal providing up to three berths for handling dry bulk commodities other than coal (e.g. grains and minerals).

Scenario S1 - A barge/rail transshipment facility that would receive grain and/or other bulk commodities for conveyance to ocean-going vessels at the north parcel.

Scenario S2 - An overflow facility that would provide backup acreage for the storage of cargoes moving through the north site.

Scenario S3 - An industrial park type of development incorporating light industrial, warehousing and office uses. This is a nonwater-dependent alternative.

Scenario S4 - A shoreside log storage operation similar to the current use of the north parcel.

Four major categories of criteria were used to evaluate the alternative scenarios for each parcel: economic considerations, site suitability, land use and institutional implications, and environmental impact. Financial feasibility was not included as a criterion; it is the subject of a separate evaluation being prepared for the Division of State Lands.

A summary of the conclusions of this highest and best use study follows.

North Parcel

Scenario N2 (three berth terminal) is the most attractive of the three alternatives considered for the north parcel. Its uses are supported by the strongest near- and mid-term demand, it has the potential to generate the largest number of permanent direct jobs (420-480), it does not depend upon deepening the Columbia River bar and channel, and its environmental impacts would be no more significant than the other scenarios. The mixed use nature of N2's three berths and its employment generating potential also suggest that N2 would stimulate greater economic "spillover" benefits than either N1 or N3. On the basis of institutional and land use implications, there are no significant differences among the three scenarios.

Scenarios N2's mini-bridge container facility would require upgrading of the Burlington Northern Railroad between Portland and Tongue Point. However, this same improvement is also a requirement for Scenario N1's coal facility and Scenario N3's Midwest grain component.

Factors serving to impair the feasibility of Scenario N2 include the presence of single carrier rather than competitive rail service and uncertainties regarding (a) future changes in federal log export policies and (b) future trends in Pacific Northwest forest production.

Scenarios N1 and N3 are both supported by market demand considerations. However, a coal terminal (N1) would be at a disadvantage vis-a-vis other potential Pacific Northwest ports due to rail distance and channel depth. To overcome this disadvantage, the Columbia River bar and channel would require deepening to handle vessels of 100,000 DWT, thereby reducing the transportation cost per ton to a level comparable with other prospective coal ports. The maximum turning basin depth of 25 feet, specified in the mediation agreement, impairs the site's suitability for a coal terminal. Finally, this scenario would generate far fewer jobs than Scenario N2 (approximately 100 compared to 420-480 for N2) and would be more costly ($93.3 million for N1 versus $54.9 million for N2[1/]).

[1/] Costs exclude railroad upgrading.

Scenario N3 would also require deepening of the river channel in order to make the site competitive vis-a-vis Portland for the export of Midwest grains. As with Scenario N1, the 25 foot turning basin poses a problem for this scenario. The very strong demand anticipated for the grain exports (6-7 new berths in the Lower Columbia Region by the year 2000) bodes well for this scenario if the site's physical limitations (i.e. channel depth and rail conditions) can be removed. Development costs ($48.9 million) are the lowest of the three scenarios.

In light of Scenario N3's advantages, consideration should be given to a "hybrid" scenario that incorporates a grain facility into the three berth terminal concept of Scenario N2.

South Parcel

Among the four major categories of evaluation criteria (economic considerations, site suitability, land use and institutional implications, and environmental impact), economic considerations are most decisive in determining the feasibility of the alternative scenarios. The market analysis revealed it is not likely that the south parcel will be required for a barge/rail transshipment facility (Scenario S1) because of the north site's ability to receive barges and unit trains and to provide sufficient backup land. The latter point (adequate backup land) is also the reason why an overflow facility (Scenario S2) is unlikely to be demanded. An exception would be to utilize the south parcel for the storage of different grades of coal and/or for a blending operation as an extension of a very large coal export facility on the north parcel. In terms of timing, the need for such a use on the south parcel would arise only after full utilization of the north site's 150 acres, estimated to occur not before 1995.

The demand for general industrial land, as envisioned in Scenario S3, was found to be relatively weak in the Clatsop County market area. In the absence of sufficient market demand, this scenario cannot be justified from an economic perspective. However, other criteria suggest the desirability of general industrial development on the south parcel. It

can provide diversification, it has a relatively high employment density (jobs per acre), it does not require waterway alterations and, as a result, its impact on the aquatic environment would be minimal.

The fourth and last alternative considered for the south parcel, S4 - Shoreside Log Storage, appears to be the most feasible, at least in the near term. It represents a use similar to the current activity at the north parcel. It requires relatively few alterations to the land and water area. However, it is also a very low intensity use, creates relatively few jobs, and would not generate very large rental revenues.

In light of the foregoing findings and conclusions, it is apparent that none of the four south parcel scenarios presents itself as a clear "best use." Scenario S4 could be a suitable interim use until such time as the south parcel is demanded either for general industrial development or to meet the expansion needs of a coal terminal on the north parcel. If Scenario N2 (three berth terminal) is implemented on the north parcel, then only Scenarios S3 or S4 would be feasible to consider on the south parcel.

A decision regarding the acquisition of the south parcel by the Division of State Lands (DSL) should be based upon a comprehensive evaluation of optional courses of action. One option presently under consideration by DSL is to trade land currently owned by the state for the south parcel. Such a trade may be beneficial to the state (i.e. the state could acquire a site with some revenue generating potential in exchange for one with no such potential). However, only a detailed evaluation will determine the level of financial feasibility and provide assurance that all options favorable to the state have been considered.

II. SITE CONDITIONS

A. SETTING

Located just east of the city of Astoria, the site extends from the base of the promontory known as Tongue Point to the mouth of the John Day River and contains approximately 155 acres of uplands and more than 275 acres of related aquatic property. It is bounded on the south and west by U.S. Highway 30 and intersected by the Burlington Northern Railroad line (see Figure 1).

For planning purposes, the site has been divided into a northern and a southern parcel. The former, containing 55 acres of uplands and 94 acres of aquatic area, is the site of an abandoned naval station. Remaining improvements include 35 acres of tarmac, several airplane hangers and associated buildings, and five concrete finger piers on steel pilings. Title to this northern parcel recently was transferred from the federal government to the Oregon Division of State Lands (DSL) which temporarily leases it to the Dant and Russell Company for log storage.

The southern parcel is owned by the U.S. General Services Administration (GSA). DSL has an option to purchase 100 acres of uplands and 180 acres of associated aquatic property. This area is substantially undeveloped with the exception of a small Army Corps of Engineers' field station and wooden T-head pier with adjacent timber pile dolphins.

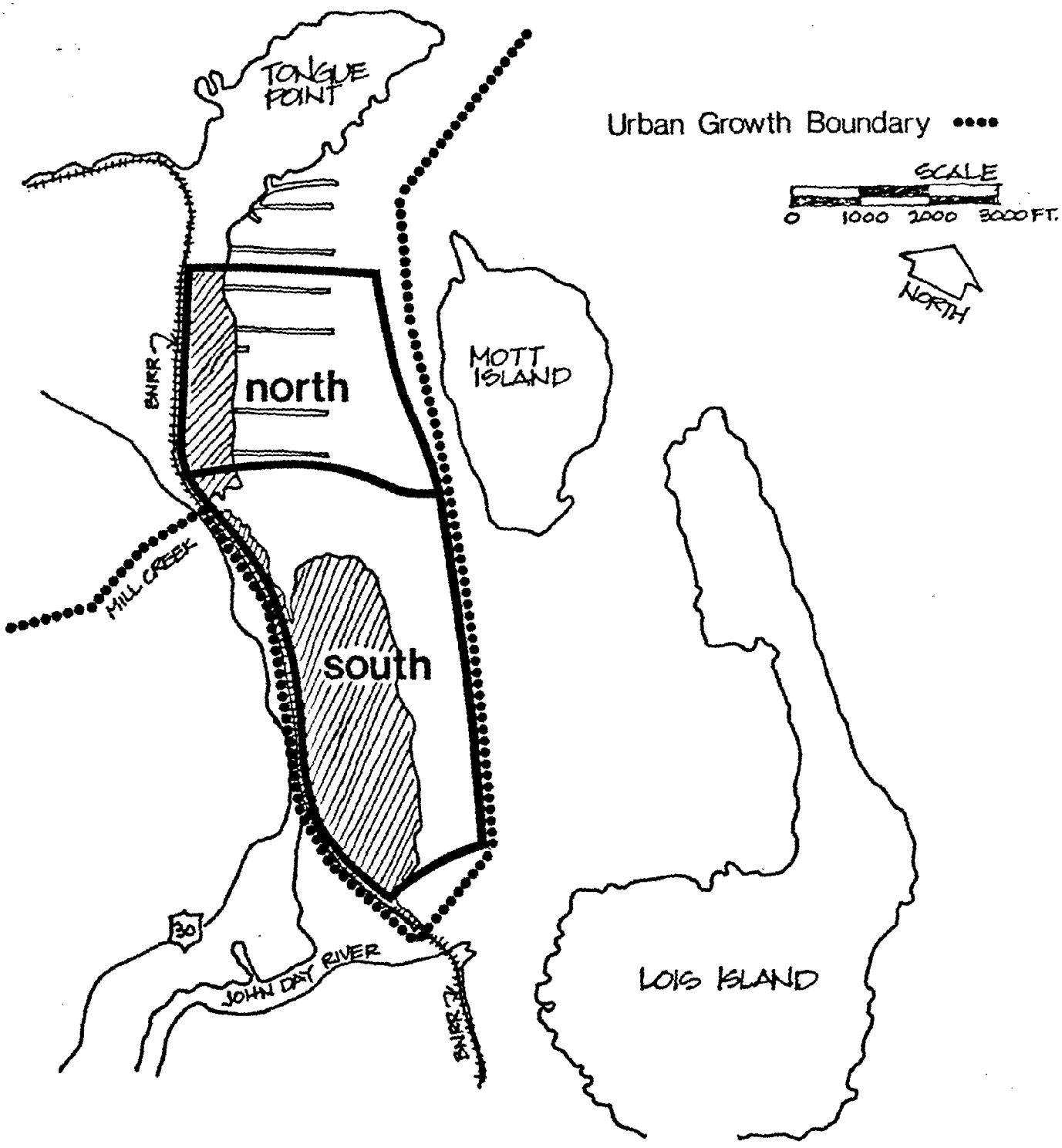
B. PHYSICAL CHARACTERISTICS

Access

Highway access to both parcels is from U.S. 30 by short connecting roads. The roads are in good condition, although they do not appear to have been designed for heavy truck use. Grades, in part, are quite steep.

FIGURE 1

Tongue Point and Environs



Rail access to the site is provided by the single track Burlington Northern line, connecting Portland to Astoria, which runs immediately adjacent to the site. This line, adequate for present freight traffic, would require substantial upgrading for use by unit trains (e.g. for coal or grain movement). Burlington Northern estimates the cost of upgrading at $30 to $35 million. The railroad tracks run generally between Highway 30 and riverfront towns. As a result, there are numerous grade crossings at Scapoose, St. Helens and Clatskanie. In Rainier the tracks run down the middle of a commerical city street.

Ship access to the north parcel would be from the Columbia River channel about 1.4 miles distant. Approximately 1.7 million cubic yards of sand and silt would have to be dredged to create an entrance channel and ship berths 42 feet deep and a turning basin 25 feet deep.[1/] The present finger piers are unsuitable for cargo movement and water depth between the piers averages only 12 feet.[1/] To make the area usable as a port facility, the finger piers should be removed and the area filled to the elevation of the present uplands. Spoils from channel dredging could be used for this fill.

The south parcel is also accessible by water. However, the policies of the recently approved, CREST sponsored, mediation agreement allow for an access channel of only 25 feet depth. Under such conditions, the site would be accessible to ocean-going barges but not to deep draft ships. It should be noted that the present water depth of 18 feet is adequate for barge traffic.

Soils

North Parcel - Borings taken before construction of the former Navy base do not reveal any major impediments to dredging of the channel to -42 feet, or -50 feet should this be required in the future. Soils to be dredged are mostly silts and sand. Only off the northwest corner of the property does a lens of sandstone show up about 6 feet deep, from elevation -20 to -26, more or less, which could cause some problems to a suction dredge.

[1/] Swan Wooster Engineering Inc.

Condition of the pavement on the uplands seems to indicate that, once consolidated, fill soil can be very firm. It is recognized, however, that in that area bedrock is not far below the surface. In the new fill areas dewatering and consolidation of dredge fill may be required. The existing piers and piling should be removed prior to filling to insure uniform settling.

South Parcel - No soils borings are available for this parcel. From visual inspection it appears that the upper soils layers are soft and silty. The water table is high. To make the area usable it appears that, after stripping of the vegetation, some granular fill may have to be imported.

Utilities

Water - Potable water is furnished to the north parcel by the city of Astoria. The site contains an extensive water distribution system including fire lines on the finger piers. Water use of most port facilities is fairly modest. However, a coal terminal requires about 25 gallons of water per ton of coal moved, mostly for sprinkling (dust control) purposes. A 15 million ton per year terminal would require 350 million gallons of water. This would strain the city's water supply, according to Mr. Kuske, City Engineer of Astoria. Columbia River water may have to be used for sprinkling.

Water to the south parcel is furnished by the John Day Water District which in turn buys its water from the city of Astoria. At present the city does not allow sale of its water by other water districts for new industrial uses.

Power - Power is supplied by Pacific Power and Light Company. The moderate requirements of a port facility could readily be accommodated.

Sanitary Sewer - At present sewage from Tongue Point is pumped to the city of Astoria treatment lagoon. The work force on a port facility would impose only a modest increase in sewage flow on the system. Other industrial uses would have to be evaluated separately. The City Engineer of Astoria noted excessive infiltration into Tongue Point collector lines. These lines may have to be replaced before additional loads can be accommodated.

III. LAND USE PLANNING ISSUES AND INSTITUTIONAL OPPORTUNITIES AND CONSTRAINTS

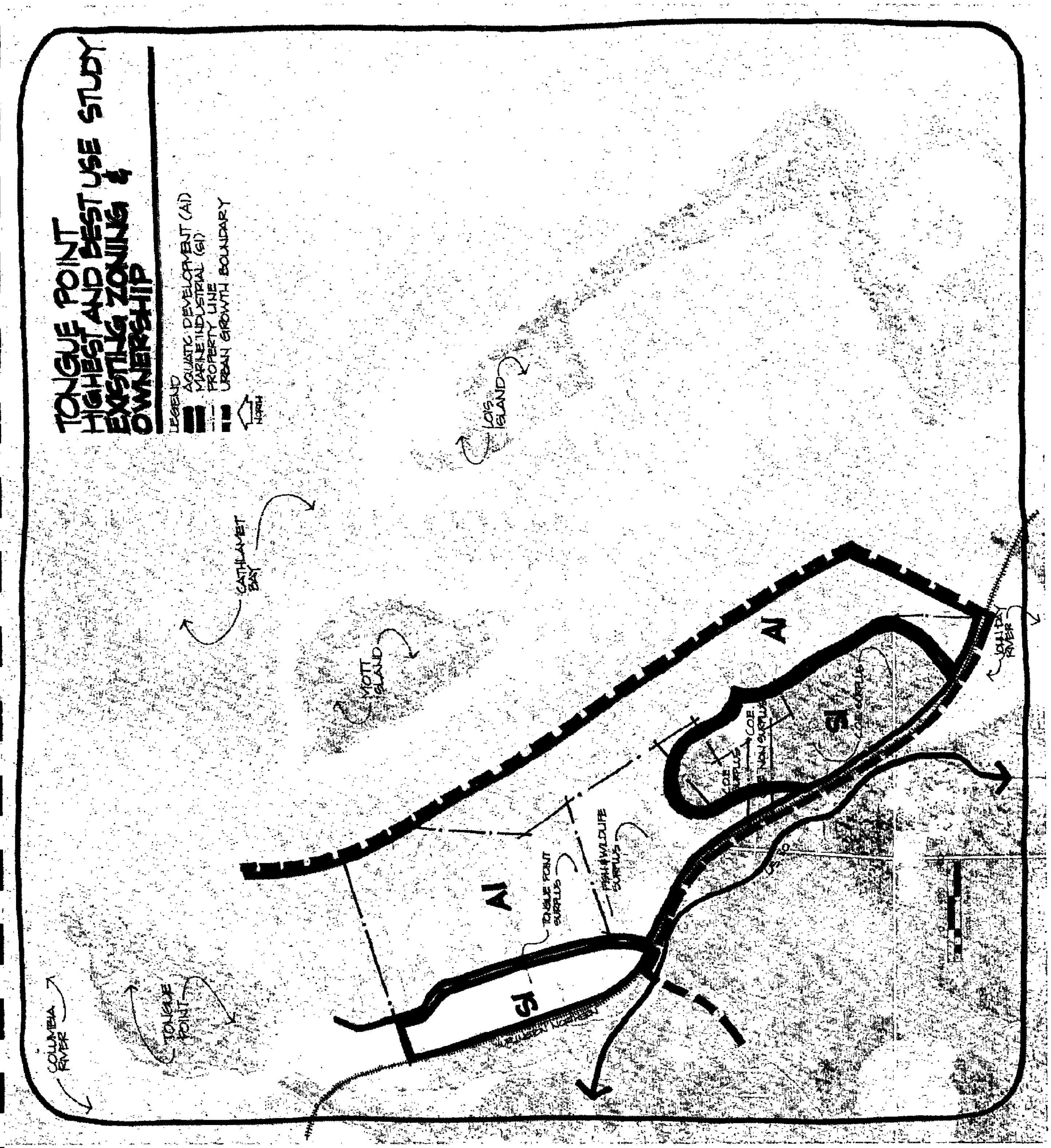
A. BACKGROUND

According to The Lower Columbia River Ports Region Study,[1/] Tongue Point is one of only six sites in the lower 50 miles of the Columbia River which is suited for deep draft marine-related development. Its advantages include proximity to the mouth of the river and its main channel, existing port facilities, considerable amount of undeveloped land, rail and highway access, and protection from high winds, ship wakes, and waves. Moreover, its location east of Astoria would have a minimal adverse impact on rail and truck traffic in the city. On the negative side, development of the full site would require filling of productive tidal marshes and mudflats, result in the loss of productive fish habitat, and adversely affect a nearby wildlife refuge and recreational fishing opportunities. Proper development requires balancing natural resource values and economic advantages.

Although Tongue Point is not in the city limits of Astoria, it is within the urban growth boundary and, therefore, subject to the city's comprehensive plan. In the current plan, the entire site is designated for water-dependent development with corresponding zoning designations of S-1, Marine Industrial Shorelands, and A-1, Aquatic Development (see Figure 2). However, findings of the State Land Conservation and Development Commission (LCDC) indicated that there are inadequate findings in the plan to support approval of exceptions to state land use goal 16, Estuarine Resources. This is necessary to permit intense development of the southern portion. For this and other reasons, LCDC temporarily has withheld its acknowledgement or approval of the plan.

[1/] Oregon Department of Transportation, 1975.

FIGURE 2


TONGUE POINT
HIGHEST AND BEST USE STUDY
EXISTING ZONING &
OWNERSHIP
LEGEND
AQUATIC DEVELOPMENT (AI)
MARINE INDUSTRIAL (SI)
PROPERTY LINE
URBAN GROWTH BOUNDARY
NORTH
CATHLAMET BAY
LOIS ISLAND
MOTT ISLAND
TONGUE POINT
COLUMBIA RIVER
JOHN DAY RIVER
AI
AI
SI
SI
TONGUE POINT SURPLUS
FISH & WILDLIFE SURPLUS
COE SURPLUS

To address the development/environmental conflict at Tongue Point and other potential industrial sites on the Lower Columbia, 12 local, state, and federal agencies under the auspices of the Columbia River Estuary Study Taskforce (CREST) negotiated the parameters of development at these sites. Their work culminated in approval and signing of a mediation agreement in June 1981. According to the agreement, north Tongue Point will be permitted to develop as a deep draft port facility suitable for the export of commodities in containers or bulk, such as coal, grain, or forest products. Two sets of land use designations were established for development of the south portion: either as a shallow draft marine facility or for general industrial purposes not requiring waterborne transportation or access. These designations will be incorporated into the revised Astoria comprehensive plan which will be resubmitted to DLCD no later than December 1981.

B. FACTORS INFLUENCING OPTIMUM DEVELOPMENT

Agencies and Organizations

Table 1 summarizes the roles and responsibilities of the public and private agencies and organizations which affect ultimate utilization of Tongue Point.

Public Plans and Policies

General Land Use Planning - Due to its inclusion in Astoria's urban growth boundary, development at Tongue Point is governed by the city comprehensive plan. All local comprehensive plans in Oregon must address at least 14 statewide planning goals established and monitored by the Land Conservation and Development Commission (LCDC). In addition, because its urban growth boundary extends into the estuary of the Columbia River, Astoria also must consider goal 16, Estuarine Resources. According to the goal, "Dredge, fill, or other reduction or degredation of these natural values by man shall be allowed only:

Table 1

PUBLIC AND PRIVATE AGENCIES AND ORGANIZATIONS
AFFECTING ULTIMATE UTILIZATION OF TONGUE POINT

Agency/Organization	Role	Functions
Local		
City of Astoria	- Decision maker - Service provider - Land use regulator	- Determines acceptable land uses through comprehensive plan and zone code; - Reviews proposed land uses for compliance with comprehensive plan; - Issues necessary local permits, if site annexed prior to development; - Provides urban services including water, sewer, police, and fire protection.
Clatsop County	- Governing body - Land use regulator	- Reviews proposed land uses for compliance with comprehensive plan; - Issues necessary local permits, subject to review by city, if site not annexed prior to development.
Port of Astoria	- Marketer - Potential Decision maker	- Acts as marketing agent for site on behalf of owner; - Under provisions of SB 777, may negotiate purchase or lease of property.
Columbia River Estuary Study Taskforce (CREST)	- Planning/Research	- Conducts research on environmental and economic impacts of lower Columbia River development; - Develops findings for proposed land uses on site for inclusion in City of Astoria comprehensive plan.
Clatsop-Tillamook Intergovernmental Council (CTIC)	- Planning/Research	- Prepares regional economic forecasts; - Formulates economic development goals and policies; - Prepares city of Astoria comprehensive plan under contract.
State		
Division of State Lands (DSL)	- Owner - Regulator	- Owns northern portion of site and has option to purchase southern portion; all revenues from development activities allocated to state common school fund; - Issues waterways project permit pursuant to state fill and removal law (ORS 541); - Coordinates state review of federal dredging and fill permit applications.
Land Conservation and Development Commission (LCDC)	Regulator	- Reviews "Certificate of Consistency" to Oregon Coastal Management Program (OCMP) required for federal permits; - Reviews state and federal dredge and fill applications, in absence of acknowledged local comprehensive plan; - Approves exceptions to state land use goals; - Reviews and acknowledges local comprehensive plans.

Continued.....

Table 1 (Continued)

Agency/Organization	Role	Functions
State (continued)		
Oregon Department of Environmental Quality (DEQ)	- Regulatory - Funding Provider	- Issues water and air discharge permits; - Provides funds for public sewers; - Issues tax credits for pollution control.
Oregon Department of Fish and Wildlife (ODFW)	- Regulator	- Reviews federal permit applications pursuant to federal Fish and Wildlife Coordination Act.
Oregon Department of Economic Development (DED)	- Advisor - Marketer	- Assists CREST in developing economic development element of the latter's comprehensive plan; - Reviews local comprehensive plans for compliance with state land use goal 9; - Provides assistance to state & local entities through revenue bonds & contacts with industrial clients.
Federal		
General Services Administration (GSA)	- Owner	- Owns southern portion of site.
Army Corps of Engineers (Corps)	- Regulator - Maintainer of river channel	- Issues Section 404 permit for discharge of dredge or fill materials in U.S. waters, pursuant to Clean Water Act of 1972; - Issues Section 10 permit for excavation or location of structures in U.S. navigable waters, pursuant to Rivers and Harbors Act of 1899; - Prepare EIS prior to issuance of federal permits, pursuant to National Environmental Policy Act (NEPA) of 1969; - Maintains river channel depths authorized by Congress.
Environmental Protection Agency (EPA)	- Regulator - Funding provider	- Reviews federal dredge and fill permit applications for impacts on water quality; - Develops guidelines for discharge/ disposal of dredged or fill materials; - Provides funds for construction of public sewer systems.
U.S. Fish and Wildlife Service (FWS)	- Operator - Regulator	- Operates Lewis and Clark Wildlife Refuge in vicinity of site; - Reviews federal dredge and fill permit applications pursuant to Fish and Wildlife Coordination Act.
National Marine Fisheries Service (NMFS)	- Regulator	- Reviews federal dredge and fill permit applications pursuant to Fish and Wildlife Coordination Act.
Congress	- Policy maker - Funding provider	- Approves and appropriates funds for Columbia River channel improvements.
Job Corps	- User	- Operates training facility north of site.
Others		
Burlington Northern Railroad	- Owner - Operator	- Owns & maintains track between Portland and Astoria; - Operates trains serving Astoria.
1,000 Friends of Oregon	- Public Interest	- Monitors major local land use decisions for compliance with state land use goals and guidelines.
Oregon Environmental Council	- Public Interest	- Monitors environmental impacts of proposed land uses.

Source: Cogan & Associates

(1) If required for navigation or other water-dependent uses that require an estuarine location; and
(2) If public need is demonstrated; and
(3) If no alternative upland locations exist; and
(4) If adverse impacts are minimized as much as feasible."

Based on findings demonstrating the above and in accordance with the recommendations of the mediation agreement, LCDC can grant exceptions to goal 16. Full industrial development of Tongue Point could not take place without such approval.

Until Tongue Point is annexed to the city, it is under the control of Clatsop County. To minimize potential land use conflicts, the county and city have closely coordinated their planning activities. They have been assisted by CREST, a federally and locally funded regional research and planning agency which coordinates development activities in the lower Columbia River estuary. In its regional plan, CREST has identified and evaluated potential deep-draft marine industrial sites and assessed potential environmental and economic impacts, developed findings to justify exceptions to goal 16, and established standards for dredging, filling, and other alterations associated with this type of development to meet goal requirements.

Much of this information has been incorporated into the city's comprehensive plan. The Clatsop-Tillamook Intergovernmental Council, CTIC, another regional planning entity, has evaluated current economic conditions in the estuary and formulated development goals and policies. This work forms the basis for the city plan's economic element and provides additional justification for the approval of exceptions to goal 16 for Tongue Point.

Guiding Policy Documents - The specific plans and policies which will guide land use decisions at Tongue Point are described here.

City of Astoria Comprehensive Plan: In the initial draft of its comprehensive plan, adopted in June 1979, the city of Astoria designated Tongue

Point for Water-Dependent Development with corresponding zoning designations of S-1, Marine Industrial Shorelands, and A-1, Aquatic Development. According to the plan, water-dependent refers to "uses and activities which can only be carried out on, in or adjacent to water; the water location or access must be needed for either waterborne transportation, recreation, or a source of water."

Although marine industry and supporting uses is the "highest priority," other water-dependent commercial and recreational uses are permitted in an S-1 zone subject to public review based on established criteria. Residential uses, log storage facilities, solid waste disposal, and utilities are conditionally permitted. The A-1 zone is a complementary designation for water areas adjacent to marine-related land development, and permits the same conditional and administratively reviewed uses. In addition, activities associated with marine development such as bank line alterations, dike construction, dredged material disposal, excavation, fill, and shoreline stabilization associated with marine development are permitted in both zones, providing standards in the zone code are fulfilled. These include demonstrations of public need, evaluation of alternative sites, and minimization or mitigation of adverse impacts.

In its review of the plan, the Land Conservation and Development Commission found inadequate findings to justify exceptions to goal 16. Subsequently, the city has participated in a CREST-sponsored mediation process with other interested public agencies to develop findings and determine the appropriate uses of this and other potential industrial sites. In the resulting mediation agreement, existing plan and zone designations for the north parcel were retained, while mutually exclusive alternative designations were selected for the southern parcel. These will be incorporated into the revised Astoria comprehensive plan. When a specific development proposal is approved for the southern portion of Tongue Point, the plan will be amended to confirm this land use designation.

Clatsop County Comprehensive Plan: As noted above, until Tongue Point is annexed by the city, technically it remains under the jurisdiction of Clatsop County. In June 1979, the county adopted the city's comprehensive plan and zoning designations for the site in accordance with its agreement to eliminate potential land use conflicts. The county also will revise its comprehensive plan to reflect changes resulting from the recent CREST mediation agreement. If annexation to the city does not occur prior to development, the county will review specific proposals and issue the appropriate permits, subject to city review and comment. Any potential conflicts between city and county policy can be resolved by the directors of the respective planning departments or through joint hearings of the city and county planning commissions.

Mediation Agreement: As noted, a CREST-sponsored mediation process was initiated in mid-1980 and an agreement signed in June 1981 to resolve general environmental/developmental conflicts related to the development of several potential Lower Columbia River marine industrial sites including Tongue Point. Twelve federal, state, and local agencies are signatories to the agreement. This is a significant step in facilitating LCDC acknowledgement of Astoria's comprehensive plan and improves the predictability of the required federal and state permit process for marine-related industrial development. With regard to Tongue Point, the agreement:

- Identifies development designations;
- Indicates needed improvements, including those requiring exception to goal 16;
- Presents preliminary findings of fact.

Under its provision, north Tongue Point may be developed as a deep water port facility for the shipment of container or bulk goods including grain, coal, or forest products (see Figures 3 and 4). This conforms to the designations in the city's comprehensive plan. Alternatives have been suggested for the southern portion of Tongue Point. If it is developed as

FIGURE 3

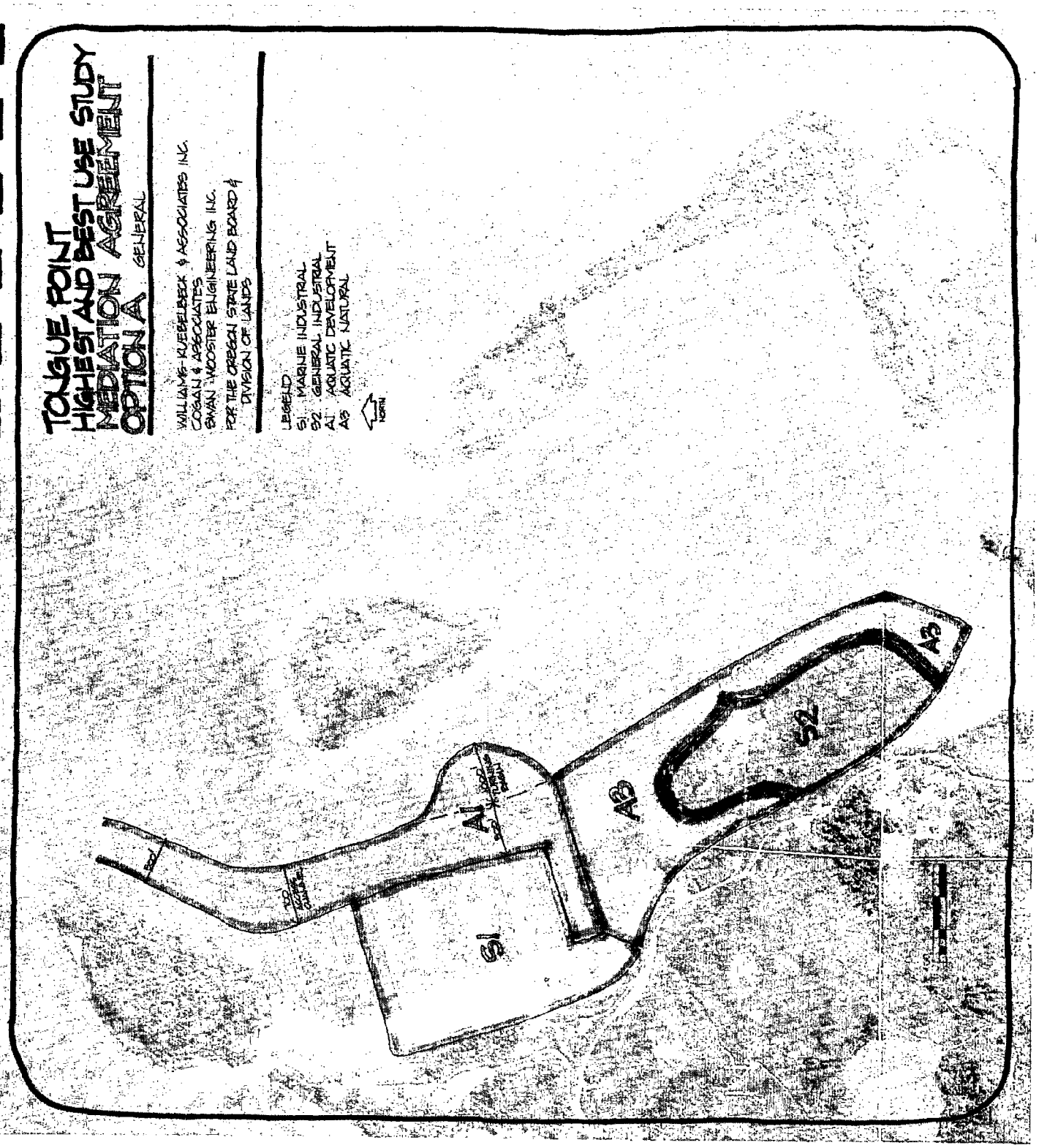

TONGUE POINT
HIGHEST AND BEST USE STUDY
MEDIATION AGREEMENT
OPTION A GENERAL
WILLAMS-KUEBELBECK & ASSOCIATES INC.
COGAN & ASSOCIATES
SWAN WOOSTER ENGINEERING INC.
FOR THE OREGON STATE LAND BOARD &
DIVISION OF LANDS
LEGEND
S1 MARINE INDUSTRIAL
S2 GENERAL INDUSTRIAL
A1 AQUATIC DEVELOPMENT
A3 AQUATIC NATURAL
NORTH
S1
S2
S3
A1
A2
A3

FIGURE 4

TONGUE POINT
HIGHEST AND BEST USE STUDY
MEDIATION AGREEMENT
OPTION B WATER - DEPENDENT
WILLIAMS - KUEBELBECK & ASSOCIATES INC.
COGAN & ASSOCIATES
SWAN - WOOSTER ENGINEERING INC.
FOR THE OREGON STATE LAND BOARD & DIVISION OF LANDS
LEGEND
S1 MARINE INDUSTRIAL
A1 AQUATIC DEVELOPMENT
A2 AQUATIC CONSERVATION
A3 AQUATIC NATURAL
North
S1
A1
A2
A3
Scale in Feet

a general industrial site for uses not requiring waterborne transportation, the uplands would be zoned S-2, General Shorelands Development, and surrounding water A-3, Aquatic Natural (Option A, Figure 3).

Another option is for the southern portion to be developed as a shallow draft port facility for the shipment of bulk or containerized goods by ocean-going barge (Option B, Figure 4). Five exceptions to goal 16 must be approved to facilitate the construction of these facilities, including an access corridor between the north and south portions; docks; and a spur from the main railroad line. LCDC's participation in the mediation process greatly enhances the probability of state approval of such exceptions.

After development of formal findings by CREST, the city will incorporate the provisions of the agreement into its comprehensive plan. While it resolves some important environmental/developmental conflicts associated with utilization of Tongue Point, the mediation agreement does not replace the federal and state agency permit process.

C. OPPORTUNITIES AND CONSTRAINTS TO DEVELOPMENT

Based on the foregoing background information and interviews with 15 representatives of state and local agencies and public interest groups (see Appendix A), the following opportunities and constraints to the development of the Tongue Point site have been identified.

Opportunities

Political

1. All the local entities in the economically depressed Astoria area, including the city, county, port, CREST, and CTIC, generally support development activities to generate employment and encourage private investment. Tongue Point is identified by these agencies as one of the most likely sites for development.

2. Economic revitalization of Clatsop County and improvement of the state's position in maritime trade are important priorities of Governor Vic Atiyeh. To this end, he established the Lower Columbia River Development Task Force which has studied the feasibility of locating a coal export facility in the Astoria area.

3. Senator Mark Hatfield and Representative Les AuCoin publicly support the principle of assisting the economic recovery of Clatsop County. The senator has been an active proponent of improvements to the Columbia River channel which will enhance the competitive position of all ports on the river.

Institutional

1. As noted, DSL owns a portion of Tongue Point. However, because it has no marketing capability, it has designated the Port of Astoria to perform that function for Tongue Point. Because the port owns other property in which it has a more direct interest, it cannot be expected to give its undivided attention to Tongue Point. Some more positive factors in the DSL/Port of Astoria relationship are indicated by the following:

   - Improvements to the main channel and Burlington Northern Railroad will enhance the marketability of the entire area, including the port's property;
   - Any development in the Astoria area can be expected to have impact on further private investment;
   - One of the port's responsibilities as a public entity is to encourage the creation of jobs anywhere within its district. This includes Tongue Point.

3. With the passage of Senate Bill 777 by the 1981 session of the Oregon Legislature, DSL is required to initiate negotiations with the port regarding possible lease or sale of the property to the port. Because of the port's development, marketing, and maintenance expertise and its revenue bonding authority, it's a potentially valuable development partner. However, there are many legal, institutional, and financial obstacles to the successful outcome of such negotiations.

4. The recent mediation agreement facilitates timely decisions regarding development of Tongue Point by:

   - Deflecting or eliminating potential environmental opposition to the industrial development on environmental grounds by the concerned local, state, and federal agencies who signed the agreement;

   - Formulating preliminary findings. If backed by adequate documentation, these are likely to justify LCDC's approval of exceptions to statewide goal 16 which are necessary for approval of marine industrial development of the southern portion;

   - Adopting dual land use designations for the southern portion which permit some development flexibility;

   - Facilitating the federal and state permit process and thus providing potential developers with a degree of predictability.

5. Although ultimate utilization of the site depends on the actions of a large number of institutions, the mediation process has provided an orderly means of resolving potential conflicts.

6. The federal and state permit process is reasonably orderly and no more complex or time consuming than for other projects of similar size and intensity.

Planning

1. Tongue Point is only one of six sites on the Oregon side of the Lower Columbia suitable for deep draft port development. In location and physical characteristics, Tongue Point compares favorable with the others.

2. A good working relationship among several local entities including the city, county, CREST, and CTIC, has resulted in a well coordinated regional comprehensive planning effort.

3. The comprehensive plan of the city of Astoria and the CREST-sponsored mediation agreement define the parameters of development for Tongue Point, including types and intensities of uses which will be permitted and the standards and criteria by which specific development proposals will be evaluated.

Environmental

1. The mediation process has set the stage for orderly resolution of of major developmental/environmental issues in regards to Tongue Point. There is no organized environmental opposition to development at this time.

2. Intense development of the northern portion of Tongue Point will not cause a significant loss of estuarine resources.

3. As an alternative to marine industrial development in the southern portion, the mediation agreement permits non-water dependent industrial development. This would have minimal impact upon surrounding aquatic areas.

4. Due to the location of Tongue Point east of Astoria, the impacts on the city of additional rail and truck traffic will be minimal. In this respect, Tongue Point is more advantageous than sites further downstream.

Constraints

Political

1. Continued competition for public and private investment between Astoria and other Lower Columbia River ports including Longview, Kalama, St. Helens, and Portland, can be expected.

2. Astoria also competes with Oregon ocean ports such as Coos Bay as well as major port facilities in California and Washington.

Institutional

1. The Division of State Lands, DSL, owns the northern Tongue Point site, but has neither industrial development, marketing, nor maintenance expertise. It also does not have authority to issue revenue bonds.

2. DSL has a possible conflict of interest with regard to ownership/development and regulatory roles. A primary goal of the agency, as the owner of Tongue Point and other properties, is to earn maximum profits for the state's common school fund. The agency also is responsible for issuing dredging permits and otherwise protecting the state's interest in public waterways.

Planning

1. The land use planning process has resulted in a necessarily general comprehensive plan. A specific development proposal must be identified before more detailed site planning can occur.

2. One of the more difficult planning tasks is to coordinate public and private investments. These include extending and upgrading of the Burlington Northern railroad line, obtaining funds for improvements to the main channel, if required, and extending public services from the city of Astoria.

3. Full utilization of the southern portion as a port facility may not be possible if the 25-foot access channel is retained.

Environmental

1. Development of Tongue Point for coal or other bulk cargo will necessitate frequent rail traffic consisting of many cars. This will have an adverse impact upon the upstream Oregon communities of Clatskanie, Scappoose, Rainier, and St. Helens.

2. The EIS, environmental impact statement, required by the Corps of Engineers before approval of filling and dredge permits may identify conflicts between development and estuarine protection not heretofore noted.

3. The industrial development of north Tongue Point may be incompatible with the adjacent federal Job Corps Center.

4. The exact nature and extent of mitigation actions that will be required by the various agencies is uncertain; this may add undetermined time and cost to a proposed project.

D. FINDINGS AND CONCLUSIONS

1. Tongue Point is only one of six sites suitable for deep draft port development on the lower 50 miles of the Columbia River. This factor, coupled with deteriorating economic conditions in the Astoria area, supports industrial development of the site, despite the possible loss or deterioration of estuarine resources.

2. The political climate is favorable to development of Tongue Point. Officials from the economically depressed Clatsop County area view this as a means of generating new jobs and providing a magnet for further private investment. State and federal officials also favor economic revitalization of the county and an increase in Oregon's maritime trade.

3. The range of uses permitted at the site are defined in several key public documents, including the city of Astoria comprehensive plan and zoning code and the CREST-sponsored mediation agreement. They allow development of north Tongue Point as a deep draft port facility for the shipment of containers or bulk goods including grain, coal, or forest products. In the south portion, development either as a shallow draft port for shipment of goods carried by ocean-going barge or as a non-water dependent general industrial area, is allowed. The former requires approval by the LCDC of exceptions to state land use goal 16.

4. The maximum 25-foot channel specified in the mediation agreement for the southern portion somewhat limits industrial activities and may affect full utilization of this site.

5. Preliminary planning activities necessary to facilitate development are nearly completed:

   a. Local agencies, including the city, county, CREST, and CTIC have developed a well coordinated comprehensive planning process.

   b. The recently negotiated mediation agreement:

      (1) Provides a forum for the appropriate local, state, and federal agencies to discuss the ultimate development of the area;

      (2) Develops preliminary findings that improve chances of LCDC approval of exceptions to goal 16 necessary for the marine industrial development of the southern portion;

      (3) Adopts two land use designations on the southern portion, permitting some development flexibility.

(4) Facilitates the federal and state permit process and provides developers a degree of predictability.

c. The city of Astoria has made substantial progress in revising its comprehensive plan and tentatively is scheduled to resubmit it to LCDC by the end of 1981. The acknowledged plan is a key to timely development.

6. While preliminary planning for development of Tongue Point is well along, further substantive progress depends upon receipt of a specific development proposal.

7. DSL, the Division of State Lands, has retained the Port of Astoria as a marketing agent. Although the port has no proprietary interest in Tongue Point at this time, it does have a stake in its utilization, because any development in the Astoria area can be expected to be an impetus for further private investment. Improvements to the main river channel and the railroad associated with development at Tongue Point will enhance the attractiveness of the port's own sites. Furthermore, recent state legislation requires DSL to negotiate with the port for the sale or lease of the Tongue Point property. While many legal, institutional, and financial barriers must be overcome before an agreement can be consummated, the port, with its expertise and revenue bonding authority, can be a valuable development partner.

8. After a development proposal is selected, it will be necessary to coordinate public and private investments. These include extending services from the city of Astoria and upgrading the Burlington Northern Railroad line. Improvements to the channel require congressional approval.

9. Although the federal and state permit process is complex, it is no more demanding than the requirements for any other major development

of similar size and intensity. Nevertheless, it may take several years before the necessary permits are issued and site preparation, including dredging and filling, is completed.

IV. MARKET ANALYSIS

A. APPROACH

This chapter analyzes the market potential for industrial development at Tongue Point. It consists of a brief overview of economic conditions in Clatsop County, followed by evaluations of the markets within the county for several types of industrial land. The market evaluations specifically entail:

1. Defining competitive market areas which would be served by various water-and nonwater-related industrial uses. In most cases within this report the market areas are defined by the Lower Columbia River region, extending from Portland to Astoria.

2. Forecasting market demand for industrial facilities using (a) recent economic trends; and (b) cargo forecasts.

3. Surveying the potential supply of industrial land and classifying this land in terms of suitability for different types of industrial development.

4. Evaluating the locational advantages and disadvantages of the Tongue Point sites for industrial development vis-a-vis competitive locations within the market area.

5. Summarizing development opportunities at Tongue Point in terms of land requirements for industrial uses, by type.

B. OVERVIEW OF THE CLATSOP COUNTY ECONOMY

Clatsop County is situated at the northwest corner of Oregon, bounded by the Columbia River to the north and the Pacific Ocean to the west. Being both remote - approximately two hours driving time from the more urbanized Willamette Valley - and typified by rugged, forested terrain, the county is relatively undeveloped with an economy centered around natural resources. These characteristics have led to a slow rate of growth. Between 1972 and 1980 total employment rose at an average rate of 1.63 percent per year (Table 2). Population grew at a slightly lower rate, averaging 1.33 percent per year between 1970 and 1980 (Table 3).

Because of its geographic situation the Clatsop County economy is based on forestry, seafood processing, tourism, and cargo movements through the Port of Astoria. According to data collected by the Clatsop-Tillamook Intergovernmental Council, the annual direct and indirect dollar impact of each of these sectors on the county's economy is:[1/]

- Forest Products $168 million (derived in 1978)
- Seafood Processing $133 million (derived in 1978)
- Tourism $ 55 million (derived in 1978)
- Cargo Movement $ 5 million (derived in 1976)

Although these estimates are dated and have changed over the last several years, they provide a useful approximation of the magnitude of economic impact generated by each sector. Clearly, the forest products and seafood industries are the most important in Clatsop County. This point is further verified by Table 4, which shows that in 1980 the lumber and wood products sector and food products sector, combined, comprised 17 percent of total county employment - more than 64 percent of manufacturing employment.

[1/] Rainmar Bartl and Mike Morgan, An Economic Evaluation of the Columbia River Estuary, Columbia River Estuary Study Team, February 1981, pp. 8, 10, 12, and 14.

Table 2

EMPLOYMENT PATTERNS IN CLATSOP COUNTY

1972 to 1980

	1972	1973	1974	1975	1976	1977	1978	1979	1980	Annual Compound Percent Change 1972-1980
TOTAL WAGE AND SALARY EMPLOYMENT	9,870	10,240	10,480	10,190	10,510	11,470	11,740	12,010	11,230	1.63%
MANUFACTURING, TOTAL EMPLOYMENT	3,270	3,260	3,460	3,040	3,130	3,410	3,320	3,550	2,990	(-1.11%)
Durable Goods	1,070	1,150	1,160	1,040	1,100	1,130	1,130	1,170	1,050	(-0.24%)
Lumber and Wood Products	950	1,020	1,020	910	960	990	980	1,000	910	(-0.54%)
Other Durable Goods	120	130	140	130	140	140	150	170	140	1.95%
Nondurable Goods	2,200	2,110	2,300	2,000	2,030	2,280	2,190	2,380	1,940	(-1.56%)
Food Products	1,480	1,340	1,500	1,170	1,370	1,410	1,400	1,470	1,000	(-4.54%)
Other Nondurable Goods	750	770	800	830	660	870	790	910	940	2.86%
NONMANUFACTURING, TOTAL EMPLOYMENT	6,600	6,980	7,020	7,150	7,380	8.060	8,420	8,460	8,240	2.81%
Contract Construction	310	350	290	310	310	370	410	470	410	3.50%
Transportation, Communications, Utilities	600	640	650	650	630	620	650	640	600	0.00%
Trade (Wholesale and Retail)	1,930	2,000	2,010	2,040	2,160	2,440	2,610	2,580	2,510	3.34%
Finance, Insurance, Real Estate	260	300	300	320	350	410	450	440	440	6.80%
Services and Miscellaneous	1,440	1,520	1,560	1,580	1,710	1,780	1,920	2,020	2,000	4.19%
Government	2,060	2,170	2,210	2,250	2,220	2,440	2,380	2,310	2,280	1.28%

Source: Department of Human Resources, State of Oregon Employment Division; Williams-Kuebelbeck and Associates, Inc.

Table 3
CHANGE IN POPULATION
CLATSOP COUNTY
1970-1980

	1970	1980	Annual Compound Percent Change
Clatsop County Total	28,473	32,484	1.33
. Astoria	10,244	9,998	-0.24
. Warrenton	1,825	2,493	3.17
. Hammond	500	516	0.32
. Gearhart	829	967	1.55
. Seaside	4,402	5,193	1.67
. Cannon Beach	779	1,187	4.30

Source: 1980 Census of Population; Advance Reports, March 1981.

Table 4

DISTRIBUTION OF EMPLOYEES BY SECTOR

CLATSOP COUNTY

1972 and 1980

	1972	Percent of 1972 Total	1980	Percent of 1980 Total
Manufacturing, Total	3,270	33.1%	2,990	26.6%
Durable Goods	1,070	10.8%	1,050	9.3%
Lumber and Wood	950	9.6%	910	8.1%
Other Durable Goods	120	1.2%	140	1.2%
Nondurable Goods	2,200	22.3%	1,940	17.3%
Food Products	1,450	14.7%	1,000	8.9%
Other Nondurable Goods	750	7.6%	940	8.4%
Nonmanufacturing, Total	6,600	66.9%	8,240	73.4%
Contract Construction	310	3.1%	410	3.7%
Transportation, Communications, Utilities	600	6.1%	600	5.3%
Trade (Retail and Wholesale)	1,930	19.6%	2,510	22.4%
Finance, Insurance, Real Estate	260	2.6%	440	3.9%
Services and Miscellaneous	1,440	14.6%	2,000	17.8%
Government	2,060	20.9%	2,280	20.3%
Total Wage and Salary Employment	9,870	100.0%	11,230	100.0%

Source: Department of Human Resources, State of Oregon Employment Division, Williams-Kuebelbeck and Associates, Inc.

Table 4 also illustrates an interesting problem: Clatsop County is undergoing a fundamental shift in employment away from manufacturing sectors to non-manufacturing sectors. In 1972, 33.1 percent of the employed work force was involved in some form of manufacturing. By 1980 this percentage had dropped to 26.6 percent. Conversely, the significance of non-manufacturing employment has increased, rising from 66.9 percent of total employment in 1972 to 73.4 percent of the total in 1980. Most importantly, the lumber and wood sector and food products sector have both experienced absolute and relative declines in employment; the only two sectors to do so during the period 1972-1980. As will be explained below, the two most important sectors of the local economy - forest products and seafood processing - are undergoing a recession. The economic impact of this decline has only been ameliorated through the growth in employment experienced in the wholesale and retail trade sector and the services and miscellaneous sector, primarily due to the increasing importance of the county's tourism industry.

The following sections present an in-depth discussion of each of the Clatsop County's major economic sectors.

Forest Products

The Northwest forest products industry is undergoing one of its worst slumps in three decades, resulting from (a) a drop in demand due to the recession-caused decline in housing construction; (b) increases in the price of Northwest timber (particularly federally-owned timber on national forest land) relative to timber harvested in the South; and (c) a decreasing supply of harvestable timber in the Pacific Northwest.[1/] The prospects for recovery are as yet unclear. While housing starts, and thus demand for lumber, should increase once interest rates begin to fall, the increasing importance of both Canada and the southern United States as inexpensive sources of wood products could severely limit any potential expansion of the Northwest forest products industry.

[1/] "It's Recession-Plus in the Forest," Business Week, June 2, 1980, p. 98.

Despite these limitations, Clatsop County is probably one of the best situated counties in Oregon in regard to timber supply. According to one study, published by Oregon State University, the North Coast timbershed (which includes Clatsop County) could experience an annual harvest of as much as 401.7 million cubic feet of timber by the period 1995-2005; a 33.4 percent increase over the 1968-1973 average annual harvest of 301.1 million cubic feet of timber.[1/] No other timbershed in Oregon has as great a potential. By comparison, some timbersheds, such as the mid-Willamette Valley, Roseburg, and Eugene, are expected to experience decreases in production.

The economic impact this expanded supply of timber will have on Clatsop County is dependent upon two factors: the extent to which the supply is harvested (a function of future market demand), and the location of timber processing facilities. In regard to the latter point, much of the growth in timber supply will occur in an area known as the "Tillamook Burn", which should be harvestable by the end of this century. Both Dant and Russell and the Crown Zellerbach Company have vacant land reserved near Wauna for future plant expansion in order to take advantage of the potential yields from the Tillamook Burn. The bulk of Tillamook Burn, however, is located south of Clatsop County, and while some of the harvest will be transported north to processing plants along the Columbia River, much of it could also go the facilities along the coast or in the Willamette Valley.[2/]

Seafood Industry

The economic vitality of seafood products industries is dependent upon a number of complex, almost unpredictable variables such as the market prices of fish products, domestic and overseas demand, the location and quantity of harvestable species, and harvesting/processing technology. In general, the Clatsop County fishing industry has been depressed over

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[1/] Beuter, et al, Timber for Oregon's Tomorrow, Oregon State University, 1976.

[2/] Personal communication, Mike Morgan, Clatsop-Tillamook Intergovernmental Council, August 1981.

the last several years, due primarily to (a) the migration of some species, such as albacore tuna, to areas other than off the Oregon coast; (b) a reduction of the salmon resource and thus a decrease in exports of frozen salmon and salmon roe to Japan; and (c) lack of adequate processing facilities for bottomfish.[1/]

This latter point, the difficulty in processing bottomfish, is a very important constraint on the future expansion of the Clatsop County fishing industry. Fishermen in the Pacific Northwest have traditionally harvested high-value species such as crab, shrimp, and salmon. These latter two species have, in terms of value, been Clatsop County's most important fisheries (along with tuna, scallops, black cod, dungeness crab, and bottomfish).[2/] High-value seafood, however, is usually difficult and expensive to harvest, thus resulting in relatively low volume yields. Furthermore, these high-value fish are generally being caught at their maximum sustainable rate of harvest, leaving little room for increased yields.[3/] Bottomfish consequently constitute most of the potential for fisheries expansion having received a large boost from the establishment of the 200 mile fishing limit.

Species of bottomfish most easily harvested by ships operating from Clatsop County are, in order of quantity available, pacific whiting (hake) and rockfish. Unlike high-value fish such as salmon, bottomfish are usually processed into fillets for use by fast food chains, supermarket

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[1/] Based on (a) personal communication, Jim Bergeron, Clatsop County Marine Extension Agent, August 1981; and (b) CH2M Hill, Impacts of the Extended 200-Mile Fishery Limit, Vol. II of the 1980 Port System Study for the Public Ports of Washington State, Washington Public Ports Association, July 1980.

[2/] Personal communication, Jim Bergeron, Clatsop County Marine Extension Agent, August 1981.

[3/] CH2M Hill, Op. Cit., p. 6-1.

chains, and some institutional groups. To prevent the rapid onset of decay, hake requires processing and freezing within several hours after being caught; this fishery must thus rely primarily upon shipboard processing facilities. At present, the Pacific Northwest bottomfish fleet lacks vessels capable of rapidly handling/processing large tonnages of fish, and is consequently unable to exploit the hake population off the Pacific Coast.[1/]

Tourism

An expanding tourist industry in Clatsop County has helped to soften the impact of the recent downturns in the area's forestry and fishing industries. The economic benefits brought by tourists are best shown by the increase in both the trade and services sectors over the last ten years, growing by 3.3 percent per year and 4.2 percent per year, respectively (refer to Table 2). The Clatsop-Tillamook Intergovernmental Council (CTIC) estimates the largest percent of tourist dollars spent in Clatsop County probably occurred in areas fronting the Pacific Ocean, rather than in the estuarine portions along the Columbia River[3/] (as Table 2 showed earlier, this hypothesis is at least partially validated by the population growth experienced at Cannon Beach, Seaside and Gearhart relative to Astoria's population loss). The CTIC likewise estimates that within the estuary the marina/sports fishing industry creates the largest impact.[3/] Several studies have projected a need for additional recreational moorage facilities along the Columbia River estuary.[4/]

[1/] Ibid.

[2/] Bartl and Morgan, Op. Cit., p. 14.

[3/] Ibid.

[4/] Columbia River Estuary Marina Study, Columbia River Estuary Study Team, March 1978; Commercial and Recreational Boating Facilities in Oregon Estuaries, Department of Land Conservation and Development, June 1979.

Cargo Movements

The Port of Astoria is the only public port in Clatsop County, operating three piers along the Columbia River. As indicated by Table 5, cargo moved through the port is based heavily on the local resource base, with log exports dominating total movements (in 1980 log exports composed almost 100 percent of the port's total cargo movements). As a result, the recent decline in tonnage handled by the port reflects the economic slump Clatsop County is currently suffering. Over the last ten years total cargo movements have declined by almost a third, at a rate averaging nearly 3.8 percent per year. The range of goods moved through the port has also dropped dramatically; by 1980 only four types of cargo were exported from Astoria, compared with twelve types in 1970. Imports, always a small proportion of total tonnage moved through Astoria (3.2 percent in 1970), fell to only 0.5 percent of total tonnage in 1980.

Aside from the current economic recession, other factors contributing to the Port of Astoria's loss of cargo are (a) competition from facilities upstream, notably the Port of Longview and the Port of Kalama, due to their superior location in regard to population centers and transportation networks; and (b) out-moded port facilities - specifically the grain elevator which has a capacity of 1.1 million bushels. The future of the Port of Astoria is not necessarily grim, however. Its position near the mouth of the Columbia River gives the port the potential to become an important deep-water facility if rail access to Astoria can be improved and if both the mouth of the river and the channel up to Astoria are deepened to allow the passage of bulk carriers larger in size than those currently serving ports upriver. These two constraints, particularly in regard to how they affect the potential use of Tongue Point, will be discussed further in a later section of this report.

Table 5

PORT OF ASTORIA

CARGO MOVEMENTS

1970 to 1980

(Thousands of Tons)

OUTBOUND OCEAN TONNAGE	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Annual Compound Percentage Change 1970-1980
Logs	959.0	869.1	1,165.6	654.2	785.8	1,171.3	1,191.1	1,072.4	1,068.0	1,207.5	996.3	
Lumber	76.7	78.9	99.5	108.0	99.0	65.5	66.6	45.3	14.3	8.3	2.7	
Plywood	3.8	0.1	0.6	0.4	0.7	--	0.1	--	--	--	--	
Flour and Rolled Oats	6.5	21.7	25.5	--	--	--	1.7	--	--	--	--	
Grain Products	323.5	240.8	314.7	494.2	347.6	201.0	323.2	226.0	22.3	--	--	
Bulk Peas	2.7	11.0	12.2	5.8	--	--	--	--	--	--	--	
Feed Pellets	17.5	0.2	6.4	3.2	--	--	--	--	--	--	--	
Wood Pulp	6.8	3.3	--	--	--	--	0.2	--	--	--	--	
Paper Products	5.7	12.5	2.5	6.1	2.3	1.8	2.5	1.5	--	--	--	
General Cargo	4.0	0.8	--	0.8	0.3	--	--	0.2	--	0.2	0.5	
Urea	17.7	--	--	--	--	--	--	--	--	--	--	
Containers	--	--	--	--	--	--	--	--	--	--	0.1	
Total Outbound	1,423.9	1,247.4	1,627.0	1,272.7	1,235.7	1,439.6	1,585.4	1,345.4	1,104.6	1,216.0	999.6	(-3.48%)
INBOUND OCEAN TONNAGE												
Petroleum	19.0	11.5	12.9	--	--	--	--	--	--	--	--	
Frozen Fish	3.3	3.8	5.4	7.1	5.7	5.4	4.1	2.2	1.3	0.4	--	
Wood Pulp	11.6	13.7	24.5	28.1	33.6	3.1	11.2	--	--	--	--	
General Cargo	1.5	0.4	--	0.3	--	0.1	--	0.1	--	0.2	--	
Canned Fish	5.8	--	--	--	--	--	--	--	--	--	--	
Newsprint	5.2	2.6	--	--	--	--	--	--	--	--	--	
Logs	--	--	--	7.1	--	--	--	--	--	--	--	
Bunkers	--	--	--	--	1.0	--	--	--	--	--	--	
Containers	--	--	--	--	1.8	0.2	--	--	--	--	0.6	
Fertilizer	--	--	--	--	--	---	19.2	--	--	--	--	
Automobiles	--	--	--	--	--	--	--	--	--	--	0.9	
Total Inbound	46.4	32.0	42.8	42.6	42.1	8.8	34.5	2.3	1.3	0.6	1.5	(-29.05%)
Total Cargo Movements	1,470.3	1,279.4	1,669.8	1,315.3	1,277.8	1,448.4	1,619.9	1,347.7	1,105.9	1,216.6	1,001.1	(-3.77%)

Source: Port of Astoria; Williams-Kuebelbeck and Associates, Inc.

C. DEMAND FOR MARINE TERMINALS

The attractiveness of the Tongue Point site for marine terminal facilities is largely dependent upon (a) future waterborne cargo demand, (b) proximity of shippers, (c) proximity to receivers, and (d) the ability to upgrade existing rail and ship access to the site. This analysis utilizes the projections for port facilities presented within the Oregon Ports Study - 1980 (referred to as the Port Study hereinafter)[1/] recently completed for the state of Oregon, which forecasts the net demand for various types of port facilities within several sub-state regions. As defined by the Port Study, Tongue Point lies within the Lower Columbia Region, comprising the Port of Astoria, the Port of St. Helens, and the Port of Portland. Within this region are 109 of the 163 berths in the state used for waterborne commerce. These berths are distributed as follows: Portland, 79; Astoria, 19; and St. Helens, 11.

Commodity Forecasts

The Port Study relied upon two types of commodity forecasts to project marine terminal requirements along the Lower Columbia. The first type of forecast was of commodities currently moving through Oregon ports; these were called "existing cargo flows", of which forest products (logs and milled products, such as lumber), wood chips, and grain make up the majority of the state's domestic and foreign trade. Table 6 presents forecasts of Oregon's waterborne foreign trade for the years 1985 through 2000. Of note is the increase in tonnage projected to be moved through the Port of Astoria, thereby reversing the decline illustrated earlier on Table 5. As shown on Table 7, forest products (primarily logs) are expected to remain the major commodity handled within the Astoria area, constituting 66 percent of total exports by the year 2000. Almost all of the remaining exports from Astoria are forecast to be bulk grains, primarily wheat, from the Pacific Northwest.

[1/] Ogden Beeman & Associates, Oregon Ports Study - 1980, for the state of Oregon, July 1980.

Table 6

FORECASTS OF OREGON'S WATERBORNE FOREIGN TRADE

(Thousands of Short Tons)

Oregon Port	Exports			Imports			Total Trade		
	1977	1985	2000	1977	1985	2000	1977	1985	2000
Astoria	1,258	1,781	2,356	32	88	159	1,290	1,869	2,515
Coos Bay	4,817	4,756	4,764	45	56	82	4,862	4,812	4,846
Newport	79	121	121	--	--	--	79	121	121
Portland	6,848	8,607	13,723	2,222	3,036	6,100	9,070	11,643	19,823
TOTAL	13,002	15,265	20,964	2,299	3,180	6,341	15,301	18,445	27,305

Source: Oregon Ports Study-1980; Williams-Kuebelbeck and Associates, Inc.

Table 7

WATERBORNE FOREIGN TRADE BY COMMODITY - YEAR 2000

ASTORIA AREA

(Thousands of Short Tons)

Commodities	Exports	Imports	Total Trade
Fresh seafood	--	--	--
Forest products	1,549	--	1,549
Bulk grains	794	--	794
Bulk minerals and ore	--	--	--
Fertilizers	--	--	--
Iron/Steel products	--	--	--
Motor vehicles	--	--	--
Scrap iron and steel	--	--	--
Coal/lignite	--	--	--
Sand, gravle, crushed rock	--	--	--
Alumina, bauxite	--	--	--
Animal and vegetable oils	--	--	--
Liquid bulk	--	--	--
Petroleum, crude	--	--	--
Petroleum products	--	--	--
Wood chips, fuels	--	--	--
Refrigerated cargoes	--	--	--
General cargoes	13	159	172
Military cargoes	--	--	--
Live animals	--	--	--
TOTAL	2,356	159	2,515

Source: Oregon Ports Study-1980; Williams-Kuebelbeck and Associates, Inc.

The second type of cargo forecast performed in the Port Study was for commodities that historically have been of little or no importance to Oregon ports but which, because of changing demand and transportation factors, are projected to become major opportunities. These "new commodities" are Midwest grain (primarily corn); mini-bridge containers; coal and other large volume bulks; and petroleum.

Net Demand for Port Facilities - 1985 Through 2000

By comparing cargo forecasts with existing port throughput capabilities, the Port Study projected future port facility needs for the year 2000. However, marine terminal demand for the years 1985 and 1990 were not included; these latter two time frames are very important for any short-term decision concerning the use of Tongue Point. Commodity forecasts for 1985 and 1990 were therefore interpolated using the average annual growth in tonnage implied by the 1977-2000 projections. These interpolations were then adjusted to conform to the 1985 trade totals shown earlier on Table 6.

Demand for Facilities Handling Existing Commodities

Using forecasts of existing commodities moving through Oregon ports, Table 8 presents net port facility requirements along the Lower Columbia for the years 1985, 1990, and 2000 (detailed derivations are included in Appendix B). The incremental demand for berths is expected to rise from approximately 4 in 1985 to nearly 22 by the year 2000. The commodities showing the strongest demand in 1985 are logs and forest products, with bulk grains and iron/steel products becoming increasingly important through 1990.

Demand for Facilities Handling New Commodities

With regard to new, rather than existing, commodities, the Port Study projected demand for six marine terminals along the Lower Columbia by the year 2000. These facility requirements are:

Table 8

NET FUTURE FACILITY INCREASE - EXISTING COMMODITIES

LOWER COLUMBIA REGION

YEARS 1985, 1990, AND 2000

Commodity	Number of Additional Berths Required		
	1985	1990	2000
General Cargo			
Noncontainer	--	--	--
Container	0.8	1.4	2.6
Motor Vehicles	--	0.1	1.0
Iron/Steel	0.6	1.5	4.0
Forest Products (excluding logs)			
Astoria			
Noncontainer	--	--	--
Container	0.6	1.0	2.0
Portland			
Noncontainer	0.7	1.2	3.0
Container	--	--	0.7
Logs-Shoreside Loading			
Astoria	0.9	1.6	3.0
Portland	--	--	--
Bulk Grains	0.5	1.6	4.3
Bulk Minerals	0.3	0.6	2.0
Total	4.4	9.0	21.6

Source: Oregon Ports Study-1980; Williams-Kuebelbeck and Associates, Inc.

Midwest Grains	2 berths
Mini-bridge Containers	2 berths
Coal	1 berth
Petroleum	1 berth

Although the Port Study made no mention as to the 1985 or 1990 levels of demand for terminals handling new commodities, the tonnage flows needed to justify terminal development might presumably be achieved before the year 2000. Because of the large degree of uncertainty associated with the forecasts of new commodities, we have not attempted to interpolate commodity flows for earlier years (as was done with existing commodities). Of the four new commodities, however, of potentially greatest importance to Clatsop County is coal. Demand for a coal terminal will be contingent upon Far East coal requirements and upon the competitive transportation economies offered by other West Coast ports. The potential for a coal terminal at Tongue Point is discussed further in a related report by Swan Wooster Engineering.[1/]

Land Requirements - 1985 Through 2000

Existing Commodities

Table 9 presents the land acreage needed to accommodate the projected increases in marine terminals shown on Table 8. Within the Lower Columbia region new port facilities will require approximately 135 acres by 1985, rising to 490 acres by the year 2000.

Table 9 also lists the preferred locations within the Lower Columbia region for each type of cargo-handling facility. Portland, largely because of its proximity to markets and major transportation routes, is identified as the preferred location for terminals handling general cargo containers, motor vehicles, iron/steel products, and non-containerized forest products. Astoria is the preferred location for log handling facilities because of (a) proximity to harvest areas such as the Tillamook Burn; and (b) the area, unlike those upriver, has large amounts of waterfront land suitable

1/ Swan Wooster Engineering, Inc., Tongue Point Coal Terminal Feasibility Study, October 1981.

Table 9

PORT LAND REQUIREMENTS - EXISTING COMMODITIES[1/]

LOWER COLUMBIA REGION

YEARS 1985, 1990, 2000

Commodity	1985 Land Area (Acres)	1990 Land Area (Acres)	2000 Land Area (Acres)	Preferred Location	Reason for Preference
Containers					
General Cargo	30	30	90	Portland	1. Larger population base; 2. Access to I-5, I-80.
Forest Products	30	30	60	No Preference	
Motor Vehicles	--	--	30	Portland	1. Competitive rail service; 2. Access to I-5, I-80; 3. Proximity to market.
Iron/Steel	10	20	40	Portland	1. Proximity to market; 2. Highway access.
Forest Products (Non-Containerized)	15	15	30	Portland	1. Location to production facilities; 2. Location to wood sources.
Logs (Shoreside)	20	40	60	Astoria	1. Location to timerland; 2. Land available for shoreside loading.
Bulk Grains	30	60	120	No Preference[2/]	
Bulk Minerals	--	30	60	No Preference[2/]	
Total	135	225	490		

[1/] Derived from the net future port facility requirements depicted on Table 7 by rounding the number of berths required for each commodity, either up or down depending upon the fraction of demand shown (for example 1.6 berths would be rounded to 2 berths, whereas 1.2 berths would be rounded to 1 berth).

[2/] Unless the Columbia River channel is deepened to accommodate large bulk carriers, grains and minerals are most likely to be exported from Portland due to its proximity to production areas.

Source: Oregon Ports Study-1980; Williams-Kuebelbeck and Associates, Inc.

for the shoreside log handling facilities.[1/] No preference of location is given for containerized forest products. The Port Study assumes demand for this commodity will be met at both Astoria and Portland. There is likewise no preference listed for bulk grains or bulk minerals, although the study points out that Portland - with multiple rail access - has a current advantage. However, if a deeper access channel is created at the mouth of the Columbia River, the Astoria area could accommodate larger vessels which would tend to favor that location for bulk terminals.

New Commodities

The six terminals handling new commodities would require at least 230 acres (Table 10). Portland is generally the preferred site for these facilities given the existing constraints on rail and ship traffic to Astoria. The desirability of Astoria improves dramatically, however, if the Columbia River channel is deepened to allow passage of large bulk carriers and/or rail service between Portland and Astoria is improved.

Potential Terminal Capture - Astoria Area

As indicated previously, some of the cargo terminals exhibiting no locational preference may gravitate to either Portland or the Astoria area, depending upon the shipping opportunities and constraints that exist at each site. Presented below, for the years 1985, 1990, and 2000, are estimates of the number and type of terminals expected to locate within Clatsop County given its existing locational attributes. Total acreages are listed on Table 11, and are considered net additions to the 1977 port land supply.

Potential Capture - Year 1985

By 1985 demand within Clatsop County is expected to be strongest for one additional 20 acre shoreside log handling facility. An additional 30 acres

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[1/] This method of log handling is preferrable because it greatly reduces the water pollution impacts associated with water storage, and also improves the speed of handling and loading.

Table 10

SUMMARY OF PORT FACILITY REQUIREMENTS - NEW COMMODITIES

LOWER COLUMBIA REGION - YEAR 2000

Facility Type	Number of Berths	Acres Per Berth	Total Land Area	Preferred Location
Midwest Grains	2	30	60	No Preference[1/]
Mini-Bridge Containers	2	35	70	No Preference[1/]
Coal	1	100	100	No Preference[2/]
Petroleum	1	Dependent on Facility Purpose	---	Portland
Totals	6		230+	

[1/] The Portland area is favored by competitive rail service to the Midwest; the lower river is favored by a potential for deeper draft ships.

[2/] If the coal terminal was a multi-purpose bulk terminal (requiring at least 30 acres) then Portland would be favored due to its competitive rail access. A special purpose coal terminal (requiring 100 acres, with a much greater throughput capability than the multi-purpose facility), if based on long-term contracts including rail delivery, would tend to favor the lower river due to the potential for increased ship draft and reduced transit time to Pacific Rim ports.

Source: Oregon Ports Study - 1980; Williams-Kuebelbeck and Associates, Inc.

Table 11

POTENTIAL PORT FACILITY CAPTURE

ASTORIA AREA

YEARS 1985, 1990, AND 2000

	1985			1990			2000		
Capture Potential	Type of Facility	Number of Berths	Total Acreage	Type of Facility	Number of Berths	Total Acreage	Type of Facility	Number of Berths	Total Acreage
Probable Capture	Shoreside log-loading	1	20	Shoreside log-loading	2	40	Shoreside log-loading	3	60
				Forest Products	1	15-30[1/]	Forest Products	2-5[2/]	60-100
Subtotal		1	20		3	55-70		5-8	120-160
Possible Capture[3/]	Forest Products (Containerized)	1	30	Bulk Grains	1	30	Bulk Grains	2	60
				Bulk Minerals	1	30	Bulk Minerals	1	30
							New Commodities	1-3	100
Subtotal		1	30		2	60		4-6	190
TOTAL POTENTIAL CAPTURE		2	50		5	115-130		9-14	310-350

1/ Fifteen to twenty acres if forest products are not containerized; 30 acres if forest products are containerized.

2/ Either 2 containerized forest products facilities of 60 acres, or 5 break bulk forest products facilities totalling 100 acres.

3/ Possible capture is contingent upon (a) improvement of rail access from Portland to Astoria; and (b) deepening of the bar and channel of the Columbia River.

Source: Williams-Kuebelbeck and Associates, Inc.

may be required for a containerized forest products terminal assuming the Port of Astoria cannot accommodate such a facility. At present, though, the trend towards containerization of forest products - as had been projected by the Port Study - has not yet become significant.[1/] If forest products are consequently not containerized to any significant extent but instead move through existing break bulk or neo bulk terminals, then no additional acreage will be required for this commodity as sufficient cargo-handling capacity exists within the Astoria area to handle projected forest products tonnages through 1985.

With regard to bulk minerals and bulk grains, upriver ports (such as Portland) are currently favored due to (a) competitive rail service; and (b) shorter distance to suppliers. The Astoria area could become a more competitive location for bulk commodity facilities if both the Columbia River bar and channel are deepened to accommodate larger vessels, thus potentially creating demand for either a new 30-acre bulk grain facility or, more likely, the renovation of the existing grain terminal at the Port of Astoria.

Potential Capture - Year 1990

The strongest demand should continue to be for shoreside log-loading facilities, rising to 2 terminals - 40 acres - by 1990. The amount of land required for a facility handling forest products will again depend upon the mode by which they are moved. If none of the forest products exported through the Astoria area are containerized, then there could be demand for one additional break bulk facility of approximately 15-20 acres in size. Otherwise, as Table 8 indicated earlier, there might be demand for one container facility.

As noted earlier, bulk grains and minerals will most likely move through the Port of Portland unless the channel is deepened and rail access is improved to Astoria. If these two constraints are removed, up to an additional 60 acres of land could be needed at Astoria - 30 acres for

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[1/] Personal communication, Ogden Beeman, August 1981.

one bulk-grain terminal (in addition to the renovation of the Port of Astoria grain facility) and 30 acres for one bulk-mineral facility.

Potential Capture - Year 2000

By the year 2000 new log-loading facilities within the Astoria area could require a total of 60 acres (i.e. an additional 20 acres over the 1990 projected requirement). Demand for forest products facilities could be as high as 5 terminals, or 75-100 acres assuming no containerization of forest products. However, if (as projected by the Port Study) two-thirds of the year 2000 increase in forest products tonnage is containerized, then only 60 acres (2 terminals) will be in demand.

As noted previously with regard to new commodities such as Midwest grains, coal, and mini-bridge containers, the Astoria area becomes very competitive vis-a-vis upriver ports once rail access is improved and the Columbia River channel deepened. As noted earlier on Table 10, by the year 2000 approximately 230 acres are needed along the Lower Columbia to meet projected facility requirements for the handling of new commodities. Capture of one-half of these facilities could boost demand in the Astoria area by approximately 100 acres. Additionally, once rail and water access are improved, the Astoria area becomes more attractive for existing bulk commodities - grains and minerals - being handled through the Port of Portland. The 90 acres required for these commodities in 1990 are expected to double to 180 acres by the year 2000. If Clatsop County captures half of this demand, the acreage required increases by another 90 acres, creating a total potential demand for 310-350 acres.[1/]

Alternative Sites for Marine Terminal Development

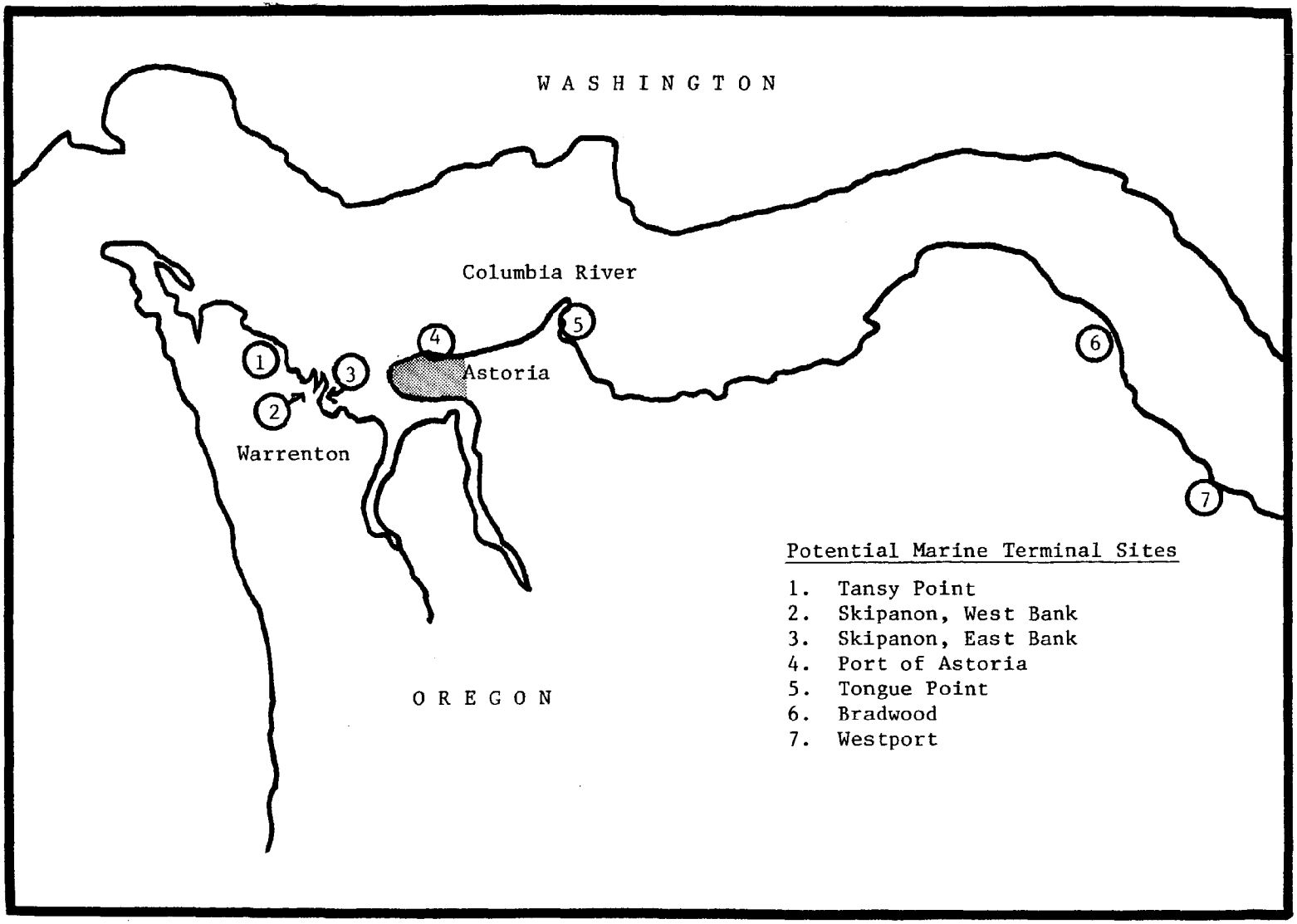
Excluding Tongue Point, Clatsop County has 6 sites that are potentially suitable for marine terminal development. As shown on Figure 5, these sites are:

[1/] The potential demand of 310-350 acres comprises (a) 60 acres for 2 shoreside log-loading facilities; (b) 60-100 acres for forest products facilities, depending upon export mode; (c) 100 acres for facilities handling new commodities - such as one coal terminal; and (d) 90 acres for existing bulk commodity facilities.

Figure 5

POTENTIAL MARINE TERMINAL SITES

CLATSOP COUNTY



Source: Williams-Kuebelbeck and Associates, Inc.

- Port of Astoria. The filling of the port's existing slips, as allowed under the CREST mediated agreement, would provide nearly 30 acres of land for port-related development. When included with the 26 acres west of Pier 3 which are vacant, the total potential land acreage available is approximately 56 acres.

- Tansy Point. Under the CREST mediated agreement at least 98 acres are available for water-dependent industrial use at Tansy Point. In addition, this acreage must, by CREST agreement, have a sufficient configuration to accommodate a loop track. All utilities are available to the site.

- Skipanon, East Bank. This site, owned by the Port of Astoria, has 172 acres (possible 196 acres with fill) available for large scale water-dependent development. All utilities are available to the site.

- Skipanon, West Bank. Owned by Dant and Russell, this 32 acre parcel has been reserved by the company for possible future marine terminal development. All utilities are available to the site.

- Westport. Approximately 225 acres, most of which are owned by Dant and Russell, are potentially available for marine terminal development. The capacity of the area's water system is limited, and the site is not currently served by a sewer system.

- Bradwood. Thirty acres are potentially available, but are constrained in use by (a) poor road access to U.S. Highway 30; and (b) lack of utilities.

In sum, 613 acres of water-oriented land - in addition to Tongue Point - are potentially available for marine terminal development. Each of these alternative sites, however, suffers from constraints which make them less attractive for port development than Tongue Point. For example, cargo traveling west by

rail to the Port of Astoria would have to traverse an aging trestle that is inadequate for large loads such as those carried by unit trains. Upgrading this section of the Burlington Northern line, from Tongue Point to the Port of Astoria, may cost as much as $17 million.[1/] Further rail improvements will be required to adequately serve Tansy Point or either of the two Skipanon sites. These properties rely upon rail access across Young's Bay; use of the rail line for bulk cargo would require additional track upgrading and the probable replacement of the bridge trestle across Young's Bay.

Those sites to the east of Tongue Point have a slight advantage in that the length of track requiring upgrading will be reduced. This gain is offset, however, by the increased length of channel that will need deepening to accommodate modern deep-draft bulk carriers.

Conclusion: Suitability of Tongue Point for Marine Terminals

The conclusions drawn from this analysis are two-fold. First, the best location within Clatsop County for a major bulk terminal - such as a coal terminal requiring 100 acres of land and a 50-foot ship draft - is Tongue Point. To develop potential sites further west will require very extensive and expensive rehabilitation of rail facilities. Sites to the east will require channel deepening beyond Tongue Point along with improvements in road access and utilities.

Second, with regard to commodities not requiring extensive channel deepening or rail upgrading (such as logs and forest products), Tongue Point still ranks as a competitive terminal site given the attributes presented above. In essence, Tongue Point has an excellent potential for capturing cargo-handling facilities desiring a location in Clatsop County. Potential acreage requirements for the Astoria area are as follows:

[1/] Morgan and Bartl, Op. Cit., p. 59.

- Year 1985. The most likely demand is for 20 acres to accommodate shoreside log-loading facility. An additional 30 acres may be required for a containerized forest products facility, but at present forest products seem most likely to be handled as break bulk cargo, eliminating the need for an additional terminal.

- Year 1990. The most likely demand is for 55-70 acres, comprising (a) 2 shoreside log-loading facilities (40 acres), and (b) either one forest products break bulk facility of 15-20 acres or one forest products container facility of 30 acres. Improved water and rail access to Astoria could increase demand by an additional 60 acres comprising one bulk grain terminal and one bulk mineral terminal.

- Year 2000. The most likely demand is for 120-160 acres, comprising (a) 3 shoreside log-loading facilities (60 acres), and (b) 60-100 acres for forest products facilities, depending upon export mode.

  In addition, if rail access to Astoria is improved to adequately accommodate trains carrying large amounts of bulk cargo (e.g. coal), and if the Columbia River channel is deepened to accommodate deep-draft ships - such as those in the 100,000+ deadweight-ton range, then Tongue Point could be a very competitive site for terminals handling bulk commodities. The port-related land area required at Tongue Point might potentially increase by approximately 190 acres if facilities handling new and existing bulk commodities are included, bringing total land demand up to 310-350 acres by the year 2000.

D. DEMAND FOR NON-PORT INDUSTRIAL LAND

Non-port industry is simply defined as manufacturing activities not requiring access to a major cargo-handling facility as part of their production process (although, of course, a port facility may be required at some other point, such as when transporting a finished product to its markets). Most of the non-port industry in Clatsop County is focused on either forest products or seafood processing, both of which are undergoing a recession. Table 12 indicates that of the county's 30 major manufacturers, 22 - or 73 percent - are involved in these two sectors. To a certain extent the forest products and seafood industries are both dependent on the Columbia River, using it primarily as a transportation route for raw materials.

Methodology

The potential market for industrial land is traditionally determined by first projecting future employment levels and then translating these into demand for industrial land. The projected supply of developable industrial-zoned vacant land is then compared to the projected demand to determine if demand can be satisfied.

This analytical procedure is difficult to apply in Clatsop County, however. Employment in manufacturing is currently on the decline, thus preventing the use of employment trends to project demand for industrial land. Additionally, for some industries the relationship between production levels and employment is not necessarily strong. For example, the CTIC found that in 1971, 1973 and 1974 employment in the lumber and wood products sector totalled 1,020 employees annually, while during the same years the annual timber harvest varied as much as 223.4 million board feet.[1/] In essence, we must therefore rely either upon demand projections performed by other agencies (as has been done with seafood processing) or upon a qualitative judgment regarding an industry and its potential strength.

[1/] Bartl and Morgan, Op. Cit., p. 34.

Table 12

CLATSOP COUNTY MANUFACTURERS

(With 10 or More Employees)

1980 to 1981

Firm	Number of Employees	Code	SIC Classification
Astoria			
Bumble Bee Seafoods	350	2091	Seafood Preparation
Astoria Plywood Corp.	235	2436	Plywood Manufacture
Ocean Foods of Astoria	105	2092	Seafood Preparation
Astoria Seafood Co.	50	2092	Seafood Preparation
Astorian-Budget Publish. Co.	50	2711	Newspaper Publishing
Corinthian Astoria	50	2092	Seafood Preparation
Pacific Whitting Inc.	40	2092	Seafood Preparation
Bumble Bee Shipyard & Shop	30	3732	Boat Building & Repair
Astoria Fish Factors, Inc.	25	2092	Seafood Preparation
Astoria Marine Construction	23	3731	Ship Building & Repair
Johnson Logging	20	2411	Logging
Rainbow Creations	20	Unknown	--
Auto Co. Inc.	18	3551	Food Products Machinery
American Can Co.	15	3411	Metal Cans
Blind Slough Logging, Inc.	15	2411	Logging
Home Baking Company	14	2051	Bakery Products
Hammond			
Alaska Packers Association	80	2092	Seafood Preparation
Seaside			
Crown Zellerbach Corp.	350	2411	Logging
Boise Cascade Corp.	100	2411	Logging
Bell Buoy Crab Co.	45	2091	Seafood Preparation
Harrison's Bakery	13	2051	Bakery Products
Seaside Signal	12	2711	Newspaper Publishing
Kohl, Inc.	12	2428	Sawmill
Warrenton			
Warrenton Lumber Co.	165	2421	Sawmill
Lektro, Inc.	50	3537	Trucks and Trailers
Bioproducts Inc.	45	2048	Grain Mill Products
New England Fish Co.	45	2092	Seafood Preparation
Carruthers Co., EH	21	3551	Food Products Machinery
Pacific Shrimp Inc.	17	2091	Seafood Prepartion
Wauna			
Crown Zellerbach Corp.	775	2621	Paper Mill

Source: Clatsop-Tillamook Intergovernmental Council (based on information from the Oregon Department of Economic Development and the Clatsop County Economic Development Committee).

The following sections define and project, for Clatsop County, the demand for seafood processing facilities, forest product facilities, and other industrial facilities.

Demand for Seafood Processing Facilities

The Pacific Northwest fishing industry is now in a position to exploit new resource opportunities, largely due to (a) the establishment of the 200-mile jurisdiction zone; (b) a reduction of industry reliance on high-value species; (c) increasing demand for frozen products; and (d) growth in foreign capital investment.[1/] As a result of these trends, bottomfish - specifically hake and rockfish - have become the species with the greatest harvest potential.

Because of their tendency to decay rapidly, bottomfish usually undergo some form of shipbound processing, thereby ensuring the quality of the product. However, operations near the Oregon Coast can create some demand for on-shore processing and storage facilities. These facilities can be developed as part of processing plants that handle other species. Plans committed solely to bottomfish processing will probably not be developed until after the industry develops and uses the harvesting/processing vessels needed to take advantage of fisheries other than those near the shore. This technological lag may prevent establishment of bottomfish processing plants on the Lower Columbia until after 1985.[2/]

Although a number of studies have concluded there is a need for additional bottomfish processing facilities within the Pacific Northwest, only one study, completed in 1979 for the National Oceanic and Atmospheric Administration (NOAA), has specifically analyzed demand for plants in Oregon.[3/]

[1/] CH2M Hill, Op. Cit., p. 3-5.

[2/] CH2M Hill, Op. Cit., p. 11-3.

[3/] Earl R. Coombs, Inc., Prospects for Development of the U.S. Fisheries, National Oceanic and Atmospheric Administration, 1979.

The NOAA study estimated that up to six plants might be required to handle the projected catch off Oregon. Additionally, the 1980 WPPA study found a potential demand for two fish processing plants on the Washington side of the Columbia River.[1/] These two plants could conceivably be located on alternative sites in Oregon. Again, demand for these facilities is expected to occur primarily after the year 1985.

A fish processing facility requires approximately 2.5-3.0 acres of land area.[2/] A total of 8 processing plants could absorb up to 20-24 acres. A location near the waterfront is desirable, although facilities built out over the water on pilings are no longer considered attractive due to extra maintenance costs involved.[3/] Clatsop County could conceivably capture 2 to 3 of the 8 plants; the remainder will most likely locate along other parts of the coast in order to minimize ship-to-plant travel time.

Demand for Forest Products Industries

The future of the Clatsop County forest products industry is dependent upon the following factors:

- Yields from North Coast timberland. At present, Oregon timber yields are on the decline. In some parts of the state this trend will continue into the next century. The North Coast timbershed, within which Clatsop County is located, is fortunate as it contains the Tillamook Burn. Expected to reach harvestable maturity within two decades, timber yields from the Burn should increase the current North Coast timberland harvest by one-third.

- Location of processing facilities. Because of its location south of Highway 26, the timber harvested within the North Coast timberland could be transported to processing facilities within the Willamette

1/ CH2M Hill, Op. Cit.

2/ CH2M Hill, Op. Cit.

3/ Personal communication, Jim Bergeron, Clatsop County Marine Extension Agent, August 1981.

Valley, on the coast (e.g., Coos Bay), or along the Columbia River. Regarding the latter location, the Columbia River, two companies have land reserved near Wauna for future plant expansion. Specifically, the Crown Zellerbach Company has 464 vacant acres near its pulp mill targeted for future plant expansion or related facilities. Dant and Russell also owns 188 acres adjacent to the Crown Zellerbach pulp mill, and intends to use this when harvest volumes increase.[1/] Both of these sites are near the main ship channel and are suitable, with minor alteration, for a water dependent facility. Additionally, the Warrenton Lumber Company (a subsidiary of Dant and Russell) has been exploring the possibility of constructing a deep draft loading facility adjacent to its site on the west bank of the Skipanon.

- Demand for wood products. The demand for wood products from the Pacific Northwest, particularly lumber, is currently in a slump. Partly for this reason legislative efforts are underway to extend the ban on export of logs from federally-owned lands to include the export of logs from all lands. As these exports constitute a major cargo for Oregon ports, a ban or reduction of log exports could dramatically improve the demand for mill facilities due to the substitution of lumber for logs shipped to overseas markets. The exact level of mill demand will depend heavily upon the extent to which importing countries can substitute loss of logs from the U.S. with logs from other countries, such as Canada or Korea.

The future demand for forest product industrial facilities is consequently based on a number of unknowns. If additional facilities are needed, they probably will not come on line until after 1990, perhaps as late as 2000. Assuming a new facility is required, the land area needed will be relatively large in order to store both unmilled logs and the finished product, such as wood chips or lumber.

[1/] Bartl and Morgan, Op. Cit., p. 9.

Demand for Other Industrial Land

Within Clatsop County there has been little industrial activity other than that found in the forest products and fish processing sectors. This is in large part due to the county's distant location from the major urban areas and interstate transportation networks of the Pacific Northwest; conditions likely to remain unchanged unless rail access from Portland to Astoria is improved. On the positive side, the county possesses a pleasant environment and a plentiful supply of vacant industrial land. So far, however, industrial development within the county has been oriented towards either the local population or resource base. Other industries, if they have located in the Northwest Oregon/Southwest Washington area, have been more likely to gravitate towards Longview or Kelso where they are served by a major port, two competing rail lines, and Interstate Highway 5.

To stimulate industrial development, therefore, Clatsop County cannot passively rely upon its attributes alone, as these have so far been relatively insignificant in attracting firms other than those involved in seafood processing or forest products manufacturing. Local officials must consequently actively market the county to outside interests. The methods needed to undertake such an activity are beyond the scope of this report; but the CEDC has already taken the initial steps that are required. First, in 1977 the Committee targeted four industries for recruitment; these are boat building, the wool yard industry, textbook publishing, and engineering and scientific instruments. Second, the CEDC has recently hired a consultant to prepare two reports. The first is a countywide labor force survey detailing such items as employment - trends, skills available, unemployment rates.[1/] This document was published in June 1981. The second report, still in draft form, is a "community audit" of the county, examining the physical setting, industrial sites available, manufacturers, utilities, housing availability, and so on.[2/] By providing an inventory of community facilities and economic trends the CEDC has taken a beginning step towards recruiting new industry into the area.

1/ Clatsop Economic Development Committee, "Labor Force Survey for Clatsop County, Oregon", June 1981.

2/ Clatsop Economic Development Committee, "Clatsop County Community Audit", Draft, August 1981.

Supply of Industrial Land

The Clatsop EDC has recently prepared an inventory of vacant industrial land located in the north part of the county (see Table 13 and Figure 6). According to their estimates, approximately 1,327 acres are available for some form of industrial use. Of this amount, 860 acres (64.8 percent of the total) have no water access; the remainder have water access that is either too shallow for cargo vessels (but may still be suitable for fishing boats, barges or log rafts) or is oriented to deep channel traffic.

Conclusion: Demand for Non-Port Industrial Land

Given the large amount of land available within Clatsop County for industrial development (1,327 acres, of which more than 35 percent have water access), Tongue Point will face heavy competition for any use other than deep draft cargo-handling facilities. This magnitude of potential supply is imbalanced in that non-port industries are not expected to constitute an important segment of Clatsop County's industrial land market. Demand for new seafood processing facilities - assuming it is not partially or entirely met through existing plants - should become apparent after 1985, growing steadily through the next two decades. Perhaps 9 acres of land could consequently be required for this use by the turn of the century. Demand for additional forest products facilities will rely heavily upon the extent to which future timber yields and production requirements overburden existing and planned facility capabilities, a situation which, at present, cannot be predicted with any confidence. While some types of firms could find Clatsop County a suitable location for a plant, there has as yet been little activity other than in the forestry or seafood sectors. Indeed, the San Francisco YMCA has had little success marketing their 600 acre parcel at Warrenton.

Table 13

INVENTORY OF INDUSTRIAL SITES

CLATSOP COUNTY

Map Codes	Name	Acreage	Suitable Industrial Use	Access	Utilities Available	Environmental Constraints
Major Sites						
A-1	Tansy Point	80	WDI	W,RR,H	All	None
A-2	South Warrenton	35	LI	H	All	Drainage
A-3	YMCA Warrenton	660	HI	H	All	None
A-4	Airport Industrial Park	65	LI	A,RR,H	All	None
A-5	West Bank Skipanon	32	WDI	RR,H,W,	All	Dredging and filling of nearby wetlands
A-6	East Bank Skipanon	130	WDI	RR,H,W,	All	Adjacent wetlands
A-7	Deucker Site	55	LI	H	All	None
A-8	Port of Astoria	50	WDI	W,RR,H	All	None
A-9	Tongue Point	150+	WDI	W,RR,H	All	Depends on project (e.g., extent of fill, etc.)
Minor Sites						
B-1	Hammond	4	WDI	H,W,RR	All	None
B-2	Warrenton Boat Basin	10	WDI	H,W,RR	All	None
B-3	South Astoria - PP&C	4	LI	W,H,	All	Dredging and filling
B-4	Miscellaneous Canneries	18	LI	W,RR,H	All	Depends on project (e.g., extent of fill, etc.)
B-5	East Mooring Basin	4	LI	H,W,RR	All	None
B-6	Bradwood	30	WDI	W,RR	None	Dredging adjacent wetlands for water access; Highway access is poor.

1/ WDI-Water Dependent Industrial; LI-Light Industrial; HI-Heavy Industrial.

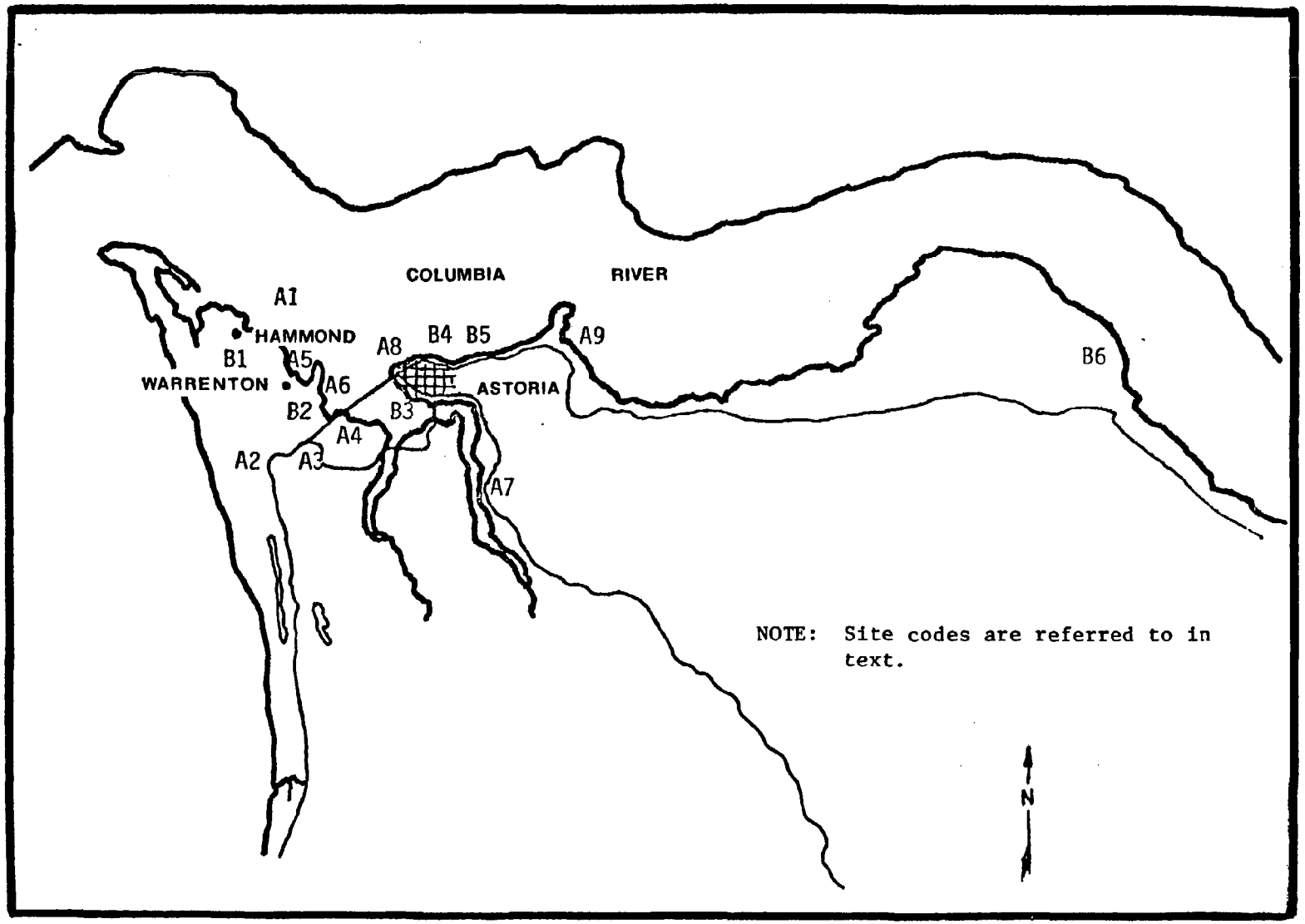
2/ W-Water Access; RR-Railroad Access; H-Highway Access; A-Air Access.

Source: Clatsop Economic Development Committee; Clatsop-Tillamode Intergovernmental Council; Williams-Kuebelbeck and Associates, Inc.

Figure 6

LOCATION OF VACANT INDUSTRIAL LAND

CLATSOP COUNTY



Source: Clatsop Economic Development Committee; Williams-Kuebelbeck and Associates, Inc.

V. ALTERNATIVE DEVELOPMENT SCENARIOS

Based upon the findings presented in the preceding chapters, alternative development scenarios were identified for the Tongue Point site. These include three alternatives for the north parcel and four alternatives for the south parcel. Each alternative is described below.

A. NORTH PARCEL ALTERNATIVES

Findings from the market analysis and the assessments of site characteristics and relevant land use plans/policies indicate that the north parcel is well suited for certain types of marine terminal facilities. The conclusions of the market analysis were used to formulate the following three development scenarios.

Scenario N1 - Coal Terminal

This scenario calls for the development of a 100 acre coal export facility with an annual throughput capability of 10 million short tons (see Figure 7). It should be noted that the site is of sufficient size to accommodate expansion to 150 acres, or 15 million short tons.

The 10 million ton facility will require major site improvements, structures and equipment. These improvements and their costs are itemized in Table 14. In order to develop the north parcel as a deep draft marine terminal, certain basic site improvements will be required. Such improvements are estimated to cost $13.9 million and include the dredging of a 500 feet wide by 40 feet deep navigation channel and a 1,500 feet wide by 25 feet deep turning basin, and the filling of at least a portion of the area between the existing piers. The construction of these basic improvements will bring the site up to a "ready-to-build" condition (i.e. a 100 acre site with adjacent deep water access ready to be developed with marine terminal facilities).

FIGURE 7

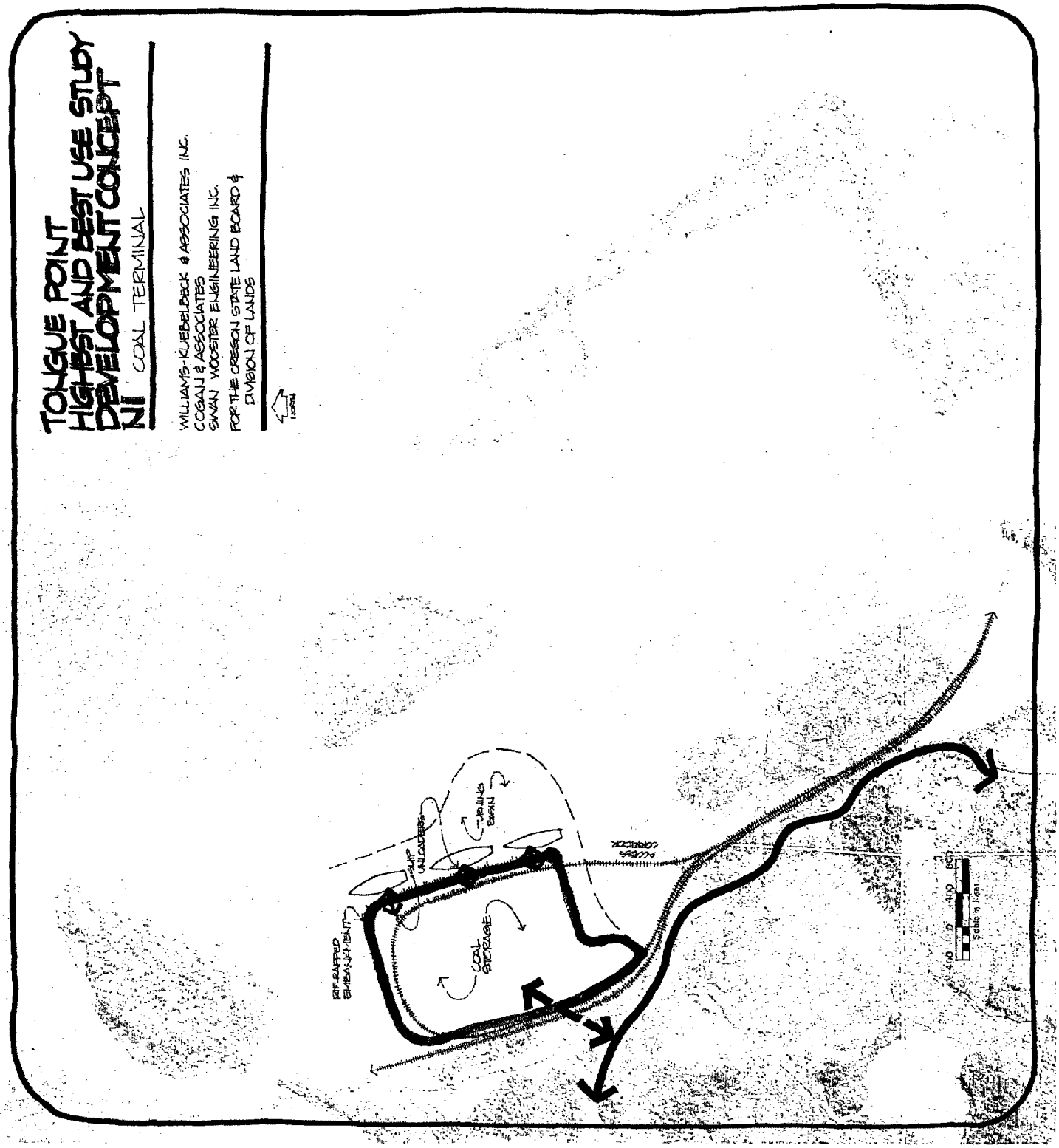

TONGUE POINT
HIGHEST AND BEST USE STUDY
DEVELOPMENT CONCEPT
NI COAL TERMINAL
WILLIAMS-KUEBELBECK & ASSOCIATES INC.
COGAN & ASSOCIATES
SWAN WOOSTER ENGINEERING INC.
FOR THE OREGON STATE LAND BOARD &
DIVISION OF LANDS
NORTH
RIP RAPPED EMBANKMENT
SHIP UNLOADERS
TURNING BASIN
COAL STORAGE
ACCESS ROAD
0
400
800
Scale in Feet

Table 14

SCENARIO N1 - COAL TERMINAL

DEVELOPMENT COSTS[1/]

(In Thousands)

Basic Site Improvements		
Demolition of Existing Piers	$ 680	
Dike Construction	1,178	
Dredging and Filling	4,312	
Fill Compaction and Dewatering	3,928	
Bank Protection	1,223	
	$11,321	
Contingencies at 10 Percent	1,179	
Engineering and Construction Maintenance	1,400	
Subtotal-Basic Site Improvements		$13,900
Coal Terminal Improvements		
Site Preparation and Utilities	$ 2,500	
Terminal Rail Trackage	1,800	
Rail Trestle Across Wetlands	600	
Railcar Unloading	8,500	
Stockpiling and Reclaiming	18,800	
Marine Structures	8,800	
Ship Loading	7,800	
Sampling Facility	800	
Administration and Maintenance Buildings	700	
Pollution Controls	4,000	
Electrical	8,000	
Mobile Equipment and Spares	3,200	
	$65,500	
Contingencies at 10 Percent	6,600	
Engineering, Procurement and Construction Maintenance	7,300	
Subtotal-Coal Terminal Improvements		$79,400
Total		$93,300

[1/] All costs reflect September 1981 prices.

Source: Swan Wooster Engineering, Inc.

The additional improvements required for a coal terminal with a throughput capability of 10 million short tons per year are estimated to cost $79.4 million. As shown in Table 14, total costs associated with Scenario N1 are therefore estimated at $93.3 million.[1/]

Scenario N2 - Three Berth Terminal

This scenario, illustrated in Figure 8, incorporates one break bulk or container facility for forest products, one shoreside log loading terminal, and one mini-bridge container facility. A total land area of 105 - 120 acres would be required, as shown below:

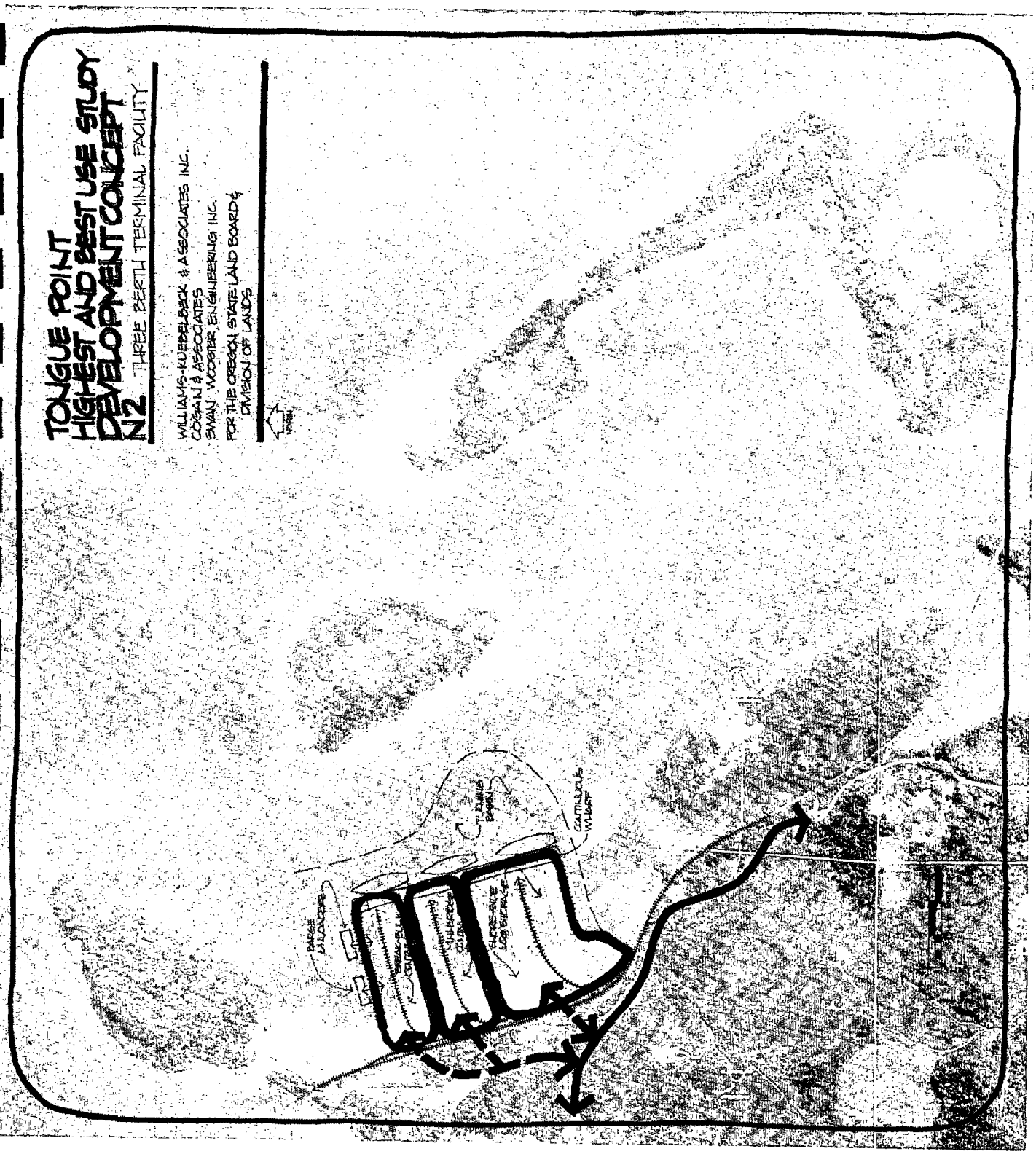
	Acres
1 Break bulk or container terminal for forest products	20-35
1 Shoreside log loading terminal	50
1 Mini-bridge container terminal	35
	105-120

The basic site improvements ($13.9 million cost) identified for Scenario N1 are also applicable for Scenario N2. In addition, the following improvements would be required:

1. Construction of a continuous wharf along the east face of the fill, 2,350 feet long, more or less.
2. Surfacing 23 acres, more or less, with A.C. pavement, of the break bulk/container handling yard.
3. Surfacing of 22 acres, more or less, with A.C. pavement, of the mini-bridge container yard.
4. Surfacing with quarry rock 22 acres, more or less, of the log handling yard.

[1/] These figures do not include the cost to upgrade the Burlington Northern Railroad line between Portland and Tongue Point. That cost has been estimated at $30 to $35 million.

FIGURE 8


TONGUE POINT
HIGHEST AND BEST USE STUDY
DEVELOPMENT CONCEPT
N2 THREE BERTH TERMINAL FACILITY
WILLIAMS-KUBBELBECK & ASSOCIATES INC.
COGAN & ASSOCIATES
SWAN WOOSTER ENGINEERING INC.
FOR THE OREGON STATE LAND BOARD &
DIVISION OF LANDS
NORTH
BARGE LOADERS
CAMILLUCK WHARF

5. The container berth(s) should be equipped with one container crane each. If the forest products were to be shipped as break bulk, loading most likely would be done by ship's gear. A smaller capacity whirley crane could be provided in lieu of one container crane to load ships with inadequate lifting gear. Logs are most frequently loaded by ship's gear, but one whirley crane might be provided to load ships without or with inadequate gear.

6. A rail spur should be brought on site for loading of the mini bridge containers and enough siding should be available for storage of one full and one empty unit train. Mobile equipment should include straddle carriers or fork lifts for handling of containers or break bulk cargo on shore. Log stackers will be required for operation of the log yard.

Costs associated with these terminal improvements are estimated at $41.0 million as shown in Table 15. Including the basic site improvement costs raises the total cost of Scenario N2 to $54.9 million.

Scenario N-3 - Bulk Cargo Terminal

This scenario provides up to three berths for handling dry bulk commodities other than coal. A mix of two bulk grain terminals and one bulk mineral facility was assumed. As shown in Figure 9, it was further assumed that grain will arrive by unit train from the Midwest and by barge from the upper Columbia River region. Trains may be unloaded from a spur track, as illustrated, or from a loop track. The state of the art in grain transfer technology suggests that a loop track would be preferable. In either case, sufficient siding should be provided for rail car storage. A barge unloading facility could be located along the north face of the fill.

For the purpose of this analysis, costs were prepared for a "starter" grain terminal facility with an initial throughput capacity of one million short tons per year (one berth) and the potential for expansion. In light of the uncertainty regarding the nature of the bulk minerals that might be transported through Tongue Point, it was difficult to determine the type of marine structures, warehousing, and rail access that would be needed. Therefore, only the facility requirements and costs for a grain terminal have been addressed.

Table 15

SCENARIO N2 - THREE BERTH TERMINAL FACILITY

DEVELOPMENT COSTS[1/]

(In Thousands)

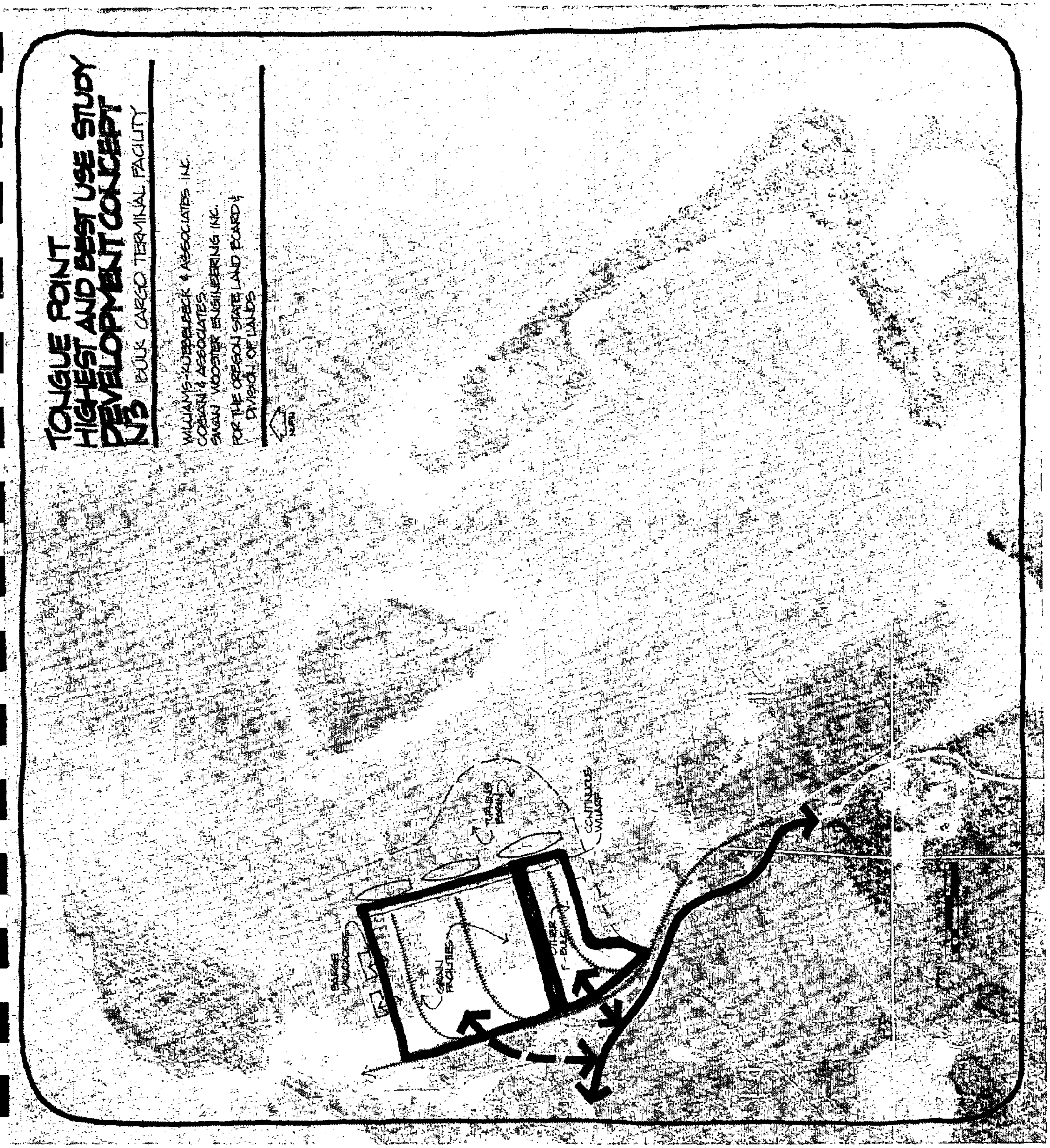
Basic Site Improvements[2/]		$13,900
Terminal Improvements		
Wharf	$12,400	
A.C. Surfacing	2,200	
Quarry Rock Surfacing	1,200	
One Container Crane	4,300	
Two Whirley Cranes	3,400	
Rail Trackage	1,600	
Mobile Equipment	2,300	
Electrical and Lighting	2,500	
Utilities and Miscellaneous	2,500	
Equipment	1,500	
	$33,900	
Contingencies at 10 Percent	3,400	
Engineering, Procurement and Construction Maintenance	3,700	
Subtotal-Terminal Improvements		$41,000
Total		$54,900

[1/] All costs reflect September 1981 prices.

[2/] See Table 14 for itemized costs.

Source: Swan Wooster Engineering, Inc.

FIGURE 9


TONGUE POINT
HIGHEST AND BEST USE STUDY
DEVELOPMENT CONCEPT
N3 BULK CARGO TERMINAL FACILITY
WILLIAMS-KUEBELBECK & ASSOCIATES INC.
COGAN & ASSOCIATES
SHAW WOOSTER ENGINEERING INC.
FOR THE OREGON STATE LAND BOARD &
DIVISION OF LANDS

Development costs for Scenario N3 include basic site improvements at $13.9 million and terminal improvements for a starter facility at $35.0 million, for a total of $48.9 million (see Table 16).

B. SOUTH PARCEL ALTERNATIVES

Alternative development scenarios were also identified for the south parcel based upon findings from the market, site, and land use plan/policy analysis. That analysis revealed that the land use policies of the mediation agreement serve to limit the development potential of the south parcel more so than either market or site conditions. In particular, the mediation agreement's designation of an access channel not to exceed a depth of 25 feet precludes the development of a deep draft marine terminal at the south parcel. In light of that policy, four development scenarios, none of which require deep channel access, were formulated. They are described below.

Scenario S1 - Barge/Rail Transshipment Facility

This facility, as illustrated in Figure 10, would receive grain and/or other bulk commodities for conveyance to ocean-going vessels at the north parcel. It would include a loop track for receiving bulk commodities via unit trains, a barge dock and tie-up dolphins for waiting barges, a barge unloader and a conveyor system for moving cargo to storage or directly to ships at the north parcel.

Basic site improvements required for this scenario are discussed below:

1. A grade separation would need to be constructed for the access road where it crosses the railroad tracks. This would be required, even if only to keep access open to the Corps of Engineers field station, whenever use of the north parcel calls for unit train traffic. The nature and cost of this overpass would depend on the amount of traffic carried. For the light traffic generated by the Corps, a simple timber structure would suffice.

2. Existing upland vegetation would need to be cleared and grubbed and some fill placed to bring the land to uniform grade. Ogden Beeman and Associates have suggested, as an

Table 16

SCENARIO N3 - BULK CARGO TERMINAL

DEVELOPMENT COSTS[1/]

(In Thousands)

Basic Site Improvements[2/]		$13,900
Terminal Improvements		
Wharf 800 Feet Long	$ 4,200	
Shiploader	2,500	
Rail Trackage	1,600	
Rail Receiving and Weighing	1,500	
Barge Dock	300	
Barge Unloading and Weighing	2,000	
Storage for 60,000 Short Tons	10,000	
Cleaning	500	
Shipping and Weighing	3,000	
Dust Control	1,500	
Electrical	1,500	
	$28,600	
Contingencies at 10 Percent	2,900	
Engineering, Procurement and Construction Maintenance	3,500	
Subtotal-Terminal Improvements		$35,000
Total		$48,900

[1/] All costs reflect September 1981 prices.

[2/] See Table 14 for itemized costs.

Source: Swan Wooster Engineering, Inc.

FIGURE 10


TONGUE POINT
HIGHEST AND BEST USE STUDY
DEVELOPMENT CONCEPT
BARGE/RAIL TRANSSHIPMENT FACILITY
WILLIAMS-KUEBELBECK & ASSOCIATES INC.
COGAN & ASSOCIATES
SWAN, WOOSTER ENGINEERING INC.
FOR THE OREGON STATE LAND BOARD &
DIVISION OF LANDS
OPTION B
BARGE UNLOADERS
TO OCEAN BOUND VESSELS

interim use, to keep the site available for disposal of spoils from the maintenance dredging of access channel and turning basin. In this manner the initial filling could be accomplished at a minimum cost.

3. Basic utilities would need to be provided. These include water, sanitary sewage disposal and electrical power and lighting. At present, the city of Astoria will not approve furnishing industrial water by the outlying water districts it serves. This may be a limiting factor for some development schemes. Sewage disposal will require construction of a pump station and a force main to the city's sewer system in addition to on-site collector lines. Power supply should not be a problem.

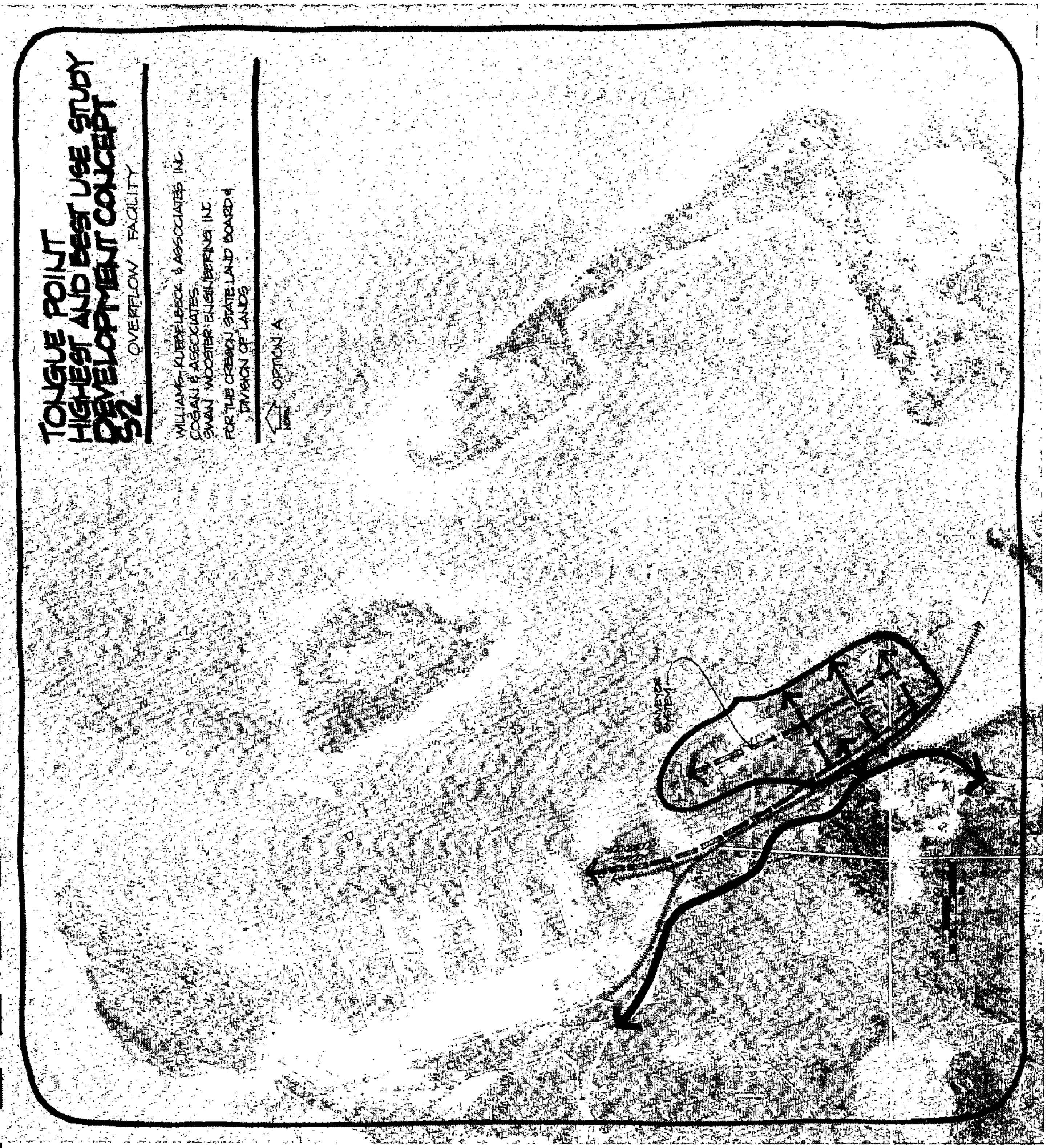
For reasons explained fully in Chapter VI - Evaluation of Alternatives, costs were not estimated for this alternative. In essence, we concluded it is not likely that the south parcel will be needed for receiving and conveying bulk commodities to the north parcel. This is primarily due to (a) the availability of enough backup land at the north parcel to store the maximum volume of cargo that three berths can handle and (b) the ability of the north site to accommodate barges and unit trains on-site.

Scenario S2 - Overflow Facility

An overflow facility would provide backup acreage for the storage of cargoes moving through the north site (see Figure 11). It could be used, for example, to store coal of different grades (i.e. BTU content and sulphur content) or as a site for a coal blending operation. In concept, it could alternatively be used to store containers, break bulk cargo or dry bulk commodities.

This scenario's greatest limitation, however, is the availability of adequate land at the north parcel to meet the backup land requirement of a three berth terminal. (Given the approximately 2,600 feet of wharf that can be constructed at the north parcel, it is only possible to develop 3 deep water berths at that location. The potential for up to 150 acres of land adjacent to the berths is more than adequate to meet the needs of all types of terminals with the possible exception of a very large coal facility.) It appears

FIGURE 11


TONGUE POINT
HIGHEST AND BEST USE STUDY
DEVELOPMENT CONCEPT
OVERFLOW FACILITY
WILLIAMS-KUEBELBECK & ASSOCIATES INC.
COGAN & ASSOCIATES
SWAN WOOSTER ENGINEERING INC.
FOR THE OREGON STATE LAND BOARD &
DIVISION OF LANDS
OPTION A
CONVEYOR SYSTEM

that the only foreseeable use under this scenario would be to accommodate an expansion phase for a coal terminal on the north parcel.

As with Scenario S1, development costs were not estimated for Scenario S2.

Scenario S3 - General Industrial Development

This scenario envisions an industrial park type of development providing for light industrial, warehousing, and office uses (see Figure 12). It could include, for example, such uses as fish processing plants, wood product manufacturing, boat building, port related service industries and industrial related office space. Rail spurs could be provided to serve industrial sites.

Improvements required to implement this scenario would include the basic site improvements described for Scenario S1 (i.e. grade separation at the railroad track, clearing of existing vegetation, and provision of required utilities). It has been assumed that the costs of developing buildings and related site improvements would be incurred by a developer/lessee rather than by DSL.

Scenario S4 - Shoreside Log Storage

This scenario (Figure 13) is similar to the current use of the north parcel by Dant and Russell. However, due to the mediation agreement's designation of a portion of the wetlands area as natural aquatic, it would be necessary to construct a trestle over the wetlands to convey logs to the upland area. Additional improvements required would include:

1. A yard area surfaced with quarry rock.
2. A booming area with tie-up dolphins for log rafts.
3. A bridge crane or similar equipment for lifting logs from the water.

FIGURE 12

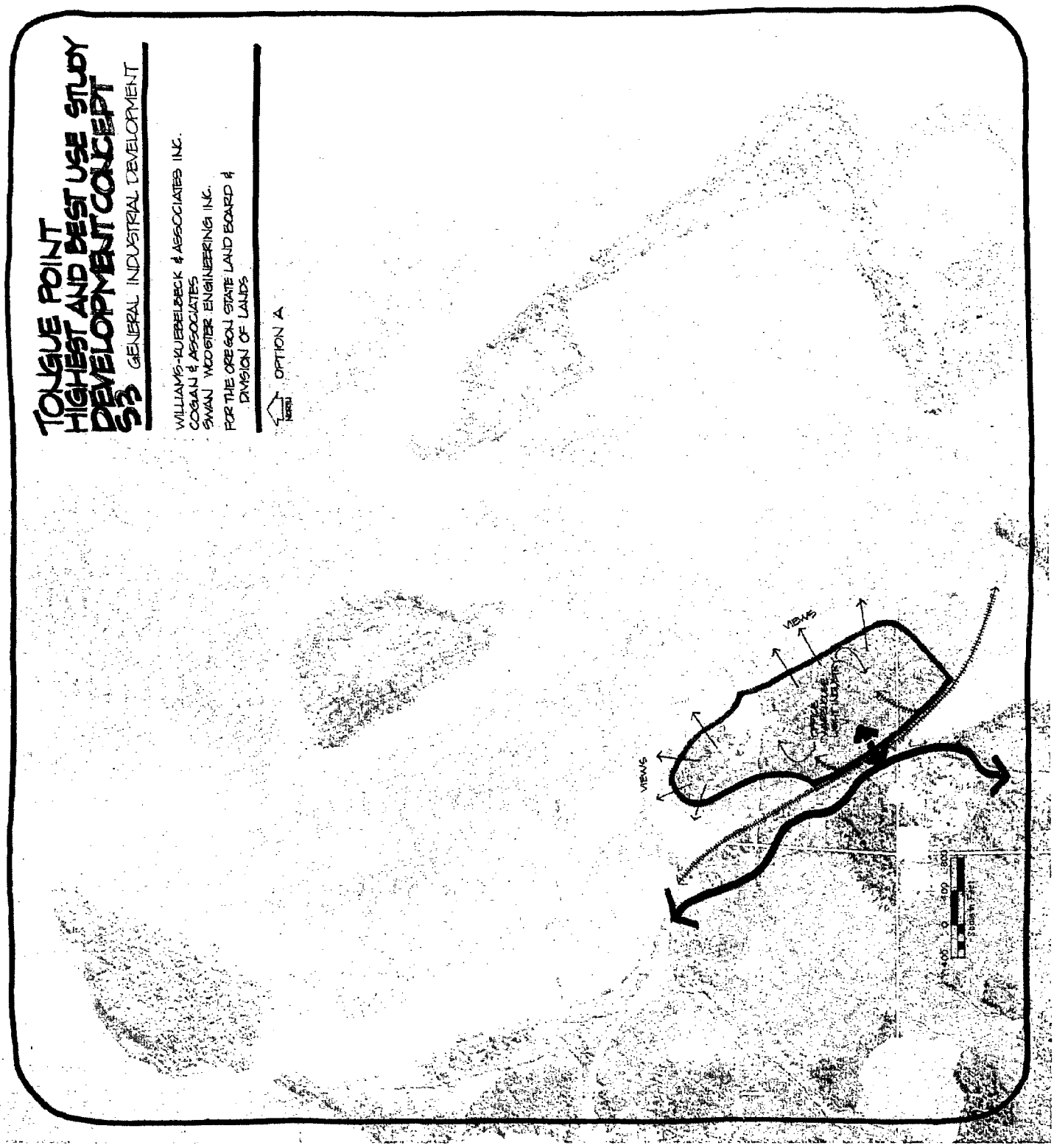
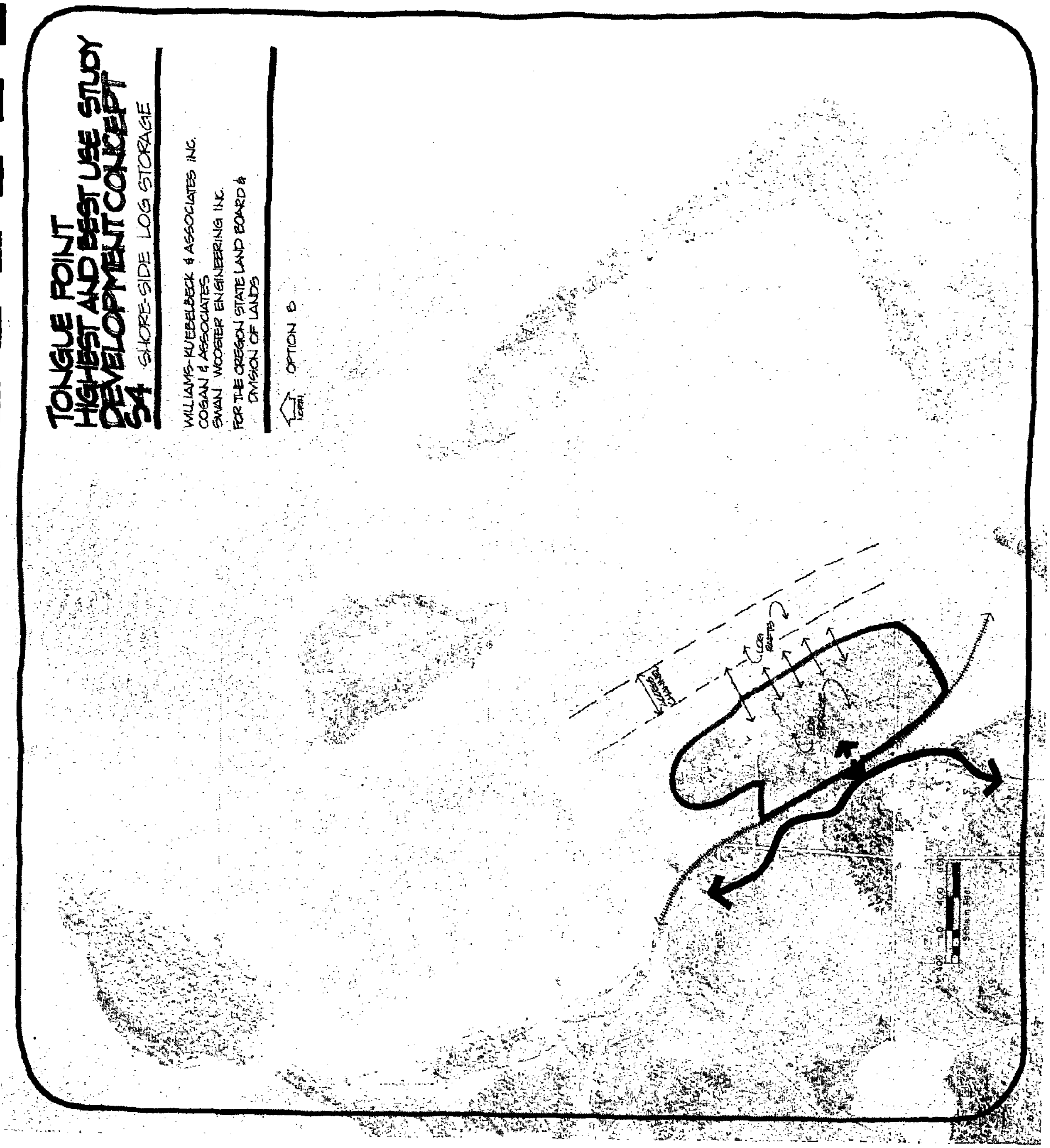

TONGUE POINT
HIGHEST AND BEST USE STUDY
DEVELOPMENT CONCEPT
S3 GENERAL INDUSTRIAL DEVELOPMENT
WILLIAMS-KUEBELBECK & ASSOCIATES INC.
COGAN & ASSOCIATES
SWAN WOOSTER ENGINEERING INC.
FOR THE OREGON STATE LAND BOARD &
DIVISION OF LANDS
OPTION A
VIEWS
VIEWS
0
400
800

FIGURE 13


TONGUE POINT
HIGHEST AND BEST USE STUDY
DEVELOPMENT CONCEPT
5A SHORE-SIDE LOG STORAGE
WILLIAMS-KUEBELBECK & ASSOCIATES INC.
COGAN & ASSOCIATES
SWAN WOOSTER ENGINEERING INC.
FOR THE OREGON STATE LAND BOARD &
DIVISION OF LANDS
OPTION B

VI. EVALUATION OF ALTERNATIVE SCENARIOS

This chapter presents the consultant's evaluation of the alternative development scenarios described in the preceding chapter. It begins with a brief explanation of the criteria used in the evaluation and then proceeds with a discussion of findings and conclusions for each parcel.

A. CRITERIA FOR EVALUATION

Four major categories of criteria were used to evaluate the alternative scenarios for each site:[1/]

- Economic Considerations
- Site Suitability
- Land Use and Institutional Implications
- Environmental Impact

Within each major category, consideration was given to several factors that more specifically define the evaluation criteria. For example, Economic Considerations include market feasibility, employment opportunities, and economic "spillover" benefits. A complete listing of the criteria used in this evaluation is presented below:

Economic Considerations

- Market Feasibility
- Employment Opportunities
- Economic "Spillover" Benefits

Site Suitability

- Adequacy of Land Area
- Waterway Alterations and Ship Requirements
- Availability of Utilities
- Highway and Rail Requirements

[1/] Financial feasibility was not included as a criterion; it is the subject of a separate evaluation being prepared for the Division of State Lands.

Land Use and Industrial Implications

Consistency with Plans
Compatibility with Adjacent Uses
Likelihood of Public Support
Political Acceptability
Likelihood of Controversy
Ease of Implementation

Environmental Impact

Terrestrial Environment
Aquatic Environment

B. EVALUATION OF NORTH PARCEL SCENARIOS

Three scenarios were formulated for the north site: N1 - Coal Terminal, N2 - Three Berth Terminal, and N3 - Bulk Cargo Terminal (see Chapter V for descriptions). Our evaluation of these scenarios follows.

Economic Considerations

Market Feasibility - The market analysis conducted as part of this study concluded that during the projection period 1981-2000, there will be potential market support for each of the uses included in Scenarios N1, N2 and N3. Through 1990, demand is expected to be strongest for Scenario N2, particularly for facilities to handle logs and forest products.

The demand for grains and minerals is projected to generate a requirement for an additional 6 to 7 bulk grain berths and 2 bulk mineral berths in the Lower Columbia Region by the year 2000. The strength of demand for Scenario N3 (bulk grain and minerals) is contingent upon (a) the deepening of the Columbia River bar and channel to accommodate larger vessels and, to a somewhat lesser extent, (b) the upgrading of the Burlington Northern Railroad line between Portland and Tongue Point. Without the ability to handle larger vessels, Portland is likely to continue to be the preferred location for bulk grain terminals.

With regard to Scenario N1, it is estimated that by the year 2000 there will be demand for up to 65 million short tons per year of coal for export from the West Coast of the United States. Such demand will require 5 to 6 major coal export facilities. Tongue Point's potential to capture a share of that demand is dependent upon upgrading the railroad line from Portland. Tongue Point's competitive position would improve greatly if the Columbia River bar and channel are deepened to accommodate 100,000 DWT ships.

Employment Opportunities - Among the three scenarios, Scenario N2 would generate the largest number of direct permanent jobs, estimated at between 420 and 480 at full development (105-120 acres at 4 employees per acre). Permanent jobs created by Scenario N3 are estimated at 180 to 270 (60-90 acres at 3 employees per acre). A coal terminal (Scenario N1) would result in the fewest number of jobs, approximately 100 for a 10 million ton facility.

Economic "Spillover" Benefits - This criterion refers to the ability of each scenario to stimulate further economic development activity in the vicinity of Tongue Point and in Clatsop County. Such activity might take the form of demand for support industries such as suppliers, equipment maintenance firms, importers, trucking companies, etc. A coffee shop and/or restaurant/bar are other examples.

Of the three scenarios, Scenario N2 is likely to generate the greatest spillover benefits due to its mixed-use nature. In addition, because Scenario N2 would result in the largest number of jobs, it would also generate the largest payroll which, in turn, would generate higher retail sales and housing demand in the Astoria area.

Scenario N3 is expected to have fewer spillover benefits than Scenario N2 while Scenario N1 is likely to have the fewest benefits of this type.

Site Suitability

Adequacy of Land Area - By filling the area between the existing finger piers, sufficient land area can be created to accommodate each scenario. Spoils from channel dredging would be used to meet most of the fill requirement. Approximately 150 acres of land are potentially available.

Waterway Alterations and Ship Requirements - All three scenarios require the same waterway alterations. These include dredging a 40 foot access channel and a 25 foot turning basin. The maximum turning basin depth of 25 feet, as specified in the mediation agreement, impairs the site's suitability for Scenarios N1 and N3, as it precludes the turning of a fully or, in some cases, partially loaded vessel. This factor would be a concern to coal or bulk terminal operators and to vessel captains. However, it would not be a problem for Scenario N2, as container ships and log carriers are usually of shallower draft than bulk carriers.

Availability of Utilities - Water, sewer and power are all available. Sewer collector lines may require replacement/upgrading. The water requirement for a coal terminal (primarily sprinkling for dust control) would strain the city's water supply. Columbia River water may have to be used for this purpose.

Highway and Rail Requirements - U.S. 30 provides adequate highway access to the north parcel for all three scenarios. Truck traffic associated with Scenario N2's log and forest products terminals may require the upgrading of the connecting road that links the north parcel to U.S. 30.

Burlington Northern's single track line from Portland to Astoria will have to be upgraded for use by unit trains required by Scenarios N1 and N2, and desired for Scenario N3. Without unit train service to

Tongue Point, Scenario N3 could potentially receive bulk grains from Pacific Northwest origins via barge from the Upper Columbia and Snake Rivers. However, it would not be practical to transport Midwest grains to Tongue Point without unit train capability.

The presence of a single track rail line under the control of one company serves to impair the suitability of the site for coal (Scenario N1), mini-bridge containers (portion of Scenario N2), and Midwest grains (Scenario N3).

Land Use and Institutional Implications

Consistency with Plans - All three scenarios are consistent with the CREST sponsored mediation agreement. The city of Astoria is modifying its comprehensive plan and zoning code, the governing local land use documents, to reflect the agreement's provisions.

Compatibility with Adjacent Uses - This criteria is concerned with the compatibility of each scenario with the Job Corps facility immediately north, the federal wildlife refuge to the east and south, and residential uses west and southwest across U.S. Highway 30.

Any intense marine industrial development causes congestion, noise, and possible air pollution, and can be expected to have adverse impacts upon the Job Corps facility and the wildlife refuge, particularly at Mott and Lois Islands. Residential areas to the west and southwest are protected by vegetation and topography and will be less affected.

Air pollution emissions associated with the transportation and open storage of coal (scenario N1) and other bulk materials which will be handled in Scenario N3 are identifiable. Point (i.e. industrial) sources are regulated stringently by the state Department of Environmental Quality and federal Environmental Protection Agency. The most

potentially significant air pollution impacts could result from Scenario N2 development because it is the most labor-intense, and therefore would involve the most vehicular travel to and from the site. Oregon does not control vehicular emissions outside the major metropolitan areas.

Generally, all three scenarios for the north site are somewhat, and in some cases highly, compatible with the alternative uses at the south site. A coal terminal (N1) would not be consistent with Scenario S1 (barge/rail transshipment facility) because there is inadequate berthing space on the north portion to accommodate both uses.

Likelihood of Public Support - As indicated by extensive interviews with local citizens, community leaders, and elected officials, economic decline in Clatsop County is a growing concern. Therefore, any proposed development of north Tongue Point is likely to receive broad public support. However, the Port of Astoria faces a dilemma because while it supports economic recovery in general, it owns competing sites which it is marketing. This problem may be perceived locally as a port/state conflict because of the State Land Board ownership of Tongue Point.

Scenario N2, a three berth general cargo facility, would bring in the most jobs and economic diversification to the area. On the other hand, the potential for a coal export facility on the Lower Columbia River has been publicized widely and may have captured the imagination of both the public and some political leadership.

Air pollution associated with coal dust could be a source of controversy although, as noted above, it will be subject to stringent state and federal point source emission controls. Our interviews indicate that Tongue Point appears to be the least controversial site for such a facility because its location east of Astoria would eliminate the need

for unit trains to travel through the the city. However, residents of Clatskanie, St. Helens, Rainier, and other communities on the rail line are likely to protest this increase in freight and oppose the construction of a coal or other bulk commodity facility on the Lower Columbia.

Political Acceptability - Due to their concern about poor economic conditions and in recognition of the limited demand for Lower Columbia industrial land, local elected officials appear to welcome any industrial development at north Tongue Point. Although Scenario N2 would result in the most jobs in the short term, even the less labor-intensive N1 and N3 would fulfill another important local objective: that is, stimulate additional private investment.

Several influential state and national political leaders, including Governor Vic Atiyeh, Congressman Les AuCoin, and Senator Mark Hatfield, publicly advotace the construction of a coal export facility on the Lower Columbia. Their support is crucial to obtaining the economic development assistance and improvements to the main channel needed to facilitate development of the site. However, recent plans announced by the Ports of Kalama and Portland to construct coal ports demonstrate competition to an additional facility at Tongue Point.

Likelihood of Controversy - Generally, both citizens and government officials, including those who participated in the recent CREST mediation process, consider marine industrial development of the north site an appropriate use. The area is the site of an abandoned naval station and has been so altered that further development is unlikely to have additional adverse impact on nearby aquatic areas. Furthermore, its detached location from Astoria minimizes any potential disruption to community life.

Unless the costs of providing public services and development subsidies outweigh economic benefits, as illustrated by the controversy over the proposed Alumax plant several years ago, there is little likelihood of opposition to any of the three development proposals. The Clatsop County Environmental Council, which spearheaded opposition to Alumax, is inactive, and is unlikely to generate controversy over any development of north Tongue Point.

Ease of Implementation - Under the zone code modifications to the Astoria comprehensive plan, all three options would be conditional uses under the category "port facilities and/or shipping activities," subject to public hearing and possible imposition of special conditions. Furthermore, as all require extensive dredging and filling, the same time consuming but relatively straightforward state and federal permit process is required for each scenario.

Construction of a continuous wharf (Scenarios N2 and N3) would alter the aquatic environment more extensively and might require a more complex permit process. On the other hand, the developer of a coal port would have to obtain a state air contaminant discharge permit (ACDP). This is not likely to be required for the other uses.

The coal facility envisioned in N1, under the control of one developer/operator, would be most easily integrated into the existing institutional, marketing, and operational framework. Implementation of N3 is more complex because the infrastructure and number of employees necessary for several bulk commodity facilities would be greater. Operational responsibilities might include coordination of several owners/lessees, scheduling of berth space, collection of tariffs and other revenues, and maintenance of facilities. Similar in development intensity to N3, Scenario N2 further complicates operational coordination by involving three different marine terminal activities. Furthermore, as the most labor intensive option, this scenario requires the most extensive public facilities, thereby increasing the difficulty of coordinating public and private investments.

Environmental Impact

The following summary of environmental impacts was prepared by Beak Consultants Incorporated as input to the Tongue Point Coal Terminal Feasibility Study conducted by Swan Wooster Engineering, Inc. These impacts are identified in an environmental assessment report that evaluates the development of a coal terminal identical in size and concept to Scenario N1.[1/] Since such an assessment was outside the scope of this highest and best use study and since the environmental impacts of the three north parcel scenarios are expected to be very similar, it was deemed appropriate to include the summary of coal terminal impacts in this evaluation. It should be noted that the most significant environmental impacts would result from the dredging and filling common to each Scenario. In terms of impacts caused by ongoing operations, the coal terminal (Scenario N1) is expected to have the greatest impact due to dust emissions.

Terrestrial Environment

- Minor soils and vegetation disturbance will occur during construction of the return spun and trestle.
- Fugitive dust emissions will increase total suspended particulates of area.
- Construction and operation noise may displace eagle and waterbird activity in the area.

Aquatic Environment

- Removal of sediments to deepen access channel will remove or alter benthic habitat and possibly promote incursion of salt water into the embayment.
- Water quality of water adjacent to project may be affected during construction by quality of supernatant water leaving diked-in area.
- Loss of marsh vegetation (rooted aquatic plants) can be expected if a railroad trestle is constructed between Tongue Point North and Tongue Point South. Shading and physical

[1/] Beak Consultants Incorporated, Environmental Assessment Report, Tongue Point Coal Terminal, Oregon - Draft, September 21, 1981.

removal of plants will be responsible for the loss. Siltation from dredging could affect tidal marsh areas from the finger piers to the mouth of the John Day River.

- The project will remove approximately 80 acres of potentially productive benthic habitat. Dredging will temporarily reduce benthic invertebrate abundance through physical disturbance and through deposition of sediment on undisturbed benthic habitat. Long-term changes in benthic community structure are possible from propwash and currents in turning basin. More information is necessary on currents, sediment, and existing benthos before effects on density of the important amphipod Corophium can be fully assessed.

- Filling the finger pier area will remove approximately 80 acres of fish habitat from the estuary. The significance of this area as fish habitat has yet to be determined.

- Parts of the MARAD Basin and the area between Mott Island and Tongue Point are popular sites for sturgeon fishermen. Interference with the sport fishery is anticipated during the dredging of the access channel and turning basin.

- Removal of benthic invertebrate habitat and potential reduction in benthic organism abundance, especially Corophium, could have detrimental effects on juvenile chinook salmon and other juvenile fish that depend on the area for feeding and rearing. More data are needed to quantify those potential effects.

C. EVALUATION OF SOUTH PARCEL SCENARIOS

Four scenarios were identified for the south parcel: S1-Barge/Rail Transshipment Facility, S2-Overflow Facility, S3-General Industrial Development, and S4-Shoreside Log Storage (see Chapter V for descriptions). Our evaluation follows:

Economic Considerations

Market Feasibility - With the exception of Scenario S4 which represents the relocation of the present use of the north parcel, there is not likely to be sufficient market demand to support the uses under consideration for the south parcel. Scenarios S1 and S2 were envisioned as logical extensions of the north parcel Scenarios N1 and N3. However, for the following reasons, they cannot be supported:

- By filling the north parcel, it would be possible to receive barges and unit trains on-site. In addition, enough backup

land could be created at the north parcel to store the maximum amount of cargo that a three berth terminal could handle. In light of these conditions, there would not be a need for a barge/rail transshipment facility (Scenario S1) on the south parcel.

- Using the south parcel to provide backup acreage for the storage of cargoes moving through the north parcel (i.e. Scenario N2) appears to be injustifiable, given the potential availability of adequate land at the north parcel to meet the requirements of a three berth terminal. The only foreseeable use under Scenario N2 would be to accommodate an expansion phase for a coal terminal on the north parcel (1995+).

The market analysis revealed that demand for general industrial land (Scenario S3) is expected to be weak. Most demand of this type is likely to be generated by two sectors: seafood processing and forest products manufacturing. However, such demand is projected to be relatively small and can be met either at existing facilities or at other available sites.

Employment Opportunities - General industrial development (Scenario N3) customarily generates an average of 7-12 jobs per acre, depending upon the mix of uses. Scenarios S1 and S2 are relatively low intensity in terms of jobs (estimate 3-4 jobs per acre) while Scenario S4 is the lowest.

Economic "Spillover" Benefits - Such benefits would be (a) greatest from Scenario S3 with its potential for diversification and job creation and (b) smallest from Scenario S4 which is merely a continuation of an existing low intensity activity. Scenarios S1 and S2 are expected to have relatively few benefits of this type.

Site Suitability

Adequacy of Land Area - Sufficient land area is available to accommodate each scenario.

Waterway Alterations and Ship Requirements - Scenario S3 would not require any waterway alterations since it represents a non-water dependent use. Scenario S1 may require channel deepening although the present water depth of 18 feet should be adequate for barges. Scenarios S1 and S2 will require a vehicle trestle and conveyor system across the aquatic natural area for moving cargo to and from the north parcel.

Availability of Utilities - Sewer and power are available for all scenarios. Sewer collector lines may require replacement/upgrading. The city of Astoria, which provides water to the John Day Water District (supplier to Tongue Point) presently does not allow the sale of its water by other water districts for new industrial uses. This situation would have to be overcome in order to implement Scenarios S1, S2 and, particularly, S3.

Highway and Rail Requirements - U.S. 30 provides adequate highway access to the south parcel for all scenarios. Truck traffic associated with Scenarios S3 and S4 may require the upgrading of the connecting road that links the south parcel to U.S. 30.

Burlington Northern's single track line from Portland to Astoria will have to be upgraded for use by unit trains in Scenario S1.

Land Use and Institutional Implications

Consistency With Plans - All four scenarios are consistent with the mediation agreement which is being incorporated into the governing comprehensive plan.

Compatibility With Adjacent Uses - Scenario S1, the rail/barge transshipment facility, and to a lesser extent, S2, an overflow facility, require the most water-related improvements and therefore potentially the most impact on adjacent aquatic areas. Their feasibility depends on the use of the north site. S2 is compatible with all three north site alternatives; S1 is incompatible with the coal terminal proposed in N1, while compatible with N2 and N3.

As a low intensity activity requiring few employees, log storage envisioned in S4 is relatively environmentally benign and can function independently of development on the north site. Scenario S3, non-marine industrial development, also will have little adverse impace upon adjacent aquatic areas. However, because it is the most land and labor intensive, it could cause serious noise, congestion, and air pollution problems which may affect the wildlife refuge. It would not be affected by uses of the north portion.

Likelihood of Public Support - Scenarios S1, S2 or S3 can be expected to be broadly supported by the public because they appear to be "productive" in terms of long term stability, new job generation, and other economic benefits. The log storage facility envisioned in S4 probably is perceived as an interim use and may not be as popular.

Political Acceptability - Scenario S3 is least disruptive to adjacent aquatic areas and probably would engender the least resistance from environmentalists. However, it is the most labor intensive option and would require the most extensive public services and facilities. This could cause unwelcome noise, congestion, and air pollution. Of the three marine-related industrial scenarios, S1 is the most economically productive.

Likelihood of Controversy - Unlike the north parcel, the valuable aquatic habitats adjacent to south Tongue Point are vulnerable to disruption. The CREST mediation agreement permits the industrial activities envisioned in Scenarios S1, S2, and S4 if water-related improvements are designed carefully. Opposition to marine-related development of south Tongue Point on environmental grounds appears to have been blunted by the participation of state and national resource agencies in the mediation agreement. They have retained the right to review specific proposals. This further safeguards the environmental integrity of the area.

In addition, Scenarios S2, S3 and S4 would not involve the shipment of commodities by rail through the upstream communities of Clatskanie, St. Helens, Rainier, and others, and probably would engender little opposition from local residents. The transshipment facility envisioned in S1 requires either barge or barge/rail access, with the former having less impact upon upstream communities. In general, none of the proposed uses for the south site should generate significant controversy.

Ease of Implementation - From a regulatory point of view, S3 would be the easiest scenario to implement because its proposed uses are permitted outright in the Astoria zone code and no exceptions to statewide land use Goal 16, Estuarine Resources, is required. Development of the other options requires conditional use permits and exceptions to Goal 16. Scenario S1 requires the most water-related improvements especially if the construction of a rail loop is necessary.

From an institutional standpoint, S3 could be the most difficult to implement because it involves a large number of diverse activities on small sites, with attendant difficulty in marketing, public services, and operations. Similarly, S1 and S2 could involve several lessees and increase management complexity. Scenario S4 would likely involve a single user and require a minimum of infrastructure and employees, facilitating both development and management.

Environmental Impact

In light of its non-water orientation, Scenario S3 (general industrial development) would have very little adverse impact on surrounding aquatic areas. By comparison, Scenario S1's requirement for a barge dock and a trestle linking the north and south parcels would result in the most impact on the aquatic environment.

Beak Consultants Incorporated found that "loss of marsh vegetation (rooted aquatic plants) can be expected if a railroad trestle is constructed between Tongue Point North and Tongue Point South. Shading and physical removal of plants will be responsible for the loss. Siltation from dredging could affect tidal marsh areas from the finger piers to the mouth of the John Day River."[1/] These impacts would be associated with Scenarios S1 and S2.

The impact of Scenario S4, which would place log rafts in the aquatic conservation area, would be greater than S3 but less than S1 and S2.

D. CONCLUSIONS

North Parcel

Based upon the preceding evaluation, we have concluded that Scenario N2 (three berth terminal) is the most attractive of the three alternatives considered for the north parcel. Its uses are supported by the strongest near- and mid-term demand, it has the potential to generate the largest number of permanent direct jobs (420-480), it does not depend upon deepening the Columbia River bar and channel, and its environmental impacts would be no more significant than the other scenarios. The mixed use nature of N2's three berths and its employment generating potential also suggest that N2 would stimulate greater economic "spillover" benefits than either N1 or N3. On the basis of institutional and land use implications, there are no significant differences among the three scenarios.

[1/] Beak Consultants Incorporated, Op. Cit., p. 3-11.

Scenario N2's mini-bridge container facility would require upgrading of the Burlington Northern Railroad between Portland and Tongue Point. However, this same improvement is also a requirement for Scenario N1's coal facility and Scenario N3's Midwest grain component.

Factors serving to impair the feasibility of Scenario N2 include the presence of single carrier rather than competitive rail service and uncertainties regarding (a) future changes in federal log export policies and (b) future trends in Pacific Northwest forest production.

Scenarios N1 and N3 are both supported by market demand considerations. However, a coal terminal (N1) would be at a disadvantage vis-a-vis other potential Pacific Northwest ports due to rail distance and channel depth. To overcome this disadvantage, the Columbia River bar and channel would require deepening to handle vessels of 100,000 DWT, thereby reducing the transportation cost per ton to a level comparable with other prospective coal ports. The maximum turning basin depth of 25 feet, specified in the mediation agreement, impairs the site's suitability for a coal terminal. Finally, this scenario would generate far fewer jobs than Scenario N2 (approximately 100 compared to 420-480 for N2) and would be more costly ($93.3 million for N1 versus $54.9 million for N2[1/]).

Scenario N3 would also require deepening of the river channel in order to make the site competitive vis-a-vis Portland for the export of Midwest grains. As with Scenario N1, the 25 foot turning basin poses a problem for this scenario. The very strong demand anticipated for the grain exports (6-7 new berths in the Lower Columbia Region by the year 2000) bodes well for this scenario if the site's physical limitations (i.e. channel depth and rail conditions) can be removed. Development costs ($48.9 million) are the lowest of the three scenarios.

[1/] Costs exclude railroad upgrading.

In light of Scenario N3's advantages, consideration should be given to a "hybrid" scenario that incorporates a grain facility into the three berth terminal concept of Scenario N2.

South Parcel

Among the four major categories of evaluation criteria (economic considerations, site suitability, land use and institutional implications, and environmental impact), economic considerations are most decisive in determining the feasibility of the alternative scenarios. The market analysis revealed it is not likely that the south parcel will be required for a barge/rail transshipment facility (Scenario S1) because of the north site's ability to receive barges and unit trains and to provide sufficient backup land. The latter point (adequate backup land) is also the reason why an overflow facility (Scenario S2) is unlikely to be demanded. An exception would be to utilize the south parcel for the storage of different grades of coal and/or for a blending operation as an extension of a very large coal export facility on the north parcel. In terms of timing, the need for such a use on the south parcel would arise only after full utilization of the north site's 150 acres, estimated to occur not before 1995.

The demand for general industrial land, as envisioned in Scenario S3, was found to be relatively weak in the Clatsop County market area. In the absence of sufficient market demand, this scenario cannot be justified from an economic perspective. However, other criteria suggest the desirability of general industrial development on the south parcel. It can provide diversification, it has a relatively high employment density (jobs per acre), it does not require waterway alterations and, as a result, its impact on the aquatic environment would be minimal.

The fourth and last alternative considered for the south parcel, S4 - Shoreside Log Storage, appears to be the most feasible, at least in the near term. It represents a use similar to the current activity at the north parcel. It requires relatively few alterations to the land and

water area. However, it is also a very low intensity use, creates relatively few jobs, and would not generate very large rental revenues.

In light of the foregoing findings and conclusions, it is apparent that none of the four south parcel scenarios presents itself as a clear "best use." Scenario S4 could be a suitable interim use until such time as the south parcel is demanded either for general industrial development or to meet the expansion needs of a coal terminal on the north parcel. If Scenario N2 (three berth terminal) is implemented on the north parcel, then only Scenarios S3 or S4 would be feasible to consider on the south parcel.

A decision regarding the acquisition of the south parcel by the Division of State Lands (DSL) should be based upon a comprehensive evaluation of optional courses of action. One option presently under consideration by DSL is to trade land currently owned by the state for the south parcel. Such a trade may be beneficial to the state (i.e. the state could acquire a site with some revenue generating potential in exchange for one with no such potential). However, only a detailed evaluation will determine the level of financial feasibility and provide assurance that all options favorable to the state have been considered.

APPENDIX A

APPENDIX A

PERSONS INTERVIEWED BY COGAN & ASSOCIATES

Respondent/Title	Agency/Organization
Pat Amadeo, Administrative Assistant for Natural Resources;	Governor's Office
Dick Benner, Attorney	1,000 Friends of Oregon
Roger Berg, Member	Clatsop County Board of Commissioners
Robert Chopping, Mayor	City of Astoria
Gail Collins, Member	Clatsop County Environmental Council
Bob Cortwright, Coastal Representative	State Department of Land Conservation and Development
Mike DeLapa, Director	Columbia River Estuary Study Task Force (CREST)
Bud Forrester, Editor	Daily Astorian
Gene Hallaux, Planning Director	City of Astoria
Stan Hamilton, Assistant Director, Land and Mineral Resources	Division of State Lands (DSL)
Mike Morgan, Senior Planner	Clatsop-Tillamook Intergovernmental Council (CTIC)
Don Oswalt, CREST-Astoria Plan Reviewer	State Department of Land Conservation and Development
Fred Schaller, Chairman	Astoria Port Commission
Kurt Schneider, Planning Director	Clatsop County
Floyd Shelton, Executive Director	Port of Astoria

APPENDIX B

Table B-1

NET FUTURE FACILITY INCREASE - YEAR 2000

LOWER COLUMBIA REGION

Commodity	Volume Increase to Year 2000 (Short Tons)	less	Excess Capacity 1977 (Short Tons)	equals	Deficit or Volume Requiring New Facilities in 2000 (Short Tons)	divided by	Facility Capacity Per Berth	equals	Number of Berths 2000	Type
General Cargo										
Non Container	254,000		314,000		--		--		--	
Container	767,000		--		767,000		300,000		2.6	
Motor Vehicles	188,000		78,000		110,000		140,000		1.0	
Iron/Steel	832,000		65,000		767,000		200,000		4.0	
Forest Products (Excluding Logs)										
Astoria										
Non Container	273,000		300,000		--		--		--	
Container	547,000		--		547,000		300,000		2.0	Container
Portland										
Non Container	207,000		--		207,000		100,000		2.0	Lumber
Container	413,000		217,000		196,000		300,000		0.7	Container
Logs-Shoreside Loading										
Astoria	550,000		--		550,000		200,000[1/]		3.0	Shoreside
Portland	--		--		--		--			
Bulk Grains	7,356,000		885,000		6,471,000		1,500,000		4.3	Grain
Bulk Minerals	1,946,000		--		1,946,000		1,000,000		2.0	
Total									21.6	

[1/] Facility capacity might be as high as 550,000-600,000 short tons depending upon the speed of cargo transfer and the rate of berth turnover.

Source: Oregon Ports Study-1980; Williams-Kuebelbeck and Associates, Inc.

Table B-2

NET FUTURE FACILITY INCREASE - YEAR 1990

LOWER COLUMBIA REGION

Commodity	Volume Increase to Year 1990 (Short Tons)	less	Excess Capacity 1977 (Short Tons)	equals	Deficit or Volume Requiring New Facilities in 1990 (Short Tons)	plus	Facility Capacity Per Berth	divided by	Number of Berths 1990	Type
General Cargo	577,700									
Non Container	143,900		314,000		--		--		--	
Container	433,800		--		433,800		300,000		1.4	
Motor Vehicles	91,200		78,000		13,200		140,000		0.1	
Iron/Steel	360,500		65,000		295,500		200,000		1.5	
Forest Products (Excluding Logs)										
Astoria										
Non Container	154,300		300,000		--		--		--	
Container	309,200		--		309,200		300,000		1.0	Container
Portland										
Non Container	117,000		--		117,000		100,000		1.2	Lumber
Container	233,400		217,000		16,400		300,000		--	Container
Logs-Shoreside Loading										
Astoria	310,900		--		310,900		200,000[1/]		1.6	Shoreside
Portland	--		--		--		--		--	
Bulk Grains	3,266,200		855,000		2,381,200		1,500,000		1.6	Grain
Bulk Minerals	572,200		--		572,200		1,000,000		0.6	
Total									9.0	

[1/] Facility capacity may be as high as 550,000-600,000 short tons depending upon the speed of cargo transfer and the rate of berth turnover.

Source: Oregon Ports Study-1980; Williams-Kuebelbeck and Associates, Inc.

Table B-3

NET FUTURE FACILITY INCREASE - YEAR 1985

LOWER COLUMBIA REGION

Commodity	Volume Increase to Year 1985 (Short Tons)	less	Excess Capacity 1977 (Short Tons)	equals	Deficit or Volume Requiring New Facilities in 1985 (Short Tons)	divided by	Facility Capacity Per Berths	equals	Number of Berths 1985	Type
General Cargo										
Non Container	81,400		314,000		--		--		--	
Container	244,900		--		244,900		300,000		0.8	
Motor Vehicles	47,800		78,000		--		140,000		--	
Iron/Steel	179,600		65,000		114,600		200,000		0.6	
Forest Products (Excluding Logs)										
Astoria										
Non Container	87,200		300,000		--		--		--	
Container	174,700		--		190,300		300,000		0.6	Container
Portland										
Non Container	66,100		--		72,000		100,000		0.7	Lumber
Container	131,800		217,000		--		300,000		--	Container
Logs-Shoreside Loading										
Astoria	175,600		--		175,600		200,000[1/]		0.9	Shoreside
Portland	--		--		--		--		--	
Bulk Grain	1,644,000		855,000		905,800		1,500,000		0.5	Grain
Bulk Minerals	261,200		--		284,500		1,000,000		0.3	
Total									4.4	

1/ Facility capacity may be as high as 550,000-600,000 short tons depending upon the speed of cargo transfer and the rate of berth turnover.

Source: Oregon Ports Study-1980; Williams-Kuebelbeck and Associates, Inc.